

# UNIVERSITY CATALOG

2015-2016

UNIVERSITY  
OF WYOMING

# University Calendar 2015-16

2015							2016									
<b>May</b>							<b>January</b>									
S	M	T	W	R	F	S	S	M	T	W	R	F	S			
3	4	5	6	7	8	9						1	2			
10	11	12	13	14	15	16	3	4	5	6	7	8	9			
17	18	19	20	21	22	23	10	11	12	13	14	15	16			
24	25	26	27	28	29	30	17	18	19	20	21	22	23			
31							24	25	26	27	28	29	30			
							31									
<b>June</b>							<b>February</b>									
	1	2	3	4	5	6		1	2	3	4	5	6			
7	8	9	10	11	12	13	7	8	9	10	11	12	13			
14	15	16	17	18	19	20	14	15	16	17	18	19	20			
21	22	23	24	25	26	27	21	22	23	24	25	26	27			
28	29	30					28	29								
<b>July</b>							<b>March</b>									
			1	2	3	4				1	2	3	4	5		
5	6	7	8	9	10	11	6	7	8	9	10	11	12			
12	13	14	15	16	17	18	13	14	15	16	17	18	19			
19	20	21	22	23	24	25	20	21	22	23	24	25	26			
26	27	28	29	30	31		27	28	29	30	31					
<b>August</b>							<b>April</b>									
						1							1	2		
2	3	4	5	6	7	8	3	4	5	6	7	8	9			
9	10	11	12	13	14	15	10	11	12	13	14	15	16			
16	17	18	19	20	21	22	17	18	19	20	21	22	23			
23	24	25	26	27	28	29	24	25	26	27	28	29	30			
30	31															
<b>September</b>							<b>May</b>									
			1	2	3	4	5	1	2	3	4	5	6	7		
6	7	8	9	10	11	12	8	9	10	11	12	13	14			
13	14	15	16	17	18	19	15	16	17	18	19	20	21			
20	21	22	23	24	25	26	22	23	24	25	26	27	28			
27	28	29	30				29	30	31							
<b>October</b>							<b>June</b>									
				1	2	3				1	2	3	4			
4	5	6	7	8	9	10	5	6	7	8	9	10	11			
11	12	13	14	15	16	17	12	13	14	15	16	17	18			
18	19	20	21	22	23	24	19	20	21	22	23	24	25			
25	26	27	28	29	30	31	26	27	28	29	30					
<b>November</b>							<b>July</b>									
1	2	3	4	5	6	7							1	2		
8	9	10	11	12	13	14	3	4	5	6	7	8	9			
15	16	17	18	19	20	21	10	11	12	13	14	15	16			
22	23	24	25	26	27	28	17	18	19	20	21	22	23			
29	30						24	25	26	27	28	29	30			
<b>December</b>							<b>August</b>									
			1	2	3	4	5				1	2	3	4	5	6
6	7	8	9	10	11	12	7	8	9	10	11	12	13			
13	14	15	16	17	18	19	14	15	16	17	18	19	20			
20	21	22	23	24	25	26	21	22	23	24	25	26	27			
27	28	29	30	31			28	29	30	31						

**Fall 2015**

**August** 27 Residence halls open—7:00 a.m.  
31 Classes begin; Late registration and drop/add begins

**September** 3 Last day to add, late register, change grading options, drop or change sections for first-half block courses  
7 Labor Day (offices closed)  
10 Last day to add, late register, change grading options, drop or change sections in semester courses - strictly enforced  
10 Last day to make change to health insurance selection  
18 Tuition/Fees due, strictly enforced (see page 25)

**October** 2 Last day to withdraw from first-half block courses  
23 Midsemester  
28 Midterm grades must be submitted online by noon  
29 Last day to add, late register, change grading options, drop or change sections for second-half block courses

**November** 2-6 Advising week for Spring 2016  
4 Priority registration for Spring 2016 begins  
13 Last day to withdraw from individual semester courses  
25 Last day to withdraw from the university for Fall 2015  
25-27 Thanksgiving holiday (classes excused)

**December** 2 Last day to withdraw from second-half block courses  
11 Last day of classes  
14-18 Finals Week  
19 Residence halls close—12:00 p.m.  
4 Final grades must be submitted online by noon (1/4/16)

**January** 4 Final grades must be submitted online by noon (1/4/16)

**Spring 2016**

**January** 18 Martin Luther King Jr./Wyoming Equality Day (offices closed)  
22 Residence halls open - 8:00 a.m.  
25 Classes begin; late registration and drop/add begin  
28 Last day to add, late register, change grading options, drop or change sections for first-half block courses

**February** 1 Registration for Summer 2016 main campus courses begins  
3 Last day to add, late register, change grading options, drop or change sections in semester courses - strictly enforced  
3 Last day to make change to health insurance selection  
12 Tuition/Fees due, strictly enforced (see page 25)  
26 Last day to withdraw from first-half block courses

**March** 11 Midsemester  
14-18 Spring break  
23 Midterm grades must be submitted online by noon  
24 Last day to add, late register, change grading options, drop or change sections for second-half block courses

**March/April** 28-1 Advising week for Fall 2016

**March** 30 Priority registration for Fall 2016 begins

**April** 7 Last day to withdraw from individual courses  
22 Last day to withdraw from second-half block courses  
22 Last day to withdraw from the university for spring 2016

**May** 6 Last day of classes  
9-13 Finals Week  
14 Commencement  
14 Residence halls close—12:00 p.m.  
19 Final grades must be submitted online by noon

**Notes:**

(1) Refer to the *Class Schedule* for information on registration.

(2) Subject to change on not less than 30 days' notice unless an actual emergency arises, in which event the administration may exercise its option to make any change without notice.

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## University Catalogs Available

*University Catalog*—Online only

*Law School Bulletin*—College of Law, Dept. 3035—(307) 766-6416

*Summer Bulletin*—Online only

(All addresses: 1000 E. University Avenue, Laramie, WY 82071)

*University of Wyoming World-Wide Web address: [www.uwyo.edu](http://www.uwyo.edu)*

The University of Wyoming is built upon a strong foundation of integrity, respect and trust. All members of the university community have a responsibility to be honest and the right to expect honesty from others. Any form of academic dishonesty is unacceptable to our community and will not be tolerated.

The University of Wyoming is an affirmative action/equal opportunity employer and institution and does not discriminate on the basis of race, sex, creed, color, age, national origin, individual handicap, or veteran status in any aspect of employment or services. The institution's educational programs, activities, and services offered to students and/or employees are administered on a nondiscriminatory basis subject to the provisions of all civil rights laws and statutes. Evidence of practices that are not consistent with this policy should be reported to the Employment Practices Officer, 766-3459.

# Administration

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<i>Term</i>		<i>Year</i>
<i>Appointed/Reappointed</i>		<i>Expires</i>
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2013	Larry Gubbels, Douglas	2019
2011	John MacPherson, Saratoga	2017
2011	Jeff Marsh, Torrington	2017
2015	Dick Scarlett, Wilson	2021
2005/2011	Dave Palmerlee, Buffalo	2017
2013	Wava Tully, Lusk	2019
2013	Dave True, Casper	2019
2015	Mike Massie, Laramie	2017
2015	John McKinley, Cheyenne	2021
2015	Michelle Sullivan, Sheridan	2021
2015	Mel Baldwin, Star Valley	2021

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 Hertanto Adidharma ... Interim Head, Chemical & Petroleum Engineering  
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 Tim Robinson. .... Director, WWAMI Medical Education Program

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Outreach Credit Programs

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**Outreach School**

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Linda Day . . . . . Torrington  
Amy McClure . . . . . Riverton, Jackson  
Beverly Bell. . . . . Powell, Cody  
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**Maggie Farrell** . . . . . **Dean, University Libraries**

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Mark Northam . . . . . Director, School of Energy Resources  
Tay Johannes, Lt. Col. . . . . Head, U.S. Air Force ROTC  
Mitch Day, Lt. Col. . . . . Head, U.S. Army ROTC  
Susan Aronstein . . . . . Director, Honors Program  
Cathy Corbett . . . . . Interim Co-Director, John P. Ellbogen Center for  
Teaching and Learning  
Meg Van Baalen-Wood. . . Interim Co-Director, John P. Ellbogen Center for  
Teaching and Learning  
Rob Hurless. . . . . Interim Director, Institute for Energy Research and  
Director, Enhanced Oil Recovery Institute  
Mark Greene. . . . . Director, American Heritage Center  
Susan Moldenhauer . . . . . Director, Art Museum

For a complete list of all faculty and staff and their contact information, please see the *UW Campus Directory* or the UW Web site at [www.unyo.edu](http://www.unyo.edu).

# Mission Statement

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The University of Wyoming aspires to be one of the nation's finest public land-grant research universities. We serve as a statewide resource for accessible and affordable higher education of the highest quality; rigorous scholarship; technology transfer; economic and community development; and responsible stewardship of our cultural, historical, and natural resources.

In the exercise of our primary mission to promote learning, we seek to provide academic and co-curricular opportunities that will:

- Expose students to the frontiers of scholarship and creative activity and the complexities of an interdependent world;
- Ensure individual interactions among students, faculty, and staff;

- Nurture an environment that values and manifests diversity, free expression, academic freedom, personal integrity, and mutual respect; and
- Promote opportunities for personal growth, physical health, athletic competition, and leadership development for all members of the University community.

As Wyoming's only university, we are committed to outreach and service that extend our human talent and technological capacity to serve the people in our communities, our state, the nation, and the world.

The primary vehicles for identifying the specific actions and resource allocations needed to accomplish this complex mission are the University's strategic plans, revised periodically.

## University of Wyoming Non-Discrimination Statement

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The University is committed to equal opportunity for all persons in all facets of the University's operations. The University's policy has been, and will continue to be, one of nondiscrimination, offering equal opportunity to all employees and applicants for employment on the basis of their demonstrated ability and competence without regard to such matters as race, sex, gender, color, religions, national origin, disability, age, veteran status, sexual orientation, genetic information, political belief, or other status protected by state and federal statutes or University Regulations. It shall also be the policy of the University to utilize an affirmative action approach in the recruiting, hiring and promotion of women, people of color and other persons from designated groups covered by federal statutes, executive orders and implementing regulations in order to achieve a diverse workforce and student body.

For more information please see UW Regulation 1-3 (Equal Employment Opportunity/Diversity Program).

## University Communication Statement

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The University of Wyoming assigned email account shall be one of the official means of communication with all students, faculty, and staff. All community members are responsible for all information sent to them via their University assigned email account. Members who choose to manually forward mail from their University email accounts are responsible for ensuring that all information, including attachments, is transmitted in its entirety to the preferred account.

All faculty, staff, and students are required to maintain an @uwyo.edu computer account. This account provides both an online identification key and a University official email address. The University sends much of its correspondence solely through email. This includes,

but is not limited to, policy announcements, emergency notices, meeting and event notifications, course syllabi and requirements, and correspondence between faculty, staff, and students. Such correspondence is mailed only to the University official email address.

Faculty, staff, and students are expected to check their email on a frequent and consistent basis in order to stay current with University-related communications.

Faculty, staff, and students have the responsibility to recognize that certain communications may be time-critical.

# University Accreditation/Membership

The University of Wyoming, and all UW academic programs are accredited by The Higher Learning Commission, a commission of the North Central Association of Colleges and Schools Commission on Institutions of Higher Education, 230 South LaSalle Street, Suite 7-500, Chicago, IL 60604 or (800) 621-7440.

In addition, many individual academic programs are either approved, accredited or hold membership as indicated below.

## Recognized or accredited by:

- ABET (formerly known as Accreditation Board for Engineering and Technology)
- Accreditation Council for Graduate Medical Education
- Accreditation Council for Pharmacy Education
- American Alliance of Museums
- American Association of Professional Landmen
- American Association of Vet Lab Diagnosticians
- American Bar Association
- American Chemical Society
- American Dental Association
- American Psychological Association
- Association of American Law Schools
- Association to Advance Collegiate Schools of Business - International
- Commission on Accreditation for Dietetics Education
- Commission on Collegiate Nursing Education
- Computer Science Accreditation Commission (a participating body of ABET)
- Council for Accreditation of Counseling and Related Educational Programs
- Council on Academic Accreditation in Audiology and Speech Language Pathology
- Council on Social Work Education
- National Association of Schools of Music
- National Council for Accreditation of Teacher Education
- Newberry Consortium for American Indian Studies
- Society for Range Management
- Wyoming Professional Teaching Standards Board

## Holds membership in:

- American Association of Colleges of Teacher Education
- American Association of University Women
- American Council on Education
- American Society for Engineering Education
- Association for the Advancement of International Education
- Association of Academic Survey Research Organizations
- Association of American Colleges and Universities
- Council for the Advancement and Support of Education
- Council of Academic Deans from Research Education Institutions
- Council of Colleges of Arts and Sciences
- Council of Graduate Schools
- Justice Research and Statistics Association
- Greater Western Library Alliance
- Associate of Public and Land Grant Universities
- National Network for Educational Renewal
- University Professional and Continuing Education Association
- Western Cooperative for Educational Technology
- Western Interstate Commission for Higher Education

## Institution Articulation Agreements:

- NOLS - National Outdoor Leadership School
- Pikes Peak Community College, Colorado Community College Commission
- Teton Science School
- Wyoming Community Colleges

Memberships are also held in various discipline-related organizations. For more information, contact the appropriate department.

For information regarding accreditation/membership, contact the Office of Academic Affairs.

The University of Wyoming is a member of, and active participant in, the National Commission on Accrediting, an organization which endeavors to coordinate all accrediting activities.

## Assessment of Student Learning at the University of Wyoming

The University of Wyoming is committed to providing students with high quality academic programs and services. As a result, UW is actively engaged in several processes to assess student learning with the ultimate goal of continuous improvement. A university wide assessment plan and individual department plans are in various stages of implementation. The purpose of these plans is to identify and articulate student learning outcomes – the skills, abilities, and knowledge that students are expected to acquire by the completion of their programs – and the means by which these outcomes would be measured. Learning is assessed at the university, college and departmental levels. Current assessment activities include, but are not limited to, surveys, interviews,

portfolios, exams and senior capstone projects. In order for UW's assessment efforts to be successful, students must become engaged in the process. As such, students are expected and/or required to complete various assessments as determined by the university or department prior to the awarding of degrees.

For more information regarding the student learning outcomes for a particular program of study, see the section on College and Division Programs. For further information about the University of Wyoming's assessment of student learning efforts, see the Assessment of Student Learning webpage at [www.uwyo.edu/assessment](http://www.uwyo.edu/assessment).



# FERPA

## Family Educational Rights and Privacy Act (PL-380)

### General Statement

The University of Wyoming has the responsibility for effectively supervising any access to and/or release of official data/information related to the education records of its students. Certain items of information about individual students are fundamental to the educational process and must be recorded. This recorded information concerning students must be used only for clearly-defined purposes, must be safeguarded and controlled to avoid violations of personal privacy, and must be appropriately disposed of when the justification for its collection and retention no longer exists.

In this regard, the university is committed to protecting, to the maximum extent possible, the right of privacy of all individuals about whom it holds information, records, and files. Access to, and release of, such records is restricted to the student concerned, to parents of dependent students, to others with the student's written consent, to officials within the university, to a court of competent jurisdiction, and otherwise pursuant to law.

### Access

All official information collected and maintained in the university identifiable with an individual student will be made available for inspection and review at the written request of that student subject to certain exceptions.

For purposes of access to records at the University of Wyoming, students enrolled (or formerly enrolled) for academic credit or audit at the university shall have access to official records concerning themselves.

A request for general access to all official records, files, and data maintained by the university must be made in writing to the registrar or to other person(s) as designated by the university officer in charge of the unit maintaining records. A request for access to official data maintained in a particular office may be made to the administrative head of the office.

When students (or former students) appear at a given office and request access to the university record about themselves:

1. The student must provide proper identification verifying that he or she is the person whose record is being accessed.
2. The designated staff person(s) must supervise the review of the contents of the record with the student.
3. Inspection and review shall be permitted within a period not to exceed 45 days from the date of the student's request.
4. Students will be free to make notes concerning the contents, but no material will be removed from the record at the time.

Recordkeeping personnel and members of the faculty and staff with administrative assignment may have access to records and files for internal educational purposes as well as for routine necessary clerical, administrative, and statistical purposes as required by the duties of their jobs. The name and position of the official responsible for the maintenance of each type of education record may be obtained from the registrar of the university.

Any other access allowed by law must be recorded showing the legitimate educational or other purpose and the signature of the person gaining access. The student concerned shall be entitled to review this information.

### Release of Information

No personally identifiable information shall be disclosed to any individual (including parents, spouse, or other students) or organization except as follows:

1. Disclosure is authorized in writing by the student.
2. Disclosure is to university officers or employees who need to know so as to accomplish legitimate university purposes related to their functions.
3. Disclosure is to a governmental agency, educational organization, parent of a dependent student, or other entity as described by federal regulations or otherwise required by state or federal law. Custodians of records should obtain interpretations whenever third parties request personally identifiable information.
4. To authorized educational authorities at the local, state, and federal level.
5. When disclosure of any personally identifiable data/information from university records about a student is demanded pursuant to court order or lawfully issued subpoena, the staff member receiving such order shall, if possible, immediately notify the student concerned in writing prior to compliance with such order or subpoena. (NOTE: In fulfillment of its responsibilities to monitor certain state benefit and entitlement programs, the Wyoming state auditor may issue to the university from time to time an administrative subpoena for a listing of currently enrolled full-time students, the students' social security numbers, and information relating to the nature and amount of any educational financial aid being received by such students. Upon being served with such a subpoena, the university will provide the information requested without further notice.)
6. Data/information from university records about students will be released for approved research purposes only if the identity of the student involved is fully protected, or if the research is related to official university business and not publicly disseminated.
7. Information from university records may be released to appropriate persons in connection with an emergency if the knowledge of such information is necessary to protect the health or safety of a student or other persons.

The university officer responsible for the records from which information is released shall maintain with the student's record a listing of disclosures of personally identifiable information, except disclosures in accordance with items 1 and 2 above for which no record need be kept. The listing shall identify the parties who requested or obtained information and the legitimate interests these parties had in making the request.

## **Public or Directory Information**

The following items are considered public data/information and may be disclosed by the university in response to inquiries concerning individual students, whether the inquiries are in person, in writing, or over the telephone:

1. Name;
2. Affirmation of whether currently enrolled;
3. Campus location.

Unless students have officially filed a written request with the university registrar within ten working days after the first day of classes for a semester that disclosure not be made without their written permission, the following items, in addition to those above, are considered public/directory information; may be included in appropriate university/campus directories and publications; and may be disclosed by designated staff members in response to inquiries concerning individual students, whether the inquiries are in person, in writing, or over the telephone:

1. School, college, department, major, or division;
2. Dates of enrollment;
3. Degrees received;
4. Honors received;
5. Local address and phone number;
6. Home address (permanent);
7. Email address;
8. Participation in officially recognized activities and sports;
9. Weight and height of members of athletic teams;
10. Full-time or part-time enrollment.

## **Letters of Appraisal/Recommendation**

Candid appraisals and evaluations of performance and potential are an essential part of the educational process. Clearly, the providing of such information to prospective employers, to other educational institutions, or to other legitimately concerned outside individuals and agencies is necessary and in the interest of the particular student.

Data/information which was part of university records prior to January 1, 1975 and which was collected and maintained as confidential information will not be disclosed to students. Should a student desire access to a confidential letter of appraisal received prior to January 1, 1975, the student shall be advised to have the writer of that appraisal notify, in writing, the concerned records custodian of the decision as to whether or not the writer is willing to have the appraisal made available for the student's review. Unless a written response is received approving a change of status in the letter, the treatment of the letter as a confidential document shall continue.

Documents of appraisal relating to students and collected by the university or any department or office of the university on or after January 1, 1975, will be maintained confidentially only if a waiver of the right of access has been executed by the student. In the absence of such a waiver, all such documents will be available for the student's inspection and review.

If a student files a written waiver with the department or office concerned, letters of appraisal received pursuant to that waiver will be maintained confidentially. Forms will be available for this purpose.

## **Challenges to the Record**

All students shall have the opportunity to challenge any item in their file which they consider to be inaccurate, misleading, or otherwise inappropriate. A student shall initiate a challenge by submitting a request in writing for the deletion or correction of the particular item. The request shall be made to the custodian of the particular record in question.

If the custodian and the student involved are unable to resolve the matter to the satisfaction of both parties, the written request for deletion or correction shall be submitted by the student to such person as designated by the president of the university who shall serve as the hearing officer. The student shall be given the opportunity for a hearing at which the student may present oral or written justification for the request for deletion or correction. The hearing officer may obtain such other information as he or she deems appropriate for use in the hearing and shall give the student a written decision on the matter within 30 days from the conclusion of the hearing. If the decision of the hearing officer is to deny the deletion or correction of an item in the student's file, the student shall be entitled to submit a written statement presenting the student's position with regard to the item to the hearing officer. Both the written decision of the hearing officer and the statement submitted by the student shall be inserted in the student's file. The decision of the hearing officer shall be final.

Grades may be challenged under this procedure only on the basis of the accuracy of their transcription or posting.

## **Exception to the Policy**

It is the position of the university that certain data/information maintained in various offices of the university is not subject to the provisions of this policy with regard to inspection, review, challenge, correction, or deletion. Exceptions to "education records" include: alumni records, employment records, law enforcement records, medical records, sole possession records, and university disciplinary records.

1. Statements submitted by parent(s)/guardian or spouse in support of financial aid or residency determinations are considered to be confidential between those persons and the university and are not subject to the provisions of this policy except with the written consent of the persons involved. Such documents are not regarded as part of the student's official record.
2. University employment records of students are not included in this policy, except as provided under the Wyoming Public Records Act.
3. With regard to general health data, only that data/information which is used by the university in making a decision regarding the student's status is subject to review by the student under this policy. Written psychiatric or psychological case notes which form the basis for diagnoses, recommendations, or treatment plans remain privileged information not accessible to the student. Such case notes are not considered to be part of official university records. To ensure the availability of correct and helpful interpretations of any psychological test scores, notes, or other evaluative or medical materials, the contents of these files for an individual student may be reviewed by that student only in consultation with a professional staff member of the specific department involved. Records that are subject to FERPA are not subject to the HIPAA Privacy Rule.

4. Records relating to a continuing or active criminal investigation by the University of Wyoming Police Department, or records of said office not relating to the student's status with the university, are not subject to this policy.
5. No student is entitled to see information or records that pertain to another student, to parents, or to other third parties. A student is entitled to review only that portion of an official record or file that pertains to him or her.
6. The personal files, or sole possession records, of members of the faculty and staff which concern students, including private correspondence, and notes which refer to students, are not regarded as official records of the university. This includes notes intended for the personal use of the faculty and never intended to be official records of the university. In order to be sole possession records, they cannot be shared with anyone else.

### **Release of Personally Identifiable Information in a Deceased Student's Education Record**

The Family Educational Rights and Privacy Act (FERPA)'s protection of personally identifiable information in a student's education record ends at the time of a student's death. The University of Wyoming's policy on the release of a deceased student's records is as follows:

Within the first year following the death of a student, the University will release the educational records of the decedent to the following individuals:

- If the student submitted a signed Authorization to Release Educational Records form which designated the person(s) eligible to request and/or receive educational records, the information will be released to the individual on that form.
- The decedent's next of Kin. The request must be accompanied by official documentation.

- The individual designated as the personal representative of the decedent's estate. The request must be accompanied by official documentation.
- Members of the family or other persons with the written approval from the decedent's next of kin or the personal representative of the decedent's estate. Absent written approval from the family or representative of the estate, only directory information will be disclosed.
- In response to a subpoena or court order.
- To any other individual, if determined by the University to be in the best interest of the decedent or the University.

After one year has elapsed following the death of an individual student, the University may release the educational records of the decedent at the University's discretion.

### **Rights of Students**

Students are hereby notified that controlling provisions of federal law are contained in Sec. 438, Pub. L.90-247, Title IV, as amended, 88 Stat. 571-574 (U.S.C. 1232g) and regulations set forth in the code of Federal Regulations, 34 C.F.R. sections 99.1 to 99.67 (1981). Complaints of institutional noncompliance may be made to the Department of Education as provided in the regulations.

# Honor Societies and Programs

## All Academic Disciplines

Phi Beta Kappa has been one of the most respected societies in the world for more than 200 years. Phi Beta Kappa was founded in 1776 at the College of William and Mary, Virginia. Within a decade, chapters arose at Yale, Harvard, and Dartmouth. The Wyoming chapter received its charter in 1940, and today fewer than 270 colleges and universities in the United States meet the strict qualifications for housing a chapter. UW faculty and administrators annually elect to membership fewer than one-tenth of the leading scholars of the senior class, candidates for the degrees of Bachelor of Arts and Bachelor of Science. In exceptional cases a junior may be elected. In addition to having a distinguished academic record, a student eligible for Phi Beta Kappa must pursue a balanced and broad course of study, which includes a foreign language as well as courses in math, the sciences, and the humanities. At least 90 hours of the student's course work must be in the liberal arts and sciences. Students are reviewed for eligibility and are notified by mail the spring of their election. Phi Beta Kappa promotes the ideal of a community of scholarship, and every year the Chapter sponsors an eminent visiting lecturer for the entire university.

The national honor society of Phi Kappa Phi, founded in 1897, recognizes and encourages superior scholarship in all curricula of the colleges and divisions of the university. No other honor society has higher academic standards for admission. Good character is also an essential supporting attribute for those scholars elected to membership. The University of Wyoming chapter of Phi Kappa Phi sets minimum cumulative grade point requirements at 3.5 for seniors, 3.8 for juniors and 3.9 for graduate students. In addition, there are minimum requirements in terms of hours completed at UW. Since the chapter may initiate no more than ten percent of the number of seniors in each college, the actual grade point cutoff is often higher than these minimums. In the spring of each year, students' records are reviewed and letters of invitation are sent to those eligible for election to the society. Supplementing the work of its chapter, the national society awards fellowships for graduate study.

## College of Agriculture and Natural Resources

**Agriculture majors** - *Alpha Zeta* is a national honorary for students in agriculture who demonstrate academic excellence, character and leadership. Applications for membership are sent to eligible students. *Gamma Sigma Delta* is a national honor society open to students in agriculture. Potential members are invited to membership based upon academic excellence. *Phi Upsilon Omicron* is a national honor society in family and consumer sciences. Potential members are invited to membership based on academic excellence and leadership.

## College of Arts and Sciences

**Art** - A *Bachelor of Fine Arts* in art is considered honorary.

**Botany** - This *Honors Program* is for students majoring in botany or biology with strong interests in botanical science and independent research. Application to the botany department may be made after completion of the sophomore year with a cumulative grade point average of 3.3.

**Chemistry** - *American Chemical Society* - The Department of Chemistry is closely associated with the Local Wyoming Chapter of the American Chemical Society. The American Chemical Society (ACS) is one of the largest scientific societies in the world - its purpose is to promote chemistry and educate the public on the impacts of the chemical profession on the economy, technology, and education. The ACS organizes both national and regional scientific meetings; our local section supports student travel to these meetings. The chemistry department also sponsors a Student Affiliates section of the ACS, which is mentored by a UW chemistry faculty member and serves the needs of our chemistry majors.

**Communication** - *Lambda Pi Eta* recognizes, fosters, and rewards outstanding scholastic achievement while stimulating interest in the communication discipline.

**Criminal Justice** - *Alpha Phi Sigma - Epsilon Omega Chapter*, criminal justice honorary. A national honorary society for Criminal Justice that recognizes the academic excellence of Criminal Justice students. Alpha Phi Sigma is a collaboration with the Academy of Criminal Justice Sciences.

**English** - *English Honors Program* enables junior and senior English majors who carry a grade point average of 3.5 or better in their English courses to intensify and enhance their studies by working closely with a supervising faculty member to develop a senior honors project, a major piece of writing on a literary topic. *Sigma Tau Delta - Alpha Mu Omicron Chapter*, international English honor society.

**Gender and Women's Studies** - *National Women's Studies Association*; one of its primary objectives promoting and supporting the production and dissemination of knowledge about women and gender through teaching, learning, research and service in academic and other settings.

**Geography** - *Gamma Theta Upsilon - Eta Eta Chapter* candidates must have completed three semesters of college coursework and three courses in Geography, with a grade point average of 3.0 or higher for these courses. Contact department for more information.

**Geology** - Eligible students are Bachelor of Science degree holders with honors, majoring in geology or geophysics. They must meet an overall grade point average of 3.2, a grade point average of 3.2 in the major, and successful completion of an independent research project. Contact department for details.

**Global and Area Studies** - *Sigma Iota Rho*, national honorary. Membership in Sigma Iota Rho is intended not only to enhance the credentials of its members, though public recognition of the best and the brightest students in international studies is one of our main purposes, but is meant to encourage a life-long devotion to a better understanding of the world we live in and to continuing support for and engagement in education, service, and occupational activities that reflect the mission of Sigma Iota Rho. In that way we do not limit ourselves to once-a-year pats on the back during the induction of new members, but internalize the belief that our purpose for studying international affairs is not only to position ourselves to succeed in a globalized society, but to make the world we live in a better place through our contributions in our work and day-to-day life.

**History** - *Phi Alpha Theta*

**Journalism** - *Society of Professional Journalists, Sigma Delta Chi*

**Languages** - *Alpha of Wyoming Chapter of Sigma Delta Pi* - To honor those who attain excellence in the study of the Spanish language and in the study of the literature and culture of the Spanish-speaking peoples; to honor those who have made the Hispanic contributions to modern culture better known in the English-speaking world; to encourage college and university students to acquire a greater interest in and a deeper understanding of Hispanic culture; to foster friendly relations and mutual respect between the nations of Hispanic speech and those of English speech; to serve its membership in ways which will contribute to the attainment of the goals and ideals of the society.

**Music** - *Presser Award* is conferred by vote of the department faculty for outstanding senior in music. *Pi Kappa Lambda*, selected by faculty on the basis of outstanding scholarship and musical accomplishments.

**Physics and Astronomy** - *Sigma Pi Sigma; American Physical Society (APS)* The American Physical Society ([www.aps.org](http://www.aps.org)) is a non-profit membership organization working to advance and diffuse the knowledge of physics through its outstanding research journals, scientific meetings, and education, outreach, advocacy and international activities. APS represents over 50,000 members, including physicists in academia, national laboratories and industry in the United States and throughout the world. Society offices are located in College Park, MD (Headquarters), Ridge, NY, and Washington, DC. *American Astronomical Society (AAS)* The American Astronomical Society ([aas.org](http://aas.org)) is the major organization of professional astronomers in North America. The mission of the American Astronomical Society is to enhance and share humanity's scientific understanding of the universe.

**Political Science** - *Pi Sigma Alpha, Epsilon Beta Chapter* "to stimulate scholarship and intelligent interest in political science." The society functions at the national level, sponsoring programs and events of value to the profession and teaching of political science, and at the chapter level. Each chapter is encouraged to provide a framework for enriching the exposure of its members and the wider university community to the study of government and issues of public concern.

*Pi Alpha Alpha*, national public administration honorary. The purpose of Pi Alpha Alpha is to encourage and recognize outstanding scholarship and accomplishment in public affairs and administration. Its objectives, such as fostering integrity, professionalism, and effective performance, promote the advancement of quality in the education and practice of the art and science of public affairs and administration. PAA membership identifies those with the highest performance levels in educational programs preparing them for public service careers.

**Psychology** - *Psi Chi* - The Psychology Department supports a chapter of Psi Chi, the International Honor Society in Psychology. This local Psi Chi group functions within a larger Psychology Club that serves undergraduates interested in Psychology. The chapter and club are jointly involved in many activities, including community service projects, peer advising and graduation festivities.

**Sociology** - *Alpha Kappa Delta*, the international honorary society for sociology. In addition, sociology majors with a 3.2 overall GPA, a 3.5 GPA in sociology courses and two 5000-level sociology classes graduate with honors in sociology.

## College of Business

**Accounting** - *Beta Alpha Psi, Delta Alpha Chapter*, is the UW chapter of the national accounting honorary. Membership in this very active student honorary is awarded only to the very best accounting students.

**Business Administration** - *Beta Gamma Sigma* is the national scholastic honor society. It is the arm of the accrediting group, AACSB International. Membership is very selective and based on class rank and grade point average.

## College of Education

*Kappa Delta Pi - Alpha Mu Chapter* is the university chapter of the international honor society in education. The purpose of the society is to promote excellence in and recognize outstanding contributions to education. Invitation for membership is extended to those persons who exhibit commendable professional qualities, worthy educational ideals and sound scholarship.

*Mu Nu Tau Chapter of Chi Sigma Iota* is a Counseling Academic and Professional Honor Society International for counselors-in-training, counselor educators, and professional counselors. The mission of Chi Sigma Iota is to promote scholarship, research, professionalism, leadership, and excellence in counseling, and to recognize high attainment in the pursuit of academic and clinical excellence in the field of counseling. The CSI International homepage can be found at [www.csi-net.org/index.cfm](http://www.csi-net.org/index.cfm). The local chapter, Mu Nu Tau, encourages the furtherance of high standards of scholarship and professional practice through study groups, speaker programs, workshops, colloquia awards, social activities, and networking opportunities.

## College of Engineering and Applied Science

**Engineering majors** - *Tau Beta Pi* is a national honor society for all engineering majors. The purposes of the society are to honor outstanding student scholarship and to provide a spirit of liberal culture in the College of Engineering and Applied Science. Membership is offered to outstanding junior, senior and graduate engineering students of high scholastic ability and exemplary character.

## College of Health Sciences

**Kinesiology** - *Phi Epsilon Kappa* is a national professional fraternity dedicated to enhancing education, promotion of student research, community outreach, and professional development for persons pursuing careers in health, physical education, recreation, and other related fields.

**Nursing** - *Sigma Theta Tau* - academic leadership honorary. The mission of the Honor Society of Nursing, Sigma Theta Tau International is advancing world health and celebrating nursing excellence in scholarship, leadership, and service.

**Pharmacy** - *Rho Chi Society*, Academic Honorary. The Rho Chi Society encourages and recognizes excellence in intellectual achievement and advocates critical inquiry in all aspects of pharmacy. The Society further encourages high standards of conduct and character and fosters fellowship among its members; *Phi Lambda Sigma*, Pharmacy Leadership Society - to support pharmacy leadership commitment by recognizing leaders and fostering leadership development.

**Social Work** - *Phi Alpha* - academic honorary. The purpose of Phi Alpha Honor Society is to provide a closer bond among students of social work and promote humanitarian goals and ideals. Phi Alpha fosters high standards of education for social workers and invites into membership those who have attained excellence in scholarship and achievement in social work.

*Alpha Epsilon Delta* - Preprofessional honorary for those interested in health care careers.

## University Honors Program

*The National Collegiate Honors Council* and *The Western Regional Honors Council* provide recognition for students, faculty, and administrators in the area of academic achievement, civic responsibility, and personal development.

## College of Law

Law majors - *Order of the Coif* is an honorary society which recognizes legal scholastic excellence. Each year, the chapter may initiate into membership those students who graduate in the highest ten percent of their class.

## Outreach

University of Wyoming at Casper - *The Round Table Honor Society* - Open to UWC undergraduate students in all colleges with a 3.3 or higher GPA. Recognizes scholastic achievement and provides an opportunity for the development of leadership and service. *Tau Sigma* - Recognizing and promoting the academic excellence and involvement of transfer students.

# Academic Majors

The university confers bachelor's degrees for completion of academic disciplines established by the faculties of the colleges of Agriculture, Arts and Sciences, Business, Education, Engineering, and Health Sciences. Within each college, faculty expertise is concentrated in schools, departments, divisions, and programs to provide relevant advice, instruction, service, and research. College and department faculty administer the various major disciplines of study in subject areas selected by the students (including, when authorized, multi-college majors). Majors approved by the Trustees are listed below.

Minimum requirements for earning credits or a degree in any established major are fixed in advance and kept current by the faculty of the responsible units. Most established majors allow the students considerable latitude to attain individual goals. Selection of a major enables the student to study a body of knowledge in depth and concentrate on subjects of particular interest. A student may simultaneously earn credits in two majors, if approved by the respective departments.

If a student is not ready to declare a major concentration, an "undeclared" classification is available in each of the colleges. If the student is not ready to declare a college, a classification of "undeclared college and undeclared major" is available. The "undeclared" status is intended to be temporary for purposes of career exploration. Students are advised to declare and concentrate upon a major discipline as soon as possible.

A student who wishes to concurrently pursue a degree in more than one major must have advance approval of the involved college advisers and deans. Requirements for each of the majors must be fulfilled and credits in each must be applied to the same level of degree (i.e. bachelor's, master's, or doctoral). Students should consult with responsible faculty advisers in each major being attempted. Please refer to the section on concurrent majors and dual degrees in this catalog.

## Colleges:

AG: College of Agriculture and Natural Resources  
 AS: College of Arts and Sciences  
 CB: College of Business  
 ED: College of Education

EN: College of Engineering and Applied Science  
 HS: College of Health Sciences  
 LAW: College of Law  
 SER: School of Energy Resources  
 UW: Interdisciplinary

## Degrees:

B = Bachelor's  
 M = Master's  
 D = Doctorate  
 O = Other

Major Title	B	M	D	O
Accounting (CB)	*	*		
Agricultural business (AG)	*			
Agricultural communications (AG)	*			
Agricultural and applied economics (AG)		*		
Agricultural economics/water resources (AG)		*		
Agricultural education (ED)	*			
Agroecology (AG)	*			
Agronomy (AG)		*	*	
American Indian studies (AS)	*			
American studies (AS)	*	*		
Animal and veterinary science (AG)	*	*	*	
Anthropology (AS)	*	*	*	
Architectural engineering (EN)	*			
Art (AS)	*			
Art History (AS)	*			
Astronomy/astrophysics (AS)	*			
Atmospheric Science (EN)		*	*	
Biology (AS)	*			
Biomedical sciences (AG, EN, AS, HS)		*	*	
Botany (AS)	*	*	*	
Botany/water resources (AS)		*		
Business administration (CB)	*	*		
Business economics (CB)	*			
Chemical engineering (EN)	*	*	*	
Chemistry (AS)	*	*	*	
Chemistry (ACS approved) (AS)	*			
Civil engineering (EN)	*	*	*	
Civil engineering/water resources (EN)		*		

Major Title	B	M	D	O
Communication (AS)	*	*		
Computer engineering (EN)	*			
Computer science (EN)	*	*	*	
Counseling (ED)		*		
Counselor education and supervision (ED)			*	
Creative writing (AS)		*		
Criminal justice (AS)	*			
Curriculum and instruction (ED)			*	
Dental hygiene (HS)	*			
Earth System Science (affiliated major, interdisciplinary)	*			
Ecology (UW)			*	
Economics (CB)	*	*	*	
Economics and finance		*		
Economics/water resources (CB)		*		
Education (ED)		*	*	*
Electrical engineering (EN)	*	*	*	
Elementary education (ED)	*			
Elementary and special education	*			
Energy resource management and development (SER)	*			
Energy systems engineering (EN)	*			
English (AS)	*	*		
Entomology (AG)		*	*	
Environment and natural resources (affiliated major) (UW)				
Environmental engineering (EN)		*		
Environmental geology/geohydrology (AS)	*			
Family and consumer sciences (AG)	*	*		
Finance (CB)	*	*		
Food science and human nutrition (AG)		*		

<b>Colleges:</b>	EN: College of Engineering and Applied Science	<b>Degrees:</b>
AG: College of Agriculture and Natural Resources	HS: College of Health Sciences	B = Bachelor's
AS: College of Arts and Sciences	LAW: College of Law	M = Master's
CB: College of Business	SER: School of Energy Resources	D = Doctorate
ED: College of Education	UW: Interdisciplinary	O = Other

Major Title	B	M	D	O
French (AS)	*	*		
Gender and women's studies (AS)	*			
Geography (AS)	*	*		
Geography/water resources (AS)		*		
Geology (AS)	*	*	*	
Geology and earth sciences (AS)	*			
Geology/water resources (AS)		*		
Geophysics (AS)		*	*	
German (AS)	*	*		
History (AS)	*	*		
Humanities/fine arts (AS)	*			
Hydrologic science (UW)			*	
International studies (AS)	*	*		
Journalism (AS)	*			
Juris Doctor (LAW)				*
Juris Doctor/Master of Arts in Environment and Natural Resources (interdisciplinary)				*
Juris Doctor/Master of Public Administration (interdisciplinary)				*
Kinesiology and health (HS)		*		
Kinesiology and health promotion (HS)	*			
Management (CB)	*			
Management and marketing (CB)			*	
Marketing (CB)	*			
Mathematics (AS)	*	*	*	
Mathematics/science (AS)	*			
Mechanical engineering (EN)	*	*	*	
Medical laboratory science (HS)	*			
Microbiology (AG)	*			
Molecular and cellular life sciences (UW)			*	
Molecular biology (AG)	*	*	*	
Music (AS)	*			
Music education (AS)	*	*		
Music performance (AS)	*	*		*
Natural science (AS)		*		
Neuroscience (UW)		*	*	
Nursing (HS)	*	*		
Nursing practice (HS)			*	
Organizational leadership (Bachelor of Applied Sciences) (AG)	*			

Major Title	B	M	D	O
Petroleum engineering (EN)	*	*	*	
Pharmacy (professional) (HS)				*
Philosophy (AS)	*	*		
Physical education teaching (HS)	*			
Physics (AS)	*	*	*	
Physics plus (AS)	*			
Physiology (AS)	*			
Planning (community and regional) (AS)		*		
Political science (AS)	*	*		
Psychology (AS)	*	*	*	
Public administration (AS)		*		
Rangeland ecology and watershed management (AG)	*	*	*	
Rangeland ecology and watershed management/water resources (AG)		*		
Religious studies (AS)	*			
Russian (AS)	*			
Secondary education (ED)	*			
Self-designed major (AS)	*			
Social science (AS)	*			
Social work (HS)	*	*		
Sociology (AS)	*	*		
Soil science (AG)		*	*	
Soil science/water resources (AG)		*		
Spanish (AS)	*	*		
Special education (ED)	*			
Speech, language and hearing sciences (HS)	*			
Speech-language pathology (HS)		*		
Statistics (AS)	*	*	*	
Technical education (ED) - available only at the UW/CC Center	*			
Theatre and dance (AS)	*			
Theatre and dance (professional) (AS)	*			
Trades and industrial education (ED)	*			
Wildlife and fisheries biology and management (professional) (AS)	*			
Zoology and physiology (AS)		*	*	
Zoology and physiology/water resources (AS)		*		



# Admission to the University

**Admissions Office**  
150 Knight Hall  
Department 3435  
1000 E. University Avenue  
Laramie, WY 82071-2000  
www.uwyo.edu/admissions  
307-766-5160  
800-342-5996

## I. Undergraduate Admission

UW welcomes all students to apply and will consider each student based on their individual academic achievement. Students may apply for admission up to one year before they intend to enroll online at www.uwyo.edu/apply. Admission decisions are made on a rolling basis as soon as all application materials are received in the Admissions Office. To avoid delays and complications, all application materials should be on file in the Admissions Office at least 30 days before the beginning of the semester.

### Required Admission Application Materials

- Online application completed at www.uwyo.edu/apply
- \$40 non-refundable undergraduate application fee
- Official high school and/or college transcripts
- Official standardized test scores (ACT or SAT)

ACT or SAT results are required for new freshmen, applicants under 21 years in age, and used for admission, math placement, academic advising and academic scholarship consideration. High school students should take the ACT or SAT during the spring of their junior year or fall of their senior year. To be considered official, scores need to be submitted to UW directly from the testing agency or on the high school transcript. Writing sections in both the ACT and SAT are not considered as part of the admission requirements.

All official student transcripts must be sent directly to the Admissions Office by the originating institution. A final, official high school transcript indicating the graduation date is required post-graduation to complete admission requirements. UW Admissions only accepts faxed transcripts from Wyoming community colleges.

**Orientation:** All new freshmen and transfer students are strongly encouraged to attend new student orientation prior to their first UW semester. Sessions provide students with an opportunity to meet faculty and staff, plan an academic schedule, explore credit transfer, discuss college life, and register for courses. Additional information on orientation is available at www.uwyo.edu/orientation.

## A. New Freshmen

### 1. Assured Admission

To qualify for assured admission to the University of Wyoming, high school graduates who are first-time college students or college transfers with fewer than 30 transferable semester credit hours, must meet the following minimum admission requirements and complete the pre-college curriculum (see section 2).

**1a. High School Graduates:** Cumulative high school unweighted grade point average of 3.0 or above based on a 4.0 grading scale, and an ACT test score of at least 21 or a SAT test score (critical reading and math scores) of at least a 980.

**1b. Graduates with less than 30 transferable college credit hours:** Cumulative transferable college GPA must be at least 2.0; submit your high school transcript, ACT or SAT test score, and meet 1a.

**1c. Home Schooled must meet the same requirements as high school graduates;** submit transcripts and ACT or SAT test scores. Home schooled students must also submit a Home School Credit Evaluation Form completed by their instructor and available at www.uwyo.edu/admissions/freshman/admission-requirements.html.

### 2. Completion of at least 19 high school units in the following pre-college curriculum (a unit=1 year):

#### English

Four units of English or their competency-based equivalents are required, of which at least three units must have a substantial writing component. Speech and other communication-based courses which contain “a substantial writing component” may be used to meet this requirement.

#### Mathematics

Four units of mathematics or their competency-based equivalents are required, to include the concepts of a college preparatory Algebra I, Algebra II, Geometry sequence. It is strongly recommended that Algebra II, Geometry or a higher level math course be taken during the senior year of high school.

#### Science

Four units of science or their competency-based equivalents are required. At least one of the units must be from the physical sciences--physics, chemistry, or a college preparatory physical science course. The other two units may be from any combination of biological, life, physical or earth/space science.

#### Social Science

Three years of social studies or their competency-based equivalents are required, to include a combination of the following subject matter: World History, American History, Geography, American Government; or Economic Systems and Institutions.

#### Foreign Language

Two sequenced years of the same foreign language.

#### Electives

Two units of additional coursework chosen from any of the following subjects: fine and performing arts, social and behavioral studies, humanities, additional foreign language, or career-technical course.

### 2. Admission With Support

Admission with support will be granted to first-time college students or students with fewer than 30 transferable semester credit hours who do not qualify for assured admission, but who satisfy the following requirements.

- a. Submit official ACT or SAT test scores.
- b. Graduates of state accredited high schools who have a cumulative unweighted high school grade point average of:
  - o 2.5-2.99Or
  - o 2.25-2.49 with a minimum composite ACT test score of 20 or SAT score of 960 (math/critical reading combined)
- c. Completion of the precollege curriculum with no more than two deficiencies. In addition, no more than one deficiency can be in each of the precollege curriculum categories.

### ***Terms of Admission With Support***

Space in the Synergy program is limited; applicants admissible under this category are encouraged to apply early.

Students admitted with support will be a part of the Synergy Program and may access information at [www.uwyo.edu/synergy](http://www.uwyo.edu/synergy). It is strongly recommended that students stay within 12-15 credit hours in their first semester. Students who wish to go above 15 hours should contact the Synergy Coordinator at (307) 766-4322 or [synergy@uwyo.edu](mailto:synergy@uwyo.edu) to discuss an exception.

### **Holistic Alternative Admissions**

#### **Exception Process**

Students who do not meet the qualifications for assured admission or admission with support may be evaluated for admission under the Holistic Alternative Admission process. Please see [www.uwyo.edu/admissions](http://www.uwyo.edu/admissions) in the admission requirement section for more information.

## **B. Undergraduate Transfer Students**

College transfer students with 30 or more transferable semester credit hours must have a 2.0 or higher cumulative grade point average for admission to UW. College students interested in transferring to UW should go online to [www.uwyo.edu/transfer](http://www.uwyo.edu/transfer).

Applicants who have taken college-level course work and desire to transfer to the University of Wyoming should apply for admission and have one official transcript from each previously attended college or university sent directly to the Admissions Office. Course work from regionally accredited institutions will be evaluated by the Office of the Registrar.

Transfer students with less than 30 transferable semester hours must also have an official copy of their high school transcript sent directly to the Admissions Office by their former high school. Transfer students under age 21, who have less than 30 transferable credit hours, must also have their ACT or SAT results sent to the UW Admissions Office.

#### **Admission Exception Process**

College transfer students who do not meet the 2.0 grade point average requirement for admission to UW may initiate a request for admission by exception. Applicants should describe in writing the rationale for their specific exception request and send the request to the Admissions Office.

Students working toward a second bachelor's degree are considered undergraduate students and are subject to all undergraduate policies and regulations.

## **C. International Undergraduate Applicants**

The University of Wyoming will admit international students who meet admission requirements. Application deadlines are June 1 for fall semester, November 1 for spring semester and April 1 for summer session. The \$40.00 non-refundable undergraduate application fee must be received before the application will be processed.

1. Supply official, attested academic records and examination results. The records should be sent directly to the Admissions Office by the school attended. Applicants must also provide an English translation of all required academic records, and complete all applications and correspondence in English.
2. Provide proof of satisfactory English ability if student's native language is not English. This can be done by providing official score reports from TOEFL or IELTS. The minimum acceptable TOEFL score is 525 (71 iBT) for most majors or a 550 (80 iBT) for Engineering. The minimum acceptable IELTS score for most majors is 6.0 with a 6.5 required of prospective Engineering students. Contact Admissions ([Admissions@uwyo.edu](mailto:Admissions@uwyo.edu)) to inquire about other possible alternatives to the TOEFL and IELTS.
3. Provide evidence of adequate financial resources to pay the total cost of their education. The Confidential Financial Statement for undergraduate international applicants can be found online at [www.uwyo.edu/admissions/international/requirements-first-year.html](http://www.uwyo.edu/admissions/international/requirements-first-year.html).
4. Official ACT or SAT results are recommended, but not required for international applicants.
5. Proof of immunization for measles, mumps, rubella (MMR) and testing for tuberculosis are required prior to registration.

## **D. General Educational Development (GED) Certificate Holders**

Undergraduate applicants with GED credentials should contact the University's Office of Admissions for specific application requirements.

## **E. Adult Nontraditional Students**

Nontraditional admission requirements are:

1. Minimum age of 25;
2. Minimum of three years since last enrollment in college courses, except correspondence;
3. Send official copy of high school transcript or GED scores and any college transcripts directly to the UW Admissions Office by the previous institutions.
4. Students admitted under this policy are undeclared majors and will receive their initial academic advising from the Center for Advising and Career Services in 228 Knight Hall, (307) 766-2398.
5. Students considered for adult nontraditional admission must have had a 2.0 or higher grade point average in high school.
6. Neither ACT nor SAT scores are required for students over 21.

## F. High School Guest Students

High school seniors and juniors will be considered for admission to UW as high school guests. The following requirements must be met:

1. Complete a UW High School Guest application;
2. Have an official copy of the most recent high school transcript, showing an overall GPA of at least 3.0 sent directly to the Admissions Office;
3. Submit a positive written recommendation from the high school counselor or principal;
4. Submit available ACT or SAT scores.

If high school guest admission is granted, it is for one semester at a time. Subsequent enrollment requires the most recent transcript and new written permission from the high school. High school guests may take up to 6 credit hours per semester. Advising will be provided by the Center for Advising and Career Services in 228 Knight Hall, (307) 766-2398.

## G. Undergraduate Non-Degree Student

1. Must complete and submit a Non-Degree Student application and pay a non-refundable \$40.00 application fee.
2. Transcripts and test scores are not required for non-degree status.
3. Non-degree students may enroll in a maximum of 8 credit hours per semester (maximum of two courses). Only 12 credit hours taken in this status may be used towards a UW degree.
4. Admission with non-degree status is not available to international students or students on suspension.
5. Students admitted with non-degree status are assessed tuition and fees at the same tuition rate as degree-seeking students.
6. Students admitted with non-degree status do not qualify to receive financial aid.

## II. Graduate Admission

### A. Graduate Applicants

Prospective students are encouraged to consult with their respective academic department regarding the admission process before making a formal UW application.

Applicants must submit the UW graduate application and the non-refundable application fee. One set of official transcripts must be sent directly to the UW Admissions Office from each previous collegiate institution.

Domestic applicants must have completed at least a bachelor's degree from a regionally accredited institution. All applicants should have at least a 3.0 cumulative GPA (scale of 4.0).

Applicants whose department requires the Graduate Record Examination (GRE) must request official scores be sent to the Admissions Office directly from the Educational Testing Service (ETS). Our institution code with ETS is 4855. A score of at least 150 on the verbal reasoning section and a score of at least 141 on the quantitative reasoning section is required, (for doctoral programs a score of at least 153 on the verbal reasoning section and a score of at least 144 on the quantitative reasoning section is required).

Some departments may require scores from the Graduate Management Admission Test (GMAT), rather than the GRE, with a minimum score of 500.

Please note that some departments require higher GRE/GMAT scores than what is required by the Admissions Office.

Letters of recommendation may also be required by some departments.

Graduate applicants should contact the respective academic departments for questions concerning application status, degree program requirements, deadlines, and supplemental application materials they may require.

Students admitted with graduate standing may elect to take any undergraduate or graduate courses for which they are prepared, subject to restrictions as outlined in the *University Catalog*. However, tuition will be assessed at the graduate level for all courses taken with graduate status. Admission to graduate study does not automatically make a student a candidate for an advanced degree.

*Note:* Students working toward a second bachelor's degree are not considered graduate students and are subject to all undergraduate regulations.

### B. International Graduate Applicants

All graduate international students must also submit the following in addition to application materials required by the Academic Department.

1. Provide proof of satisfactory English ability if student's native language is not English. This can be done by providing official score reports from TOEFL or IELTS. The minimum acceptable TOEFL score is 540 (76 iBT). The minimum acceptable IELTS score is 6.5. Contact Admissions ([Admissions@uwyo.edu](mailto:Admissions@uwyo.edu)) to inquire about other possible alternatives to the TOEFL and IELTS.
2. As with the GRE/GMAT scores, many departments may require a higher level of English proficiency than what is required by the Admissions Office.
3. Provide evidence of adequate financial resources to pay the total cost of their education. The Confidential Financial Statement for undergraduate international applicants can be found online at [www.uwyo.edu/admissions/international/requirements-graduate.html](http://www.uwyo.edu/admissions/international/requirements-graduate.html). Students who are awarded a full graduate assistantship may not need to provide this documentation.

### C. Graduate Non-Degree Student

1. Must complete and submit a Non-Degree Student application including a non-refundable \$40.00 application fee.
2. Transcripts are required for proof of undergraduate degree for non-degree status, and must be submitted to the Admissions Office.
3. Non-degree students may enroll in a maximum of 8 credit hours per semester (maximum of two courses). Only 12 credit hours taken in this status may be used towards a UW degree. This 12-credit hour rule may be decreased if prior courses were reserved for graduate credit as either an undergraduate or as non-degree student.

4. Admission with non-degree status is not available to international students or students on suspension.
5. Students admitted with non-degree status are assessed tuition and fees at the same tuition rate as degree-seeking students.
6. Students admitted with non-degree status do not qualify to receive financial aid.
7. Non-degree graduate students who decide to pursue a degree must apply to and be accepted by their respective graduate program and the Admissions Office.

### III. College of Law Admission

(307) 766-6416

E-mail: [lawadmis@uwyo.edu](mailto:lawadmis@uwyo.edu)

Web site: [www.uwyo.edu/Law/](http://www.uwyo.edu/Law/)

Admission to the professional curriculum of law is granted by the College of Law Admissions Committee. The College of Law reserves the right to restrict the number of entering students to a class size consistent with its facilities and its educational objectives. Additional information and requirements are provided on the College of Law website.

1. Complete the electronic University of Wyoming College of Law Application for Admission through LSAC between October 1 and March 15. Applications received by December 1 will be considered for early admission.
2. Submit the application fee online through the College of Law website or by sending a check or money order to the College of Law.
3. Applicants must have a bachelor's degree from an accredited college or university (subject to some limited exceptions).
4. Take the Law School Admission Test (LSAT) administered by the Law School Admission Council (LSAC) no later than the February administration. The LSAT is given four times each year at numerous locations within and outside of the United States. Information about the test, dates, test locations and application form may be obtained from LSAC, Box 2000, Newtown, PA 18940-0998, (215) 968-1001, or on the Web at [www.lsac.org](http://www.lsac.org).
5. Register with LSAC's Credential Assembly Service (CAS) between September and January. Registration with CAS can be completed through the LSAC website ([www.lsac.org](http://www.lsac.org)). An official transcript from each college attended must be sent directly to CAS. It is advisable to register with CAS at the same time one registers for the LSAT. CAS prepares a report and forwards a copy to each law school to which application has been made. Applicants do not send transcripts directly to the College of Law until they are admitted. For more information about CAS, go to [www.lsac.org](http://www.lsac.org).
6. International students must supply current TOEFL scores. Minimum scores required for admission are 600 on the written exam or 100 on the internet-based exam. International students must take the LSAT exam and register with the Law School Admissions Council ([www.lsac.org](http://www.lsac.org)). If a transcript analysis will not be provided by the LSAC for any foreign educational institutions attended, official transcripts must be provided with an English translation.

### IV. WWAMI Medical Education Program

WWAMI is a contract program between the University of Wyoming and the University of Washington for medical education. Admission is twofold.

1. Applicants must be certified residents of Wyoming. To be eligible for certification, the applicant or parent or guardian must be a legal resident of the State of Wyoming for five continuous years immediately prior to enrolling at the University of Washington. Applications for certification are located at [www.uwyo.edu/hs/wiche-wwami-wydent-program/index.html](http://www.uwyo.edu/hs/wiche-wwami-wydent-program/index.html) and are due no later than October 15 of the year prior to the anticipated start date of medical school. Participants pay reduced tuition and must either pay back the money expended on their behalf plus interest or practice medicine in Wyoming for three years.
2. Applicants apply to the University of Washington School of Medicine through the usual procedures and are subject to criteria established by the University of Washington. Information may be obtained from the College of Health Sciences, Preprofessional Advising Office, Dept. 3432, 1000 E. University Ave., Laramie, WY 82071; (307) 766-6704 or (307) 766-3499 or [certoff@uwyo.edu](mailto:certoff@uwyo.edu).

### V. WYDENT Dental Education Program

WYDENT is a contract program between the University of Wyoming and the University of Nebraska College of Dentistry and Creighton University School of Dentistry for dental education. Admission is twofold.

1. Applicants must be certified residents of Wyoming. To be eligible for certification, the applicant or parent or guardian must be a legal resident of the State of Wyoming for five continuous years immediately prior to enrolling in dental school. The application for certification is located at <http://www.uwyo.edu/hs/wiche-wwami-wydent-program/index.html> and is due no later than October 15 of the year prior to the anticipated start date in dental school. Participants pay reduced tuition and must either pay back the money expended on their behalf or practice dentistry in Wyoming for three years.
2. Applicants must apply to the dental schools through the usual procedures and are subject to admission criteria established by the dental schools. Information is available from the College of Health Sciences; Preprofessional Advising Office; Dept. 3432, 1000 East University Av; Laramie WY 82071 (307) 766-6704 or (307) 766-3499 or [certoff@uwyo.edu](mailto:certoff@uwyo.edu).

### VI. School of Pharmacy Admission

Admission to the preprofessional pharmacy program is through the university admission process described previously.

Admission to the professional curriculum leading to the entry-level professional Doctor of Pharmacy (Pharm.D.) degree is granted by the Dean of the School of Pharmacy upon the advice of the School of Pharmacy Admissions Committee. The application process requires that students apply to the School of Pharmacy using PharmCAS, for more information about PharmCAS log on to [www.Pharmcas.org](http://www.Pharmcas.org). The application deadline is February 3rd for fall admission. Admission to the professional program is limited and competitive. For further information, contact the School of Pharmacy, Dept. 3375, 1000 E. University Ave., Laramie, WY 82071; (307) 766-6132.

## VII. Other Information

### Wyoming Senior Citizen Policy

Wyoming senior citizens, age 65 and over, who have been admitted to UW may enroll in university courses on a space available basis at no cost upon presentation of evidence of age and Wyoming residence prior to the beginning of the term in which classes will be taken.

Since standard registration fees will not be assessed, additional student benefits will not be available under the senior citizen policy. Alternatively, full-time senior citizen students wishing to receive student benefits may enroll and pay regular registration fees. Scheduled Outreach School classes which meet minimum enrollment requirements are included in the courses available to senior citizens.

### Board of Trustee Retirement Benefits

Beginning Spring 2002, official board retirees may attend University of Wyoming classes on a space available basis at no cost. To qualify for this benefit, you must be an official board retiree, 25 years of university service or age 60 with 15 years of immediately preceding university service.

### Readmission

Readmission is the process for former University of Wyoming students to again be admitted to the university. Former UW students who have attended another college since their last UW enrollment must have one official transcript from each college sent directly to the UW Admissions Office. Undergraduate students who are returning to UW after an absence of one semester or longer should complete an application for admission at least 30 days prior to registration, thereby allowing sufficient time to avoid delays in registration.

**Academic Reinstatement:** Former students who are on academic suspension at UW must petition for reinstatement through the dean of their college. Reinstatement petitions must be submitted at least 15 calendar days before the beginning of general registration for each term.

**Academic Renewal:** An undergraduate student who returns to UW and has not completed a college course at UW (excluding flexible enrollment [correspondence study]), during the previous five years, will have the option of continuing his or her earlier UW cumulative GPA or commencing a new cumulative GPA under the Academic Renewal policy. Interested students must submit the Academic Renewal Application Form (which can be obtained in the Office of the Registrar) to the registrar no later than ten class days before the last day of classes of the semester in which the student returns to UW.

The entire UW transcript will remain intact. A note indicating the policy will precede the new part of the UW transcript if the student opts for academic renewal. At the discretion of the academic department in which the student is enrolled, credit hours for which the student earned the grade of C or better may be applied toward the completion of the degree requirements. The list of any departmentally approved courses must be indicated on the Academic Renewal Application Form when initially submitted to the registrar. No further changes may be requested.

A student's GPA and completed courses that were applied to a baccalaureate degree are not eligible for academic renewal.

## Residency Student Classification

The following Trustee regulations govern the classification of students at the University of Wyoming as resident or non-resident for tuition purposes, and shall be administered by the Associate Vice President for Enrollment Management and Registrar. (Trustee Regulation, Chapter VIII, Section 3.)

### Student Classification for Tuition Assessment

The University of Wyoming assesses tuition for Wyoming residents at the in-state rate; non-residents are charged out-of-state tuition. The Associate Vice President shall administer the following guidelines for Enrollment Management and Registrar to govern University of Wyoming students for purposes of in-state or out-of-state tuition assessment for courses of study offered at the University. University-sponsored courses of study arranged with institutions outside Wyoming may have different residency requirements.

1. The following students are Wyoming residents:
  - a. Individuals who are financial dependents or under the age of 24 with a parent, guardian or spouse who lives in the State of Wyoming.
  - b. Individuals who are recipients of Wyoming high school credentials.
  - c. Active Wyoming National Guard members and U.S. Armed Forces members stationed in Wyoming, and their dependents.
  - d. Individuals with a permanent home in Wyoming and who have resided in the State for at least one full year. To determine if a permanent Wyoming home has been established, the following factors are considered: evidence that any former home has been abandoned; full-time employment performed or contracted for in Wyoming for one continuous year; ownership of home or property in Wyoming; one year of continual presence in Wyoming; former Wyoming residency and maintaining state ties; reliance on Wyoming resources for significant financial support; Wyoming vehicle registration; Wyoming address on most recent federal income tax form; A valid Wyoming driver's license; Wyoming voter registration.

Residing in Wyoming primarily as a student will not support a claim for resident status.

- e. Graduate students with University-funded fellowships.
  - f. Wyoming residents temporarily absent from the state due to military service, attendance at an educational institution, or other type of documented temporary sojourn.
  - g. Individuals who have been awarded resident tuition status at a Wyoming Community College and who attend the University within one year of leaving the Wyoming Community College.
2. The following students are non-residents:
    - a. Individuals who do not qualify for Section 1 above
    - b. Individuals who are not U.S. citizens or permanent residents except as provided by Section 1b. above.
  3. Reduced tuition rates calculated at one hundred fifty percent (150%) of resident tuition are available to the following non-residents:
    - a. Graduates of the University of Wyoming and their spouses;
    - b. Children of University of Wyoming graduates.

4. Change of residence classification shall be governed by the following process:
  - a. An initially assigned non-resident classification may be reviewed by the Associate Vice President for Enrollment Management and Registrar when a request and accompanying documentation is provided on or before the first day of classes. A decision on reclassification by the Associate Vice President may be appealed to the Residence Classification Committee within twenty (20) calendar days of the date of the Associate Vice President's decision. No reclassification will be retroactive to previous terms.
  - b. Individuals may be reclassified for the following term when facts indicate that a change in residency has occurred since the time of original residence classification.
  - c. The Associate Vice President for Enrollment Management and Registrar are responsible for the administration of this procedure.
5. There shall be a Residence Classification Committee consisting of three members appointed by the President, chaired by the Associate vice President for Enrollment Management and Registrar who shall not vote. The duties of this Committee shall be as follows:
  - i. To render interpretations and rulings at the request of the Associate Vice President for Enrollment management and Registrar;
  - ii. To serve as an appeals committee for students who wish to appeal the decision of the Associate Vice President for Enrollment Management and Registrar;
  - iii. To consider University policies in the area of residence classification and make recommendation to the Trustees of the University of Wyoming.

### **Measles, Mumps, Rubella (MMR) Immunization Requirement**

The University of Wyoming has implemented a policy to protect the University community against measles (rubeola), mumps, and rubella. All new on-campus students must provide proof of immunity to measles, mumps, and rubella prior to registration. The *Student Immunization Form* (available on the web at [http://www.uwyo.edu/shser/\\_files/docs/mmr%20-%20student%20immunization%20form.pdf](http://www.uwyo.edu/shser/_files/docs/mmr%20-%20student%20immunization%20form.pdf)) can be completed, verifying compliance with this requirement, and sent to the Student Health Service prior to registration. Two doses of MMR vaccine are required. Other acceptable methods to comply with the requirement are detailed on the Form. Please note that the Form must be verified and signed by a health care clinician. Alternatively, a verified copy of an immunization record can be appended to the Form.

The only contraindication to the MMR immunization is a previous severe allergic reaction to the vaccine or vaccine component (neomycin, gelatin). Relative (temporary) contraindications include: pregnancy; persons with immunosuppressive illnesses or treatment; moderate or severe acute illness; and recent receipt of blood products. If you are uncertain as to whether you should receive the immunization, please talk with your health care clinician.

Exemptions may be granted to the requirement in two instances: a medical exemption for a contraindication noted above, and a religious exemption. A medical exemption requires completion of the Medical Exemption Form with a notation of the reason for the exemption and a medical clinician signature. To claim a religious exemption, a notarized form must be completed and submitted. If an outbreak of one of these illnesses occurs on campus, students granted an exemption may be excluded from campus for the duration of the outbreak. Exemption forms can be found on the Student Health Service website ([www.uwyo.edu/shser](http://www.uwyo.edu/shser)).

For students unable to verify MMR vaccinations, the vaccine is available at the Student Health Service for a nominal charge. It will be administered prior to registration for any eligible student, without an appointment, during office hours. Do not wait until registration to comply with the MMR immunization requirement, as this will delay the process.

In addition to the MMR requirement, international students are required to undergo tuberculosis screening prior to registration. Based on screening, a tuberculosis (Mantoux) skin test or blood test may be performed, and, if positive, a chest x-ray obtained with consultation with a Student Health Service physician. The student is responsible for the costs incurred for these tests.

### **Campus Safety**

The University of Wyoming Police Department (UWPD) provides comprehensive law enforcement and security services to all components of the University including the academic campus, and other properties owned or controlled by the University. The University Police Officers are commissioned under Wyoming State Statute and have the full range of police authorities granted any peace officer including power to arrest, on property owned by or under the control of the University of Wyoming, including adjacent public streets and sidewalks. University Security Officers work closely with our police officers in constantly patrolling University properties and assisting employees and visitors in accessing University facilities. The UWPD operates 24 hours a day, 365 days a year, and is located at 1426 East Flint, Laramie, Wyoming 82071.

Campus safety is the responsibility of all members of the university community. Faculty/staff, students, and guests are encouraged to report crimes and other concerning behavior or observations promptly. The Dean of Students Office, Student Conduct, The STOP Violence Program, and the Office of Diversity and Employment Practices are available to provide further information.

A full description of campus safety, crime statistics, and educational programs designed to increase safety on campus is available in the 2014 Annual Security and Fire Safety Report of the University of Wyoming. To access the report, go to [www.uwyo.edu/uwprd/\\_files/2014uwsecurityreport.pdf](http://www.uwyo.edu/uwprd/_files/2014uwsecurityreport.pdf).

# Student Financial Aid

The Office of Student Financial Aid coordinates all student financial assistance available at UW. Available aid includes scholarships, grants (Hathaway Scholarships, Federal Pell, Federal SEOG), loans (Federal Perkins, Federal Direct, Federal PLUS and private) and employment (Federal Work-Study).

The Student Financial Aid office will help all qualified applicants to secure aid, but resources are limited. Aid is offered first to those applicants whose materials are completed and received by March 1 prior to the academic year for which aid is sought. Federal Pell Grants and Federal Direct Loans are available to qualified applicants throughout the year.

Unless another deadline is specified, prospective students seeking scholarships should send an application for admission, the nonrefundable application fee and a copy of their current high school or college transcript to the UW Admissions Office by March 1. Students who have attended another college must have that college submit an academic transcript to the UW Admissions Office.

Students seeking federal aid or assistance based on their financial need must file a Free Application for Federal Student Aid (FAFSA). Applicants may do so at [www.fafsa.ed.gov](http://www.fafsa.ed.gov). Allow one week for processing. UW recommends using IRS Data Retrieval (available two weeks after filing taxes) when completing the FAFSA. Final responsibility for ensuring that all required documents are received in a timely manner rests with the applicant.

## Enrollment Requirements

Students must attend classes to be eligible for federal financial aid or be prepared to pay all the money back. Most scholarships require the recipient to be enrolled full time. Hathaway Scholarships, Federal Pell Grants, and veteran's benefits may be pro-rated for part-time enrollment and Federal Direct Loans may only be borrowed by students enrolled for at least half time (a minimum of 6 hours for undergraduate, law and pharmacy students; a minimum of 4.5 hours for graduate students). Federal Pell Grants and Federal SEOG Grants are available to undergraduate students who have not completed the requirements for their first undergraduate degree. Classes for audit are not acceptable for any kind of financial aid. Generally, Federal aid is not available for UW Flexible Enrollment (correspondence) courses, for continuous registration hours, or for audit hours. For details, ask a financial aid adviser.

## Eligibility Requirements

To receive federal financial aid (such as Federal Pell, and Federal SEOG grants, Federal Work Study, Federal Perkins, Federal Direct [subsidized or unsubsidized], and Federal Direct PLUS loans) you must meet the following conditions and provide supporting documentation when requested to do so: have a high school diploma or its equivalent, be enrolled or accepted for admission as a regular student at UW, not be concurrently enrolled in an elementary or a secondary school, be enrolled in a degree program, be a U.S. citizen or eligible non-citizen, have a demonstrated financial need if required, not exceeded lifetime

Pell grant eligibility, if a Pell grant student, be prepared to prove attendance, maintain satisfactory academic progress (SAP), not be in default on a federal student loan or owe an overpayment of a federal grant at any institution (or, if so, have made satisfactory arrangements to repay or otherwise resolve the overpayment or default), not have borrowed in excess of the annual or aggregate loan limits of a federal loan program (loan borrowers only), agree to use funds received only for educational costs, register with the Selective Service if required, and not have had federal financial aid benefits suspended as result of a drug conviction.

## Satisfactory Academic Progress (SAP)

The University Of Wyoming Office Of Student Financial Aid is responsible for ensuring that all students receiving federal financial aid meet minimum standards. The University of Wyoming standard of Satisfactory Academic Progress (SAP) measures all students' academic performance.

Satisfactory Academic Progress is reviewed at the end of each payment period (fall, spring, summer) and the following three areas are measured:

1. Qualitative -- UW cumulative grade point average (Cum GPA) earned
2. Quantitative (Pace)-- completion rate for coursework enrolled
3. Timeframe- maximum time frame to complete a degree

## Minimum Standard Requirements

### *Qualitative Standard*

A student must successfully meet the following minimum UW cumulative GPA for their program:

- Undergraduate programs - 2.0
- Professional programs - 2.0
- Graduate programs - 3.0

### *Quantitative Standard (Pace)*

A student must successfully complete 67% of the cumulative hours attempted.

$$\text{Pace} = \frac{\text{Cumulative \# of credit hours successfully completed}}{\text{Cumulative \# of credit hours attempted}}$$

The following courses do count as attempted and completed in the SAP calculation.

- Successfully completed courses with grades of A, B, C, D, or S
- Transfer hours accepted toward completion of the student's program
- Academic Renewal hours earned through previous enrollment
- Advanced Placement Credit
- Incomplete grades that are now completed
- Experiential Learning Credits
- Summer Session credits successfully completed
- Credits earned through Study Abroad and Consortium agreements

The following courses do count as attempted and not completed in the SAP calculation:

- Failed
- Withdrawn
- Incomplete
- Repeat
- Unsatisfactory

The following courses do not count as attempted or completed in the SAP calculation:

- Correspondence
- Audit
- Credit by exam
- Remedial
- Enrichment

### *Timeframe Standard*

A student must be making progress toward a degree. The University of Wyoming sets the following maximum timeframe for student degrees:

- Undergraduate- 180 hours (150% of 120 hours)
- Master's Program- 45 hours (150% of 30 hours)
- Doctorate Program- 108 hours (150% of 72 hours)
- Law- 135 hours (150% of 90 hours)
- Pharmacy- 213 hours (150% of 146 hours)

Transfer hours accepted toward completion of the student's program are used in the calculation of the Timeframe Standard.

When pursuing multiple degrees or changing majors the maximum time frame may be adjusted based on a student generated appeal that includes a degree audit.

### **Sap Statuses**

#### *Financial Aid Warning*

Students who have not met the minimum standard requirements for the previous semester will be placed on a Warning status. Students on Warning status are eligible for financial aid for one additional payment period. Students who do not meet Minimum Standard Requirements at the end of their Warning semester will be placed on Suspension for the next term. *Note:* Students who receive all failing grades in a semester are immediately placed on financial aid suspension.

#### *Financial Aid Suspension*

Students who have not met the minimum standard requirements (after being placed on Warning) are placed on Suspension. Students who are on Suspension are not eligible for financial aid unless a SAP appeal with academic plan is approved by the SAP Committee. Submitting an appeal does not guarantee approval. Students awaiting a decision on their SAP appeal are responsible for paying their tuition and fees by the payment deadline.

### *Financial Aid Probation*

Students who have successfully appealed a financial aid suspension are placed on probation and are eligible to receive federal aid for one more payment period. After Probation, the student must be making SAP or successfully following their academic plan. Students are reviewed each term for compliance with their Academic Plan and SAP Standards.

### **Reinstatement**

If a student loses federal financial aid eligibility due to not meeting SAP standards, they can regain eligibility in one of the following ways:

1. Completing courses using their own resources that will satisfy the deficient SAP area.
2. Successfully appealing by submitting a SAP Appeal Form with supporting documentation.

### **SAP Appeal Process**

Students who have been suspended can appeal their status by submitting the SAP Appeal Form (one semester or multi semesters) and a formal written request with supporting documentation to the financial aid office no later than the conclusion of the "Drop/Add" period for the current semester. The appropriate appeal form is available to the student once they have met with a SAP counselor. The SAP Appeal Form must include the following:

- an explanation with supporting documentation of any extenuating circumstances that prevented the student from maintaining satisfactory academic progress,
- an explanation of what has changed that will allow the student to succeed academically,
- an academic plan signed by academic advisor that will enable student success, and
- a degree audit for those students who have reached their maximum timeframe.

All appeals are reviewed by a Financial Aid SAP committee. The review time for appeals may take a minimum of 2 weeks. Students will be notified of the results by email and/or mail. If the appeal is denied, students may request an additional review by the Director of Financial Aid. Students must submit new information with supporting documentation for a secondary review. The Director's decision is final.

### **Funds Distribution**

Each student who registers has his or her own student account with the university. Once a qualified student has registered for classes and accepted their awards on WyoRecords, the Office of Student Financial Aid will authorize the electronic transfer of funds from UW financial aid accounts to the student's individual account at the university.

First-time borrowers of federal student loans must participate in entrance loan counseling (view a web presentation). All student loan borrowers must participate in an exit loan interview (in person or on the web) prior to leaving UW.

Federal Work-Study funds are paid as payroll checks or direct deposit on the 15th and last working day of the month. Payroll checks may be direct deposited or mailed to the student.

The university will automatically charge a student's account for tuition and fees based on the student's enrollment. Likewise, if the student is living in a university residence hall, room and board charges will be placed on the student's account.



Any financial aid credited to a student's account will automatically pay tuition and fees first and then charges for room and board in UW residence halls. Unless directed otherwise in writing by the student, any remainder will be applied to other university charges. If a negative balance results, a credit balance will be prepared by the university and will be refunded to the student through the University's electronic refunding process.

Scholarships awarded for the academic year will be split into two equal payments to the recipient's student account with one to be paid at the beginning of each semester. Most non-UW scholarships are paid in the fall semester unless the donor or selection committee specifically directs that it be paid differently.

Students enrolled in a domestic or international exchange program or a study abroad program approved by UW for academic credit are eligible to apply for federal student financial assistance. Likewise, students concurrently enrolled in classes at two or more eligible institutions of post-secondary education may apply for federal aid. A special consortium agreement between institutions must be completed prior to each semester a concurrently enrolled student seeks aid. Those granted a Federal Work-Study allocation have opportunities to perform community services to earn their allocation.

Information describing available aid, award criteria, rights and responsibilities of aid recipients, costs of attendance or refund and repayment policies and schedules is available by writing to Office of Student Financial Aid, Dept. 3335, 1000 E. University Ave., Laramie, WY 82071, or viewing the financial aid web site at [www.uwyo.edu/SFA/](http://www.uwyo.edu/SFA/).

*Important:* Students are assumed to be full-time when their initial financial aid is determined. If you plan to attend less than full-time in any semester, your financial aid will be adjusted to reflect your true tuition costs. It is always best to make the Office of Student Financial Aid aware of your intended enrollment prior to the start of a semester so that accurate amounts of financial aid may be applied to your account.

Financial aid policies are subject to change without notice to reflect modifications in federal, state and institutional laws and regulations.

## Veterans Educational Benefits

Students who have served in the armed forces may be allowed credit for courses taken in some military schools. Students who desire to apply for credit on the basis of the military schools should submit a copy of the DD-214 Form or its equivalent to the Office of the Registrar. Individual colleges will determine whether such courses will be applicable to degree programs.

All veterans seeking educational benefits must register with the veterans' certification specialist in the Office of Student Financial Aid, 174 Knight Hall, (307) 766-2525. This includes completing a veteran's registration card each semester.

Those veterans not completing a veteran's registration card by the last day of the late registration period will be dropped from VA educational assistance at the university. Class load requirements for veterans are as follows:

### Undergraduate and Pharm.D. Veterans:

Full-time	12 or more credit hours
3/4 time	at least 9, but fewer than 12 hours
1/2 time	at least 6, but fewer than 9 hours
Less than 1/2	registration credit hour fee reimbursement only

### Graduate and Law Veterans:

Full-time	9 or more graduate credit hours or certification by the Office of the Registrar*
3/4 time	at least 7 but fewer than 9 graduate credit hours or certification by the Office of the Registrar*
1/2 time	at least 4.5, but fewer than 7 graduate credit hours
Less than 1/2	registration credit hour fee reimbursement only

\*The final responsibility for seeing that the veterans' certification specialist has a certification from the Office of the Registrar rests with the student. It must be received by the last day of scheduled registration.

If any portion of a veteran's schedule is composed of courses which are less than the full semester in length (i.e., short courses, workshops, "blocked" courses, etc.), the rate of benefit payment may be affected. If you have any questions or concerns, contact the veteran's certification specialist in the Office of Student Financial Aid, 174 Knight Hall, (307) 766-2525.

Withdrawal from a class or classes could reduce a veteran's benefits for that term. For details, contact the veteran's certification specialist in the Office of Student Financial Aid.

## National Guard Benefit

Active Wyoming National Guard members in good standing and considered to be satisfactory participants may apply to participate in the Guard's Education Assistance Plan. The Plan provides 100 percent tuition and mandatory fee payment for all courses (except repeated courses) leading to one degree at UW, as long as the recipient continues to meet academic and service commitment requirements. Recipients must agree to serve in the Guard for at least two years after earning their degrees. This benefit may be used concurrently with Veterans Educational (GI Bill) Benefits. For information and application packets, please contact the Wyoming National Guard at 800-832-1959, ext. 5262, the UW Outreach School at 800-448-7801, or the UW financial aid office at (307) 766-3016.

# Tuition and Fees

## Semester Tuition and Fee Schedule 2015-16 (subject to change)

The University of Wyoming semester tuition and fee schedules for the 2015-16 academic year, which begins with fall semester 2015, will be available on WyoRecords or from Accounts Receivable, Room 250, Knight Hall, on April 1, 2015.

Summer school tuition and fees will be published in the *Summer Bulletin*.

Full-time undergraduate refers to undergraduate students enrolled for 12 or more hours, and part-time undergraduate refers to undergraduate students enrolled for less than 12 hours. At the graduate level, 9 or more hours is considered full time and less than 9 hours is classified as part time. Fees do not include special fees.

## Student Benefit Package and Insurance

At the beginning of each semester, the part-time student benefit package will be added to student accounts of all part-time students (6 through 11.5 credit hours for undergraduates and 4.5 through 8.5 credit hours for graduate students) who have elected to purchase UW health insurance. The benefit package allows part-time students the same benefits as full-time students including, but not limited to, the use of Student Health Service, Half Acre Gym and the opportunity to apply for short-term emergency student loans.

Graduate students taking less than 4.5 credit hours should contact their academic department and also refer to the "Graduate Student Optional Fee Package Petition" document, which may be found on the Office of the Registrar website. Graduate students not receiving a fee waiver need to pay for the package at the Cashier's Office, 170 Knight Hall.

Each enrolling student will be required, as part of the registration process, to make a Student Medical Insurance selection. **If the eligible student selects "YES" to the question, the premium will be assessed on the student's account. If the student selects "NO," they will not be assessed for the premium. Part-time students who select yes for the health insurance will also be assessed for the Part-time Student Benefit Package. Student medical insurance is mandatory for international students.**

For questions regarding the Student Medical Insurance program, contact the Student Medical Insurance Advocate (248 Knight Hall) at (307) 766-3025 between 8 a.m. and noon weekdays.

## Tuition and Fee Payment 2015-16

All university charges are due prior to 4 p.m. the third Friday of each Fall and Spring Term.

An institutional Payment Plan is available for students who:

1. have made the 1st installment payment of 1/3 total current term charges due plus 100% of prior term charges, required prior to 4 p.m. the third Friday of the term or
2. have "OFFERED and ACCEPTED" financial aid equal to or greater than the 1/3 total current term charges plus 100% of prior term charges.

A \$15.00 payment plan enrollment fee is charged per semester. The payment plan allows for two additional payments approximately six weeks and nine weeks into the term. Please see the semester class schedule for the exact due dates. Interest of 1.5% per month may be charged on all past due amounts.

Charges for a course delivered by Outreach Credit Programs are due approximately one month before the first day of the class or upon enrollment, whichever occurs later. **Please contact Outreach Credit Programs (1-800-448-7801) for details and for exact deadline dates.**

## Special Course Registration Fees

Additional charges (special course and college fees) must be paid by students enrolling in those courses and colleges with approved special fees. Fees for these courses and colleges will be indicated in the semester Class Schedule.

## Tuition Waivers

If an employee, spouse of an employee or cooperating agency waiver is used for payment of tuition and/or fees, the properly completed and signed waiver must be received by the Accounts Receivable office by the first day of the term. Late waivers will not be accepted. All waivers will be applied to accounts after the drop deadline.

## Financial Holds

A student failing to pay fees, charges, fines, penalties, deposits or short term loans as prescribed by the Trustees of the University of Wyoming shall be denied registration at the university and copies of academic transcripts and/or diplomas until such fees, charges, fines, penalties, deposits or short term loans are paid in full. A ten-day wait is required before a student loan hold can be removed if the debt is paid with a personal check. Contact Accounts Receivable or the Student Financial Operations Office in Knight Hall for information regarding financial holds.

## Summer Session 2015

Please refer to the *2015 Summer Bulletin* for rates and applicable deadlines.

## Refunds/Cancellations

Tuition and course fees will be canceled or refunded to a student who officially drops a class or classes, withdraws from the university through the Dean of Students office, or changes enrollment status (i.e. non-resident to resident; full-time to part-time) in accordance with the institutional refund policy outlined below.

No tuition penalty will be assessed for dropping and adding during the drop period identified in the term's class schedule unless all classes are dropped or an all-school withdrawal is processed. Students who withdraw from individual courses after the end of the drop/add period will have their charges canceled in accordance with the institutional refund policy outlined below.

Mandatory fees, late registration fees, or service fees are not refundable.

The portion of tuition refund/cancellation is computed from the first day of the term, not class meeting pattern. If a student's initial registration includes blocked classes or short courses that begin at a later

date, the refund/cancellation will still be computed from the first day of the term. If a student's initial registration occurs during an approved late registration period, the date for computing a refund/cancellation will be the first day of the term.

#### **Institutional Refund Schedule**

Before first day of semester	100%
Semester Class Day 1-8	100%
Semester Class Day 9-15	80%
Semester Class Day 16-20	70%
Semester Class Day 21-25	60%
Semester Class Day 26-30	50%
Semester Class Day 31-35	40%
Semester Class Day 36 on	0%

Examples of these calculations are available in Accounts Receivable.

The refund schedule for Outreach School courses may vary; see the Outreach School course schedule for current dates.

### **Financial Aid Federal Return of Funds Policy**

A student who receives federal financial aid (other than Federal Work Study pay checks) and chooses to complete less than 60% of an academic term is considered not to have earned all the federal aid he or she has been awarded.

- If aid already disbursed is equal to earned aid, no further action is required.
- If aid already disbursed is less than earned aid, additional aid may be offered to the student after he or she withdraws.
- If aid already disbursed is greater than earned aid, UW and/or the student must return some federal funds.

To determine whether federal funds have been earned or must be returned, UW follows this procedure:

1. Determine the percentage of the term the student completed. This is calculated by dividing the number of calendar days (including weekends) in a term into the number of calendar days that the student was in attendance for that term.
2. Apply the percentage of time attended to the total amount of federal aid the student was eligible to receive for the term. This is the student's "earned aid."
3. Subtract the amount of earned aid from the amount of aid actually disbursed to the student. A positive remainder is the student's "unearned aid." A negative remainder is the student's "earned aid" that may still be offered to the student.
4. Determine the amount of unearned aid remaining that must be repaid by the student. Subtract the amount of unearned aid repaid by the institution from the total amount of unearned aid.

All unearned aid will be returned to the federal student loan lender or federal aid accounts in the following order: (1) Unsubsidized Stafford Loan; (2) Subsidized Student Loan; (3) Federal Perkins Loan; (4) Federal PLUS (Parent) Loan; (5) Federal Pell Grant; (6) ACG-Smart; (7) Federal SEOG Grant. Any amount owed by the student on a grant will be reduced by 50%.

The date of a student's withdrawal from UW will be the date of the student's notification to the Office of Student Life of an intent to withdraw. When a student fails to officially withdraw from UW, it will be assumed that the withdrawal date is the midpoint of the semester or the last date of documented academic activity.

UW will repay the lesser of (1) the total amount of unearned aid or (2) an amount equal to the student's institutional charges multiplied by the percentage of unearned aid. "Institutional charges" is defined as charges for tuition and fees, plus room and board charges for students living in UW residence halls and apartments. It does not include such charges as bookstore charges, student health insurance premiums, parking citations, or library fines.

The amount of unearned aid owed by the student on a loan may be repaid under the normal repayment terms of the loan. The amount of unearned aid owed by the student on a grant must be repaid immediately.

Any amount of earned aid not yet disbursed to the student will be offered to the student. Such offers will cover any undisbursed grants first, followed by the undisbursed loans.

Examples of how the amount of unearned federal aid a student must return is calculated are available from a professional adviser in the office of Student Financial Aid. A chart detailing the percentage of earned and unearned aid, by calendar day of the semester, is provided in the term's class schedule. In brief, to determine the percentage of earned federal aid, the calculation will use the total number of calendar days in the term divided by the total number of calendar days the student attended.

### **Interaction of Federal Return of Funds Policy and Institutional Refund Policy**

When a student who receives federal financial aid withdraws from the university, he or she may owe a repayment of federal funds and/or be due a refund from UW or owe an additional amount to UW. The Federal Return of Funds policy will be applied before any refund due under the UW policy is disbursed. For details on the application of these policies to a specific situation, please consult with the Accounts Receivable Office, 250 Knight Hall, (307) 766-6232.

### **Student WyoOne ID Cards 28 Knight Hall, (307) 766-5268**

ID cards are issued to all students during their first semester of enrollment. These cards are used throughout the student's entire career at the university.

The ID card, also referred to as the WyoOne card, is needed to pick up transcripts, financial aid, cash checks, access student health services, attend athletic events, enter recreation facilities, check out library books and materials, food service access, enter residence halls, and other necessities. Visit the online card office at [uwadmnweb.uwyo.edu/idoffice/](http://uwadmnweb.uwyo.edu/idoffice/) to make deposits, view transaction history, and access other card management features.

The WyoOne card may also be used as a debit card to make purchases on campus after the deposit account is established. Spouses, domestic partners and dependents of students are eligible for an ID card.

# Credit Available to Undergraduate Students

*The University of Wyoming offers credit towards an undergraduate degree through:*

## I. University of Wyoming Credit

### Instructed Classes

Courses are offered on campus and at Outreach School settings around the state, including recognized academic courses under faculty general supervision such as internships, clerkships, clinical experience, co-op programs, etc.

Distance courses. Unlike some institutions, UW delivers courses at a distance through its mainstream academic departments, not through a separate academic unit. Academic department heads have the authority to assign instructors to distance-delivered courses, including online courses. They also have a responsibility to ensure that those courses are comparable in rigor and effectiveness to courses delivered face to face.

For this reason, when a department offers a UW course both face to face and at a distance, any UW student may satisfy any relevant university-, college-, and department-level requirements or elective credit by taking the course in either format. This policy applies to Laramie-based students as well as students taking courses delivered through the Outreach School.

Exceptions may arise when it is necessary to reserve space in a distance-delivered course for off-campus students, who can't take the face-to-face version. In these cases, departments may reserve spaces for off-campus students. But to the extent that spaces remain available after all interested off-campus students have enrolled, these spaces must be available to interested on-campus students.

### Correspondence Study

A maximum of 24 semester hours may be earned by correspondence study courses regardless of where the credit is earned. Correspondence study courses taken by postbaccalaureate students will appear on the transcript but will not be included in cumulative hours earned, as correspondence study credit is not applicable toward a postbaccalaureate degree.

### Credit by Examination

While there is no maximum placed on the amount of credit earned by examination, credit so earned does not count in fulfilling the residency requirement of 30 hours of upper division University of Wyoming credit.

Students showing proficiency by passing examinations such as the College Board Advanced Placement Program (AP), for example, or examinations developed by University of Wyoming departments may earn college credit through the level of demonstrated proficiency. Credit may be allowed on the basis of any testing procedure acceptable to any department, which may include tests of the AP program and both the general and subject (specific) examinations of the College Level Examination Program (CLEP).

A student may not earn credit by examination in a course if the student has completed a course in the subject matter area above the level of the course for which the examination is sought. However, at the discretion of the departments involved, during the drop/add period a student may challenge a lower-level course while enrolled in a higher-level course in the same subject matter area, if the course challenged is a prerequisite for the course in which the student is currently enrolled.

An examination of an appropriate type and content for the credit sought may be conducted to determine if the applicant's proficiency is equivalent to that which could be expected upon completion of a college-level course in the subject. An applicant found to have this level of proficiency will be awarded credit for that course and allowed to proceed either with more advanced courses or with courses in other areas.

Information concerning credit by examination can be obtained by contacting the Office of the Registrar.

### Options include:

- Specific departmental course examinations
- Subject CLEP tests
- AP tests
- International Baccalaureate (IB)

Eligible students who pay the testing fee of \$80.00 may not be denied an examination in the introductory undergraduate course in any department, if such an examination exists. "Introductory course" is interpreted as that course which is prerequisite for successive courses in the department. Additional fees for examinations offered by testing agencies other than the University of Wyoming are determined by the agency concerned.

Grades of S or U (satisfactory/unsatisfactory) are given in all examinations. Credit by examination is not included in the student's grade point average; it is, however, included in the hours earned toward graduation. The grade of S is the equivalent of C or better. See below for specific subject requirements. Entry on the student's academic record for credit by examination is made only if a grade of S is obtained and is noted as a grade obtained by examination.

To qualify for undergraduate credit, the student must be currently registered at the University of Wyoming as a degree candidate. The student must also be able to demonstrate to the satisfaction of the chair of the department involved that background experience has prepared him or her to attempt a challenge examination if such an examination is sought. The department chair's decision will be based upon existing departmental constraints such as accreditation, graduation requirements, and program requirements.

The use of credit by examination, or credit for prior learning, in graduate programs is to be determined by the student's consulting committee in conjunction with the dean of the affected college.

A student may not be allowed credit by examination in a course in which the student is currently or was previously enrolled either for credit or as a visitor or auditor, except that credit by examination may be used as a means to obtain credit for courses previously taken at institutions from which credit is nontransferable. A student may not challenge equivalent courses.

**Advanced Placement (AP) Information**

Subject	Acceptable Score	UW Course Number(s)/Title(s), Semester Credit Hours
Art History	4+	ART 2020 (3), Art History II
Biology	4, or 5	LIFE 1010 (4), General Biology
Calculus AB	3, 4, or 5	MATH 2200 (4), Calculus I
Calculus BC	3, 4, or 5	MATH 2200, 2205 (8), Calculus I and II
Chemistry	4 or 5	CHEM 1020, 1030 (8), General Chemistry I and II
Computer Science A	4	COSC 1010 (4), Intro to Computer Science I
Computer Science A	5	COSC 1010, 1030 (9), Intro to Computer Science I, Computer Science I
Computer Science AB	4 or 5	COSC 1010, 1030 (8), Intro to Computer Science I and II
Environmental Science	3, 4, or 5	ENR 1200 (4), Environment
European History	3, 4, or 5	HIST 1120 (3), Western Civ. II
French Language	3	FREN 1010 (4), 1st yr. French I
French Language	4	FREN 1010, 1020 (8), 1st yr. French I and II
French Language	5	FREN 1010, 1020, 2010 (12), 1st yr. French I, II, 2nd yr. French I
French Literature	3	FREN 2140 (3), Intro to Reading
German Language	3	GERM 1010 (4), 1st yr German I
German Language	4	GERM 1010, 1020 (8), 1st yr. German I and II
German Language	5	GERM 1010, 1020, 2030 (12), 1st yr German I, II, 2nd yr. German I
Government and Politics	3, 4, or 5	POLS 0000 (3) (fulfills the US Constitution requirement; eligible to take the one-hour Wyoming Constitution exam)
Government Comp.	3, 4, or 5	UNST GOV (3), Comparative Government Credit
Human Geography	4 or 5	GEOG 1020 (3), Intro to Human Geography
Language & Composition	4 or 5	ENGL 1010 (3), English Composition*
Latin Literature	3	LATN 1010 (4), 1st yr. Latin I
Latin Literature	4	LATN 1010, 1020 (8), 1st yr. Latin I, II
Latin Literature	5	Latin 1010, 1020, 2030 (12), 1st yr. Latin I, II, 2nd yr. Latin I
Literature & Composition	4 or 5	ENGL 1010 (3), English Composition
Microeconomics	4 or 5	ECON 1020 (3), Principles of Microeconomics
Macroeconomics	4 or 5	ECON 1010 (3), Principles of Macroeconomics
Music Theory	4 or 5	MUSC 1030 (3), Music Theory I and MUSC 1035 (1), Aural Theory I
Physics B	4 or 5	PHYS 1310 (4), College Physics I
Physics C	4 or 5	PHYS 1310, 1320 (8), College Physics I and II
Psychology	3, 4, or 5	PSYC 1000 (3), General Psychology
Spanish Language	2	No credit, but student should contact the department for possible placement in SPAN 1020

Subject	Acceptable Score	UW Course Number(s)/Title(s), Semester Credit Hours
Spanish Language	3	SPAN 1010, 1020 (8), 1st yr. Spanish I, II
Spanish Language	4	SPAN 1010, 1020, 2030 (12), 1st yr. Spanish I and II and 2nd yr. Spanish I
Spanish Language	5	SPAN 1010, 1020, 2030, 2040 (16), 1st yr. Spanish I, II; 2nd yr. Spanish I, II
Spanish Literature and Culture	2	No credit but student contact department for placement
Spanish Literature and Culture	3	SPAN 2030 (4), 2nd yr. Spanish I
Spanish Literature and Culture	4+	SPAN 2030, 2140 (7); 2nd yr. Spanish I, Introduction to Literature
Statistics	3+	STAT 2050 (4), Fund of Statistics
Studio Art 2D	4+	ART Elective (3)
Studio Art 3D	4+	ART Elective (3)
Studio Art Drawing	4+	ART Elective (3)
U.S. History	4 or 5	HIST 1210, 1220 (6), US History I and II
World History	4	HIST 1330 (3), World Civ. from 1450
World History	5	HIST 1330, 1320 (6), World Civilizations to 1450 and from 1450

\*Credit is available for either Language and Composition or Literature and Composition, not both.

**College Level Examination Prep (CLEP)**

Subject	Acceptable Score	UW Course Number(s)/Title(s), Semester Credit Hours
American Government	50 or above	POLS 0000 (3), (fulfills US Constitution requirement, eligible to take the one-hour Wyoming Constitution exam)
Analyzing and Interpreting Literature	50 or above	USP CH (3)
Biology	50 or above	LIFE 1010 (4), General Biology
Introductory Business Law	50 or above	MGT 1040 (3)
Calculus	50 or above	MATH 2200 (4), Calculus I
Chemistry	50 or above	CHEM 1020 (4), Gen. Chemistry I
College Algebra	50 or above	MATH 1400 (3), College Algebra
Financial Accounting	50 or above	ACCT 1010 (3), without USP
French Language	41 to 49	FREN 1010 (4), 1st yr. French I
French Language	50 to 56	FREN 1010, 1020 (8), 1st yr. French I and II
French Language	57 or above	FREN 1010, 1020, 2030 (12), 1st yr. French I, II, 2nd yr. French I
German Language	40 to 47	GERM 1010 (4), 1st yr. German I
German Language	48 to 53	GERM 1010, 1020 (8), 1st yr. German I and II
German Language	54 or above	GERM 1010, 1020, 2030 (12), 1st yr. German I, II, 2nd yr. German I
History of the U.S. I	50 or above	HIST 1210 (3), United States History I
Humanities	50 or above	ENGL 2130 (3) Creative Impulse
Information Systems and Computer Applications	50 or above	COSC 1200 (3) Computer Information Systems
Intro to Educational Psychology	47 or above	3 hours of general transfer credit
Pre-Calculus	50 or above	MATH 1450 (5), Algebra & Trigonometry

Subject	Acceptable Score	UW Course Number(s)/Title(s), Semester Credit Hours
Principles of Management	50 or above	MGT 3210 (3), Management & Organization
Principles of Marketing	50 or above	MKT 3210 (3), Intro to Marketing
Principles of Macroeconomics	50 or above	ECON 1010 (3), Principles of Macroeconomics
Principles of Microeconomics	50 or above	ECON 1020 (3), Principles of Microeconomics
Introductory Psychology	50 or above	PSYC 1000 (3), General Psychology
Social Sciences and History	50 or above	USP CS (3)
Spanish Language	41 to 49	SPAN 1010 (4), 1st yr. Spanish I
Spanish Language	50 to 53	SPAN 1010, 1020 (8), 1st yr. Spanish I and II
Spanish Language	54 or above	SPAN 1010, 1020, 2030 (12), 1st yr. Spanish I, II, 2nd yr. Spanish I
Statistics	48 or above	STAT 2070 (4), Intro to Statistics for Social Sciences
Introductory Sociology	56 or above	SOC 1000 (3), Sociological Principles
Western Civ. I	50 or above	HIST 1110 (3), Western Civilization I
Western Civ. II	50 or above	HIST 1120 (3), Western Civilization II

### DANTES Standardized Subject Tests (DSST)

Subject	Acceptable Score	UW Course Number(s)/Title(s), Semester Credit Hours
General Anthropology	50 or above	USP CS, G (3)
Art of the Western World	50 or above	USP CA (3)
Civil War and Reconstruction	47 or above	3 hours upper-division elective credit
Criminal Justice	46 or above	3 hours general elective credit
Environment and Humanity	46 or above	3 hours of general elective credit
Ethics in America	50 or above	USP CH (3)
Here's to your Health	400 or above	PEAC 1001 (3) lecture component; must complete activity for USP P credit
History of the Vietnam War	53 or above	HIST 1220 (3) US History II
Human/Cultural Geography	48 or above	3 hours general elective credit
Human Resource Management	46 or above	3 hours general elective credit
Introduction to Business	400 or above	3 hours general elective credit
Introduction to Computing	400 or above	3 hours general elective credit
Introduction to World Religions	50 or above	RELI 1000 (3), Introduction to Religion
Lifespan Development Psychology	50 or above	3 hours general transfer credit
Management Information Systems	400 or above	3 hours general elective credit

Organizational Behavior	46 or above	3 hours general elective credit
Money and Banking	48 or above	3 hours general elective credit
Personal Finance	46/400	3 hours general elective credit
Physical Geology	46 or above	3 hours general elective credit
Principles of Finance	400 or above	3 hours upper-division elective credit
Principles of Financial Accounting	50 or above	ACCT 1010 (3) no USP credit
Principles of Physical Science	47 or above	3 hours general elective credit
Principles of Public Speaking	47 or above	3 hours general elective credit
Principles of Supervision	400 or above	3 hours general elective credit
Rise and Fall of the Soviet Union	49 or above	3 hours upper-division elective credit
Substance Abuse	49/400	3 hours upper-division elective credit

### International Baccalaureate (IB)

Subject	Acceptable Score	UW Course Number(s)/Title(s), Semester Credit Hours
Adv. Math SL	4+	MATH 2200, 2205 (8), Calculus I and II
Social/Cultural Anthropology HL	4+	ANTH 2200 (3), World Culture
Social/Cultural Anthropology SL	4+	ANTH 1200 (3), Intro to Cultural Anthropology
Art/Design HL	4	ART 1000 (3), General Art Studio ART 1010 (3), General Art History
Biology HL	4+	LIFE 1010 (4), General Biology
Biology SL	4+	LIFE 1010 (4), General Biology
Chemistry HL	4	CHEM 1020 (4), Gen. Chemistry I
Chemistry HL	5+	CHEM 1020 (4), Gen. Chemistry I CHEM 1030 (4), Gen. Chemistry II
Chemistry SL	5+	ELEC 1000 (4), Physical Science Elective, USP SP
Computer Science HL	4+	COSC 1010, 1030 (8), Intro to Computer Science I and II
Computer Science SL	4+	COSC 1010 (4), Intro to Computer Science I
Economics HL	4+	ECON 1000 (3), Global Econ. Issues
Economics HL	5+	ECON 1010(3), Principles of Macroeconomics; ECON 1020 (3), Principles of Microeconomics
Economics SL	4+	ECON 1000 (4), Global Econ. Issues
English HL	4+	ELEC 1000 (3), USP Credit for WA or C1
Environmental Systems and Societies	4+	ENR 1200 (4), Environment
French Language	4	FREN 1010 (4), 1st yr. French
French Language	5	FREN 1010, 1020 (8) 1st yr. French I and II
French Language	6/7	FREN 1010, 1020, 2030 (12), 1st yr. French I, II, 2nd yr. French I
German Language	4	Germ 1010 (4) 1st yr. German I
German Language	5	Germ 1010, 1020 (8), 1st yr. German I and II

Subject	Acceptable Score	UW Course Number(s)/Title(s), Semester Credit Hours
German Language	6/7	GERM 1010, 1020, 2030 (12), 1st yr. German I, II, 2nd yr. German I
History - American HL	4	HIST 1210, 1220 (6), US History I and II
History-European	4+	UNST CS (3), Cultural Context Social Science
History - Africa HL	4+	ELEC 1000 (3), Transfer Credit Elective
History - Asia and Oceania HL	4+	ELEC 1000 (3), Transfer Credit Elective
History - Europe and the Middle East HL	4+	ELEC 1000 (3), Transfer Credit Elective
Information Technology/Global Awareness	4+	UNST G (3), Global Awareness
Macroeconomics, Principles of	6/7	ECON 1010 (3), Principles of Macroeconomics
Math SL	4+	MATH 1450 (3), Algebra & Trigonometry
Math HL	4	MATH 2200, 2205 (8), Calculus I and II
Math Studies	4+	UNST QA (3), Quantitative Reasoning I
Music HL	4	Music 1000 (3), Intro to Music
Music Theory SL	4+	Music 1000 (3), Intro to Music
Philosophy HL	4+	3 hours of general transfer credit
Physics HL	4	PHYS 1110, 1120 (8), General Physics I and II
Psychology SL	4+	PSYC 1000 (3), General Psychology
Russian Language	4	RUSS 1010 (4), 1st yr. Russian I
Russian Language	5	RUSS 1010, 1020 (8), 1st yr. Russian I and II
Russian Language	6/7	RUSS 1010, 1020, 2030 (12), 1st yr. Russian I, II, 2nd yr. Russian I
Spanish Language	4	SPAN 1010 (4), 1st yr. Spanish I
Spanish Language	5	SPAN 1010, 1020 (8), 1st yr. Spanish I and II
Spanish Language	6/7	SPAN 1010, 1020, 2030 (12), 1st yr. Spanish I, II, 2nd yr. Spanish I
Theory of Knowledge	B or A	3 hours of USP CH credit
Performance/Theatre Prod. HL	4+	THEA 2050 (3), Theatre Practice
Visual Art SL	4	ART EL (6), Art Elective, USP CA
Visual Art HL	4	ART EL (12), Art Elective, USP CA

## Portfolio Evaluations

In recognition of factors in our society that produce great individual differences in backgrounds and preparation of students entering the university, the university has developed various options to assess extra-institutional college-level learning. To qualify for undergraduate credit, the student must be currently registered at the University of Wyoming as a degree candidate.

Credit based on faculty evaluation of the kinds and extent of college-level learning which an applicant has acquired in prior extra-institutional settings, evidenced in a portfolio of documentation, may count toward university undergraduate graduation requirements. In such event, the

student's degree program can be enriched by freeing time needed to take additional courses, or accelerated to earn the baccalaureate degree earlier and commence postgraduate studies sooner.

The number of credit hours able to be earned by means of a portfolio evaluation is normally limited to 12. Such credit, when awarded, shall be for specific University of Wyoming content-oriented courses (rather than given as X number of hours of credit in a general discipline area), following the college course model of assessment as defined by the Council for Adult and Experiential Learning. Portfolio assessment, when used, will be conducted by a committee of appropriate tenured faculty including at least one member with the academic rank of professor. *All credit assigned for experiential learning based upon portfolio evaluations is excluded from the minimum credit hour requirements as set forth in the university requirements.*

## II. Transfer Credit

Transfer credit includes college courses accepted from other regionally accredited colleges or universities. Such course work must be considered equivalent or comparable to course work required by the University of Wyoming. The university accepts only academic courses in the study of religion similar to those offered by the Religious Studies Program in the College of Arts and Sciences.

Students transferring to UW must have the registrar or records office of the previous school(s) send an official transcript to the University of Wyoming Admissions Office. Once all final transcripts have been received by the Admissions Office, the degree analysts in the Office of the Registrar will create an electronic record of all courses that transfer to UW.

Evaluations are not accomplished for students working toward a Second Bachelor's Degree. Second Bachelor's students should consult with their adviser concerning the applicability of transfer work to their UW degree program.

The recording of credit does not automatically imply acceptance toward a degree since degree requirements vary from major to major. Acceptance of credit toward a major is dependent upon final approval by the student's academic adviser. Questions concerning the transferability of course work from other institutions should be directed to the Office of the Registrar.

### a. UW Policy (Academic Affairs Policy Letter, 9 October 2012)

UW maintains a system for accepting transfer credits from other institutions and prides itself on forward-looking approaches to distance education. The following clarifies policies for:

- Accepting transfer credit from Wyoming's public community colleges
- Accepting transfer credit for students transferring to UW from other institutions
- Accepting transfer credit for students enrolled at UW

### 1. Transfer credit from Wyoming's public community colleges

For any student, UW will accept credit earned at any Wyoming public community college in accordance with the Wyoming Higher Education Course Transfer Guide/Statewide Course Catalogue. This policy applies to students transferring to UW and to students enrolled at UW who take courses at one of these community colleges while they pursue degrees at UW.

UW maintains an active regimen of institution-wide and discipline-specific articulation with Wyoming community colleges. These discussions, together with department-driven decisions about which courses to list in the statewide common course-numbering system, provide mechanisms that can ensure appropriate levels of course equivalency.

## 2. Transfer credit for students transferring from other institutions

The UW registrar's office maintains a list of course equivalencies and courses accepted for general credit from other institutions of higher learning. In maintaining this list, the registrar, in consultation with academic departments as necessary, determines which outside courses:

- are equivalent to specific UW courses when students transfer to UW
- count for general university-level credit when students transfer to UW
- are not transferable for university-level credit when students transfer to UW.

For course beyond the 1000-2000 level and in cases where questions arise, the registrar relies on academic departments to make the assessment.

For any student transferring to UW from another institution of higher learning, UW will adhere to the registrar's equivalency and general transfer list on the date that the transcript is evaluated. If a course in question doesn't appear in the list, the registrar will follow the normal protocol, in consultation with academic departments, to make a determination. If an academic department determines that an outside course improperly appears on the list, the registrar will correct the list according to the department's guidance. The corrected list will apply to subsequent transfer students but not retroactively.

## 3. Transfer credit for students enrolled at UW

The university's faculty and administration expect UW students to earn credits by taking courses at UW. Exceptions may be appropriate in some instances. For example, the university encourages students to pursue opportunities to study abroad, whether through UW course offerings or through other approved programs. As another example, a student who spends a summer in another university town may also have a compelling case for taking a non-UW course and applying the credits to the UW transcript. There are many other possibilities.

For any student enrolled at UW, the university will guarantee transfer credits only for courses for which the student has received prior, course-specific approval from an academic advisor and the affected academic department head. A Transfer Guarantee Form should be submitted prior to enrolling for a transfer course.

The only exceptions are transferable credits from Wyoming community colleges, as discussed above. In considering requests of this type, academic department heads may take into account the student's circumstances, department- and university-level learning outcomes such as global awareness, and the department faculty's assessment of the course's content, level, and academic rigor.

This policy has no effect on such programs as WICHE's Internet Course Exchange and other inter-institutional arrangements through which courses taught elsewhere count as credit-bearing UW courses.

## b. Process

Transfer credit includes college courses accepted from other accredited colleges or universities. Such course work must be considered equivalent to course work required by the University of Wyoming. Students transferring to UW must have the registrar or records office of previous school(s) send an official transcript to the University of Wyoming Admissions Office. Once all final transcripts have been received by the Admissions Office, the degree analysts in the Office of the Registrar will create an electronic record of all courses that transfer to UW.

The recording of credit does not automatically imply acceptance toward a degree since degree requirements vary from major to major. Acceptance of credit toward a major is dependent upon final approval by the student's academic adviser. Questions concerning the transferability of course work from other institutions should be directed to the Office of the Registrar.

## c. Articulation Agreements

### 1. Wyoming Community College Articulation Agreement

Students entering UW beginning fall 2001 and who have completed an AA, AS, or AB degree from a Wyoming Community College (spring 2001 or later) receive credit toward completion of the lower division general education requirements included in the University Studies Program. Two types of graduates are addressed in this agreement:

- a. All Wyoming community college graduates (AA, AS, or AB degree) who have completed the prescribed thirty (30) credit hour Wyoming community college Common General Education Core and, in addition, a second three (3) credit hour college-level math course, will be deemed to have met UW's lower-division general education requirements.
- b. All Wyoming community college graduates (AA, AS, or AB degree) who have completed the prescribed thirty (30) credit hour Wyoming community college Common General Education Core, but who lack the second three (3) credit hour college-level math course will be required to complete the second mathematics course either at the community college or at the University before they will be deemed to have met UW's lower-division general education requirements.

This articulation agreement applies to *graduates* receiving an Associate of Arts, an Associate of Sciences, or an Associates of Business degree from any of the seven Wyoming Community Colleges spring 2001 or later. All graduates with an AA, AS, or AB degree complete a minimum of 64 college-level credits with a minimum of 2.0 GPA.

Nontraditional credits awarded by another institution will not normally be accepted by the University of Wyoming. They may be validated by departmental exam within the faculty regulations allowing for such examinations. Credits awarded at other institutions based on ACT or SAT scores or College Level Examination Program (CLEP) general examinations will not be accepted as transfer credit, unless the examination score appears on the transcript.



## 2. Colorado Community College Articulation Agreement

Graduates of regionally accredited Colorado community colleges earning an AA/AS Spring 2012 or later are awarded the lower-division general education core in the same manner as graduates of Wyoming community colleges, with the exception of the UW/WY Government and Constitutions requirement. Students must complete the Wyoming component through coursework or challenge exam.

Spring 2008 (and later) graduates of Pikes Peak Community College are included due to a pre-existing articulation agreement.

## 3. Other Community College Articulation Agreements

Spring 2012 and later AA/AS graduates of Western Nebraska, Mid-Plains (Nebraska), and Colby (Kansas) Community Colleges will be extended the lower-division general education core in the same manner as Colorado schools above.

## Transfer Credit from Regionally-Accredited U.S. Colleges and Universities

The page [https://wyosssb.uwyo.edu/bnrprod/bwcktyfc.p\\_display\\_transfer\\_catalog](https://wyosssb.uwyo.edu/bnrprod/bwcktyfc.p_display_transfer_catalog) allows students to look up courses that the University of Wyoming has previously accepted from regionally accredited U.S. institutions. When a direct match to a Wyoming course cannot be determined, general elective and/or University Studies credit is awarded. Transfer courses which return values of "NA" in the UW Subject field are not transferable to UW. If a particular course is not found, that may simply mean that no one has previously attempted to transfer it in. All new classes will be evaluated on an individual basis. All new upper-division courses will initially be given upper-division general elective credit. The university faculty will then determine whether or not an upper-division course has a direct UW equivalency.

Credit is awarded credit hour for credit hour. Quarter hours are recognized as two-thirds (2/3) of a semester hour.

Should a course be transferred as an elective, it may be substituted for a major requirement with adviser approval. Elective courses may also be considered for University Studies requirements via the University Studies petition process.

The fact that a course appears in the list is no guarantee that the course will transfer in each individual case. Students intending to transfer to UW are encouraged to meet with their advisors and review both the Transfer Catalog and the UW Catalog when planning their program of study to ensure courses taken elsewhere will transfer to UW in their desired major. Final determination of transfer credit acceptance is made by the University Registrar and faculty. Students must submit official transcripts of all completed coursework before a final determination can be made on credit transfer.

These equivalencies are subject to change without notice.

## Wyoming Transfer Catalogue

The Wyoming Transfer Catalog is available at [https://wyosssb.uwyo.edu/bnrprod/bwcktyfc.p\\_display\\_transfer\\_catalog](https://wyosssb.uwyo.edu/bnrprod/bwcktyfc.p_display_transfer_catalog). The page allows searches of how courses from other collegiate institutions will transfer to the University of Wyoming (UW) or which UW courses may be offered at other institutions. Transfer courses which return values of "NA" in the UW Subject field are not transferable to UW. If a course is offered at another collegiate institution but is not found in the Wyoming Transfer Catalog, please feel free to contact the UW Office of the Registrar at [registrar@uwyo.edu](mailto:registrar@uwyo.edu) or (307) 766-5272 to inquire of the process to have new courses evaluated for transferability. Community college students intending to transfer to UW are encouraged to meet with their advisors and review both the Wyoming Transfer Catalog and the UW Catalog when planning their program of study to ensure courses taken at the community colleges will transfer to UW in their desired major. UW advisors may apply transferable courses to individual major requirements in accordance with college/departmental policies.

## III. Military Service Courses

Students who have served in the Armed Forces may be allowed transfer credit for courses taken in some military schools. Students who desire to apply for credit on the basis of their military schooling should submit a copy of their DD-214 form or AARTS/SMART/CCAF transcript (or equivalent) to the UW Admissions Office. The degree analysts in the Office of the Registrar determine whether the course work is transferable to UW. Evaluations for the granting of credit for military-based training are based on recommendations in the American Council of Education (ACE) guidelines. Individual colleges will determine whether such course work is applicable to their degree programs.

# The Grading System

*Students are evaluated according to the following grading system:*

Grade	Pts.	Definition
A	4.000	
A-	3.667	
B+	3.333	
B	3.000	
B-	2.667	
C+	2.333	
C	2.000	
C-	1.667	
D+	1.333	
D	1.000	
F	0.000	Failure (may be assigned as a grade for failure to attend or to indicate failure to formally withdraw)
I		Incomplete (temporary mark pending coursework completion as agreed in a signed document). See section on incompletes below for details.
W		Withdrawal (from the individual course or all courses), only if the student follows the official withdrawal procedure. If a student enrolls in a course and then abandons it (stops attending) without following the official withdrawal procedure, a grade of F will be assigned.
S		Satisfactory (equivalent to a C or better [B or better in courses numbered 5000 or above]; see general information on S/U grading below)
U		Unsatisfactory (see general information on S/U grading below)
UK		Unable to compute grades (for midterm grades only)

## Grade Points

Each letter-graded course carries grade point value computed as: the total credit hours earned in the course multiplied by the point value of the letter grade earned. For example: a student earning an A (point value of 4) in a 3 credit-hour course would earn 12 grade points for the course.

## Semester (or Term) Grade Point Average

The semester grade point average (GPA) is the sum of all grade points earned in a semester or term divided by all credit hours attempted for letter grade. Credit hours in courses in which marks of I, W, S, or U were assigned, as well as developmental courses, are excluded.

## Cumulative Grade Point Average

The average of all grades earned by a student below is termed the cumulative grade point average. It is used for determining activity eligibility, honors, probation, suspension, graduation, and for all comparisons or purposes requiring measurement of academic standing.

The cumulative grade point average is defined as the sum of all grade points earned in University of Wyoming residence, correspondence, or the Outreach School, divided by all credit hours attempted for letter grade, with the following exceptions:

1. The credit hours shall not be counted in courses in which marks of W, S, or U were assigned, or in which marks of I (for incomplete) are still in effect.
2. For repeated courses:
  - a. First repeat: only the second credit and grade is used to calculate the cumulative grade point average.
  - b. If repeated more than once, only the last credit and grade earned is used to calculate the cumulative grade point average.
  - c. A student is limited to a maximum of three (3) attempts, including withdrawals, in any course at the University of Wyoming.
  - d. If a mark of W, S, or U is assigned in a repeated course, the previous grade assigned will stand except when an S or U is earned repeating a previous S or U.
  - e. Courses applied towards one completed degree may be repeated as part of a second degree; however, the grade and grade point average in the original degree will not be changed.
3. Transfer grades are not counted in the UW grade point average. If a course taken at UW is repeated for the first time at another institution, the credits and grade earned at UW will be deleted from computation of the UW cumulative grade point average if credit for the repeated course is transferred to UW.
4. For graduate students, courses numbered below 4000 are not added in to the semester and cumulative totals, nor computed into the GPA.

## Incompletes (I)

A grade of "I" (incomplete) is a temporary grade assigned to students who, due to unforeseen circumstances, were unable to complete all work required for a course. It may be awarded only if the class instructor has approved a petition to be filed prior to grade submission by the instructor to the Registrar at the end of the term in which the student was enrolled in the class. (UW Regulation 6-720)

Time allowed for completing course requirements will normally not exceed 120 calendar days beyond the end of the semester in which the I was given. The dean of a college may designate certain research courses where the 120-day limit may be extended by the instructor; however, the completion date even in these courses should not be later than the time of graduation for the student unless the student is reserving the particular course for graduate credit.

If the final grade for the course is not received in the Office of the Registrar by the date indicated on the authorization, the I will revert to an F. Should graduation occur in the interim, the I can stand permanently or it can still be completed within the specified deadline, but the student's GPA at graduation with all associated honors will stand as computed.

## General Information on S/U Grading

The grade of S (satisfactory) is interpreted to include grades A-C and the grade of U (unsatisfactory) to include grades D-F on the conventional grade scale for courses numbered less than 5000 (for courses 5000 or above, the grade of S is interpreted to include grades A and B). Credit hours of S/U courses are counted as hours attempted toward graduation. However, neither the S nor U grade carries grade points and neither will be included in the calculation of the cumulative grade point average.

Students may not take a course for S/U credit to satisfy University Studies Program requirements, unless the course is offered for S/U only; (e.g., POLS 1000, or the equivalent history or economics courses, may not be taken for S/U).

If a mark of S or U is assigned in a repeated course, the previous grade assigned will stand except when an S or U is earned repeating a previous S or U.

Students must signify at the time of registration or schedule modification whether they are taking any course for S/U grades. Faculty will be notified of the student's decision.

The faculties of the various colleges and interdisciplinary programs shall determine the number of credit hours of S that may be used to satisfy degree requirements in their programs. They may also place restrictions upon the use of S credits to satisfy college or major requirements. In addition, they may designate particular courses in their colleges as courses to be offered for S/U only.

A student who changes majors within a college or who transfers to a different college may petition for the acceptance of S credits previously earned if such credits are in conflict with faculty-established regulations for the new major or college.

## Mid-Term Grades

Mid-term grades for all courses numbered below 5000 are to be submitted by instructors on WyoRecords the week following midsemester. Grades which can be assigned by faculty are:

### Grade Definition

D	Poor
F	Failure (may also be assigned as a grade for failure to attend or to indicate failure to formally withdraw)
S	Satisfactory (equivalent to a C or better) in cases where the class is offered for S/U or the student has elected the S/U option
U	Unsatisfactory (equivalent to a D or F) in cases where the class is offered for S/U or the student had elected the S/U option
UK	Unknown; unable to compute grade

The UK grade may be assigned if, due to lack of performance assessments such as exams, papers, homework, etc., a faculty member is unable to make a determination of a midterm grade.

*Please note that the midsemester grade received in any particular class reflects the assessment of student performance during the first portion of the semester only.*

Mid-term grades are available on WyoRecords.

## End of Semester Grade Reports

Final grades are available on WyoRecords as soon as possible (usually within five working days) after the close of the semester or term.

### Definitions

1. Cumulative semester hours attempted shall be the total of all credit hours attempted through the University of Wyoming, except for credit hours attempted in repeating a course, those in which marks of W were assigned, and those accepted in transfer from other institutions.
2. The cumulative grade point average is defined as the sum of all grade points earned through the University of Wyoming divided by the sum of all credit hours attempted through the university, except for credit hours in which marks of W, S, U, or I are assigned or those of an initial course which has been repeated. When a course has been repeated, only the last grade points and credit hours assigned for repeats of the course shall be entered in the computation of the cumulative grade point average.

## Grade Appeal

A recorded grade may be changed through established appeal processes within individual colleges. Contact your department for further information about appealing a grade.

## Academic Transcripts

Official transcripts of individual academic records at UW are sent from the Office of the Registrar upon written authorization signed by the individual. Individuals may also authorize the release of their academic transcripts through WyoRecords. All financial obligations to the university must be cleared before a transcript may be released or viewed on WyoRecords.

Transcripts are produced on a first-come, first-served basis and one to two business days must be allowed. Individuals are asked to anticipate transcript needs and submit requests to the Office of the Registrar as far in advance as possible. Usually, 10-15 days are needed at the close of a semester to record semester grades and issue transcripts. Same-day transcript service is available for a \$10 fee (limit of 2 transcripts).

Partial transcripts are not issued. Each transcript includes the complete academic record at the University of Wyoming and the number of credits from other institutions accepted by UW.

Official transcripts of credit earned at other institutions which have been presented for admission or evaluation of credit become the property of the University of Wyoming and are not reissued or copied for distribution. This includes high school records and any other type of supporting documents. Transcripts of work completed at other institutions should be obtained directly from the issuing institution.

Applicability of transfer credit toward any degree is dependent on the curriculum pursued by the student.

In preparing transcripts for graduate students or second bachelor's degree candidates whose undergraduate work was taken elsewhere, the University of Wyoming includes on its transcripts no detailed reference

to that undergraduate work, mention being limited to designation of the degree and date received and the name of the institution granting the degree.

## Honor Roll

Undergraduate and law students who achieve high scholastic grades are honored by being placed on the President's Honor Roll, the academic Dean's Honor Roll, or the Provost's Honor Roll.

### The requirements to be met to attain these honors are:

#### *For President's or Dean's Honor Roll:*

1. Undergraduate students must complete a minimum of 12 UW semester hours on a basis of A, B, C, D, or F. Exception: if a student is student teaching, the student must be enrolled in a minimum of 12 UW semester hours, at least 7 of which must be graded on the basis of A, B, C, D, or F with no semester grade of I. Courses taken for audit do not count for honor roll purposes.
2. A GPA of 4.0 for the President's Honor Roll.
3. A GPA of 3.25 or better for the academic Dean's Freshman Honor Roll.
4. A GPA of 3.4 or better for the academic Dean's Honor Roll for undergraduates above freshman standing.
5. In the College of Law, students are eligible for the academic Dean's Honor Roll when enrolled in a minimum of 13 UW semester hours of law courses. In the College of Law, a grade point average of 3.25 or better is required for first year students and a GPA of 3.4 or better is required for second and third-year students for the academic Dean's Honor Roll.
6. Students having consortium agreements with other institutions are not considered to be full-time for honor roll purposes.

#### *For the Provost's List:*

1. Undergraduate students must complete a minimum of 6 UW semester hours, but fewer than 12 UW semester hours, of which at least 6 UW semester hours must be graded on the basis of A, B, C, D, or F with no semester grade of I. Courses taken for audit do not count for honor roll purposes.
2. A GPA of 3.5 or better.

## Graduate Students

Graduate Students are not eligible for the President's Honor Roll, the academic Dean's Honor Roll, or the Provost's List.

## Academic Probation and Suspension

### Undergraduate Students

#### *Academic Status*

In order to graduate, every student is expected to maintain satisfactory academic progress, which is based on scholastic performance. Current academic status will be indicated on internal documents and grade reports as:

- good standing
- academic probation
- academic suspension: normally not eligible to petition for reinstatement until one full semester, exclusive of summer term, has elapsed. The dean of the college in which a suspended person wishes to continue may waive the four-month delay if the dean is assured that the person has made suitable progress toward resolving the academic deficiencies.

#### **Undergraduate Academic Probation**

1. Academic probation shall constitute notice that a student is not progressing satisfactorily toward the bachelor's degree or Pharm.D.
2. A student enrolled at the University shall be placed on academic probation at the end of the semester or summer term when his/her cumulative GPA at UW falls below a 2.00.
3. A student placed on academic probation will be so notified by email. This information is also available on WyoRecords.
4. A student shall be removed from academic probation at the end of the semester or summer term in which his/her cumulative GPA is 2.00 or above.
5. Students who fail to remove themselves from probation or earn a semester grade point average below 2.0 in the next semester or summer term attempted will be suspended from the university for not maintaining the criteria for satisfactory academic progress. Students on probation who register for a semester or summer term and then withdraw from that semester or term will be suspended, as it is considered an attempted semester or term.

#### **Undergraduate Academic Suspension**

1. Academic suspension is the dismissal of a student from the University due to the student not making satisfactory academic progress toward the bachelor's degree.
2. A student who is suspended for unsatisfactory academic performance should not be permitted to petition for reinstatement until one full semester, exclusive of summer term, has elapsed. Students may petition once per semester for reinstatement, and, if denied by any college or the Center for Advising and Career Services, cannot petition for reinstatement until the next fall or spring semester, unless there are documented extenuating circumstances justifying immediate reinstatement.
3. A suspended student may not enroll for any University of Wyoming credit classes (including on-campus, online, correspondence, and Outreach).
4. Credit earned at another accredited college or university while a student is suspended from the University may be accepted under the usual regulations governing the transfer of credit after the student has been reinstated.
5. A student placed on academic suspension will be so notified by letter.

## Undergraduate Academic Reinstatement

1. A college may have an academic reinstatement policy that is more restrictive than the general university policy.
2. Academic reinstatement is the readmission of a suspended student to the University. The student is eligible to be considered for readmission. The reinstated student will be on academic probation during his/her first semester or summer term of reinstatement after which he/she may be removed from this probation.
3. A petition for reinstatement must be submitted no later than 15 days before the beginning of the semester or summer term in which the student wishes to register. A petition received after this deadline may not be processed until after the regular registration period.
4. The decision on a petition for reinstatement will be made by the dean (or designee) of the college in which the student wishes to enroll. Undeclared students should contact the Director of the Center for Advising and Career Services. A student who has been reinstated must remain in the college in which he/she has been reinstated for that semester.
5. Students placed on academic suspension are eligible for a maximum of three reinstatements. Any student placed on academic suspension for the fourth time is not eligible for reinstatement for a minimum of five years from the end of the last term of attendance.
6. Students who are suspended as a result of spring semester grades will have the suspension invoked at the beginning of the summer term, excluding any course(s) which had begun prior to the determination of the academic suspension.

### Exceptions

Upon the request of a person placed on academic suspension or denied reinstatement, the vice president for academic affairs may review the circumstances and reverse the decision of the dean if the vice president for academic affairs deems it necessary to prevent a gross injustice.

## Academic Renewal

An undergraduate student who returns to the University and who has not completed or withdrawn from a college course at UW (excluding correspondence study courses) during the previous five years will have the option of continuing his or her earlier UW cumulative GPA or commencing a new cumulative GPA under the Academic Renewal policy. The student must submit the Academic Renewal Application Form (which may be obtained from the Office of the Registrar) to the registrar no later than ten class days before the last day of classes of the semester in which the student returns to UW.

The entire UW transcript will remain intact. A note indicating the policy will precede the new part of the UW transcript if the student opts for academic renewal. At the discretion of the academic department in which the student is enrolled, credit hours for which the student earned the grade of C or better may be applied toward the completion of the degree requirements. The list of any departmentally-approved courses must be indicated on the Academic Renewal Application Form when initially submitted to the registrar. No further changes may be requested.

A student's GPA and completed courses that were applied to a baccalaureate degree are not eligible for academic renewal.

Graduate students are not eligible for academic renewal.

## Graduate Students

A graduate student enrolled at the university will be placed on academic probation at the end of a semester or summer session when his or her graduate cumulative UW grade point average in 4000-level or higher courses is below 3.0. Students who fail to bring their graduate GPA to 3.0 and remove themselves from probation after one semester or summer session will be suspended from the university. A suspended student may petition his/her academic program for reinstatement to the same degree program. A reinstated student will be on probation and may be subject to other performance criteria as specified by the dean of the affected department.

The above GPA requirement is considered to be a minimum requirement. Individual departments or programs may modify these minimum performance standards and establish department- or program-specific criteria for satisfactory academic progress. A graduate student may be dismissed from a degree program for lack of satisfactory academic progress, as determined by the department or program offering the degree.

The above regulations governing academic probation, suspension, and reinstatement do not apply to students enrolled in the College of Law.

# Registration and Enrollment in Courses

## Registration Procedures

Eligible students can register, drop, add, and list their courses through WyoRecords. To insure that students have seen an adviser, access numbers for each semester's registration are distributed through the academic advisers. Directions for registration are contained in the appropriate *Class Schedule*. *Class Schedules* are available online no later than one week prior to advising week. Students are responsible for following directions and deadlines contained in the *Class Schedules*.

The following categories of continuing students in good standing or on academic probation are eligible to register for the semesters indicated:

1. *For the fall semester:*
  - a. All students who were enrolled the previous fall or spring semester.
  - b. Summer session students cleared by the Admissions Office for fall. (This does not include those admitted for summer only.)
2. *For the spring semester:*

All students who were enrolled the previous spring or fall semester.
3. *For the summer session:*

Students who were enrolled the previous summer, fall, or spring semester.

All other applicants and students should complete admission requirements by the admission deadline. (Refer to the sections on undergraduate and graduate admissions in this catalog for deadlines.)

All information requested during admission and registration is important to the student and to the university and should be kept accurate and complete. If a student's address, telephone, major, adviser, or other vital information changes after enrollment, the Office of the Registrar should be informed without delay.

## Academic Adviser

Academic advising is a decision-making process involving a partnership between the academic adviser and the student (advisee). In this partnership, issues and questions regarding personal, professional, and educational goals are examined and evaluated. This includes, but is not limited to, planning an appropriate course of study and the scheduling of classes.

The purpose of academic advising is to promote rational, informed, and independent choices by the student. To that end, the academic adviser is a significant link for the student to other resources in the university community. Students are expected to take the initiative in developing the adviser-advisee relationship and to assume an ever-increasing role in developing their own academic, career, and personal goals.

## Change of Registration

Modification of a course schedule during the drop/add time period is accomplished through WyoRecords. After the end of the drop/add period, individual class withdrawals can be done by the students on WyoRecords. Changes to a student's registration or withdrawals are not official until the process is completed as prescribed.

The period of time allowed for modifying a student's schedule or withdrawing during the summer session or other special terms is established in regulations or by the registrar, subject to the approval of the vice president for academic affairs.

### During the fall and/or spring semester(s):

1. *Dropping a class or changing sections:* A student may drop classes or change sections of the same course during the first eight class days of the semester (four class days for blocked courses).
2. *Adding a course or changing grading option:* A student may add classes or change grading options or hours in variable-credit courses during the first ten class days of the semester (five class days for blocked courses).
3. *Withdrawal from a course:* After the designated drop/add period, students may officially withdraw from individual regular term courses until ten class days after mid-semester. They may withdraw from blocked courses until five class days after the middle of the course. A mark of W will be assigned indicating withdrawal.
4. *Withdrawal from the university (termination of enrollment):* A student may terminate all fall or spring semester enrollments if formal procedures are completed through the Dean of Students Office prior to the last 15 calendar days of the semester. A mark of W is assigned to each course, indicating official termination for that semester.

## Choice of College and Major

The academic adviser is an excellent source of information about the adviser's professional field for students who have selected a major. Students who are undecided about the selection of a college and/or major and who seek specialized assistance in choosing educational and vocational objectives should contact the Center for Advising and Career Services. These units have programs designed to help the undeclared student acquire the tools to make an intelligent decision regarding an appropriate major discipline.

## Change of College, Major, or Adviser

Students who wish to change their college, major, or adviser should obtain the appropriate form from either the Office of the Registrar or the office of the dean of the college of their current enrollment. Students wishing to transfer from one college to another must secure the signatures of both their present and future deans. Graduate students need the approval of the college dean and the head of the department to which the student is transferring. After all appropriate signatures have been obtained, the student should take the form to the Office of the Registrar.

Students who have completed their undergraduate work at the university and who wish to embark upon a graduate program, even through continuing their graduate work in the same field they pursued as undergraduates, will need to apply for graduate admission. (Refer to the section on graduate admission in this catalog for deadlines.)

### Definitions for Student Classifications

Code	Class	Definition by earned hours
FR	Freshman	Under 30 credits
SO	Sophomore	30 but less than 60 credits
JR	Junior	60 but less than 90 credits
SR	Senior	90 or more credits
GR	Graduate Student	
LW1	Law student (professional level) first year	
LW2	Law student (professional level) second year	
LW3	Law student (professional level) third year	
MD1	Medical student (professional level) first year	
PH1	Pharm.D. (professional level) first year (0-33 semester hours)	
PH2	Pharm.D. (professional level) second year (34-69 semester hours)	
PH3	Pharm.D. (professional level) third year (70-104 semester hours)	
PH4	Pharm.D. (professional level) fourth year (105+ semester hours)	

### Credit Hour Load

**Undergraduates:** An average of 15 hours of work each semester is considered a normal load. Maximum credit loads are 20 hours in all colleges. Normally, not more than 12 hours of undergraduate credit may be earned during the summer session. An approved Overload Petition form must be filed to exceed these maximums. Overload Petition forms are available online or from the Office of the Registrar.

**Graduate students:** 14 hours of credit is the average and 16 hours the maximum amount of credit allowed per semester for full-time graduate students. A student who has been assigned an assistantship for the academic year is usually restricted to a load of 13 semester hours. Normally, not more than 8 hours of credit may be earned in course work during an eight-week summer session. An approved Overload Petition form must be filed to exceed these maximums. Overload Petition forms are available online or from the Office of the Registrar.

### Auditing a Course

The privilege of non-credit enrollment in a class is available, upon approval of the adviser and the instructor, to any university student. The auditing privilege is subject to the same fee schedule as credit courses. Auditors are expected to attend class regularly and complete such graded work as required by the instructor. It is the responsibility of the student to determine and fulfill the requirements for a satisfactory audit. Though this auditing privilege carries full rights of class participation, it definitely offers no academic credit, does not count toward full- or part-time status, and will result in a mark of satisfactory (SA/S) or unsatisfactory (UA/U). Subsequent credit for the course by special examination is not available.

### Graduate Credit for Seniors

Undergraduate students taking graduate-level courses which are not in any way a part of their undergraduate degree have the option of later using such courses for purposes beyond the bachelor's degree requirements. If the student intends to pursue a graduate degree or needs the courses noted on the academic transcript as reserved for graduate credit for job classification (i.e. advancement on teacher salary schedules, etc.) the student should file a petition. The petition should be filed by midterm of the semester which is requested. The petition form is available on the Graduate Student Forms page on the Office of the Registrar website. Courses may not be retroactively reserved once a semester has ended.

### Repeating a Course

Students may repeat course work; however, credit earned in any given course (or equivalent course) is applicable toward a degree requirement only once. All grade entries remain on the student's record, but only the last grade earned will be calculated in the UW cumulative grade point average. Refer to the Cumulative Grade Point Average section of this catalog for further information. Variable-credit courses are not considered as repeats unless the department head provides written certification that the course content was, in fact, repeated. Courses repeated will remain as entries on the academic transcript. Courses applied towards one completed degree may be repeated as part of a second degree; however, the grade and grade point average in the original degree will not be changed. A student is limited to a maximum of three (3) attempts in any course at the University of Wyoming. An "attempt" includes any instance in which the student earns a grade for the course or withdraws from the course. The three-attempt limit does not apply to courses identified in the *University Catalog* as being appropriate for students to take multiple times. A student can petition for exceptions to this limitation through established university procedures (UW Regulation 8-238).

### Class Attendance

Each student shall attend the lectures, recitations, and laboratories, and participate in field work deemed necessary to adequately fulfill the academic requirements of each course. Each instructor, at the beginning of every semester, shall stipulate the attendance policy necessary for satisfactory completion of the course.

The Dean of Students Office may issue authorized absences for participation in university-sponsored activities and for other unusual circumstances. If students have been hospitalized, or if they have been directed by the Student Health Service or their private physician to stay at their place of residence because of illness, the Student Health Service or their private physician may issue a statement giving the dates of the student's confinement which the student may show to the instructor without verification from the Dean of Students Office.

All instructors shall permit students who have official authorized absences to make up missed course work without penalty. An authorized absence, however, merely gives the individual who missed the class an opportunity to make up the work and in no way excuses him or her from the work required.

### **Withdrawal from the University (Termination of Enrollment)**

Withdrawal from the university is the official termination of student status prior to the end of a term. Students wishing to withdraw from all on-campus classes should initiate the procedure with the Dean of Students Office. Withdrawal from the university is not permitted during the last 15 days of a term.

After clearing with the Dean of Students Office, the withdrawal form must be presented to the university cashier for initial processing. The Office of the Registrar will report withdrawals to instructors concerned.

Students withdrawing from Outreach courses should contact the Outreach School.

### **Course Withdrawal**

Students wishing to withdraw from some but not all course work can initiate the process on WyoRecords. See the Change of Registration section on preceding pages for deadlines.

A class withdrawal is not official unless filed with the Office of the Registrar. Unauthorized discontinuance of enrollment or unofficial abandonment of classes will result in a failing grade.

### **Academic Dishonesty**

Whatever form academic dishonesty may take, the university community regards it as a serious offense. An act is academically dishonest when, and only when, it is an act attempted or performed in order to misrepresent one's involvement in an academic task in any way. Such conduct will result in imposition of sanctions pursuant to University Regulations.

It is the responsibility of both the student and person in charge of an academic task, respectively, to make reasonable efforts to learn of, or make known, the expectations and standards of conduct required in the performance of an academic task. Failure on the part of the student to observe and maintain required standards of academic honesty will require corrective action by officials.



# Graduate Student Regulations and Policies

All regulations are subject to change without notice by action of various administrative officers, the University of Wyoming Board of Trustees, and the appropriate departments and divisions. Published regulations are the minimum requirements for any advanced degree.

## Admission Regulations

### Admission to Candidacy

Time spent in graduate study or accumulation of credit hours will not necessarily allow a student to become a candidate for an advanced degree. Admission to candidacy is an expression of the judgment of those who have observed the work and reviewed the credentials of the student, and deem the student worthy of the opportunity to complete the work for an advanced degree. Admission to candidacy for an advanced degree requires a specified procedure for specific degrees.

### Admission Status Categories

Advanced-degree applicants may be admitted to the University of Wyoming in one of the following categories:

Admitted Graduate Student signifies the applicant has been accepted by the university and by a major department to work toward an advanced degree.

A Graduate Student admitted with conditions signifies the applicant did not meet the formal admission requirements but has sufficient potential that the university and the major department are convinced that the student will be successful as an advanced-degree candidate. Conditions are usually placed on such students in the form of performance criteria for the first one or two semesters. If the conditions of admission are not met within the specified time period, the student may be denied admission to the university graduate program and the degree program.

The student and an adviser in the major department should monitor progress toward meeting the established conditions. The department is responsible for notifying the university when all conditions have been met.

Students should be certain they understand their admission status.

### Re-enrollment or Re-admission

Any student not registered at UW during the previous 12 months must be readmitted.

A departmental request for readmission must be submitted to the college dean in writing.

Students are required to be continuously enrolled unless a formal leave of absence has been approved.

When enrollment is interrupted for one or more years, without an approved leave, students are automatically reclassified as inactive students and must reapply for admission.

Students are encouraged to review previously submitted programs of study. Coursework older than six years old will need to be petitioned.

Students are encouraged to review previously submitted committees.

Students who do not reenroll immediately after being readmitted may become inactive again and will need to repeat the process.

## Academic Record Regulations

### Transfer Credit Available to Graduate Students

With committee and college approval, a student may submit up to a total of 12 pre-admission hours that may be a culmination of non-degree, reserved, and/or transfer hours. The total number of hours allowed from each category is as follows: 12 non-degree graduate hours; 9 transfer; and 6 undergraduate. A student may elect to utilize a combination of the three different areas to total the 12 maximum allowed (i.e. 6 non-degree hours, 3 transfer hours, and 3 reserved hours). Please review the individual sections of the catalog that cover the specific policies for non-degree hours, reserving coursework for graduate credit, and transfer credit.

To transfer hours earned at another institution to a graduate program at UW, the student must provide an official transcript from the institution where the credits were earned. This official transcript must be part of the student's permanent file. The student must also provide evidence that the course was approved for graduate credit at the institution where the course was taken.

No more than 9 semester hours that have been transferred from another accredited institution may be used for meeting the credit hour requirements of a master's student's program. Transferred hours must carry a B or better grade and will not reduce the residence requirements. Transferred credit will be subject to the approval of the appropriate major professor and the college dean and must be completed prior to approval of a master's degree program of study for which the credit is to apply. S/U or P/F transfer hours are not acceptable on a program of study.

Coursework hours approved for transfer from another college or university are considered as part of the 12-credit-hour pre-admission course limitation for master's and educational specialist students.

Hours transferred from other institutions for a doctoral program must carry a letter grade of B (3.0) or better (A=4). Doctoral (Ed.D. and Ph.D.) candidates may transfer up to 48 credit hours of such coursework, only four of which can be thesis research. Transfer hours for doctoral students are not considered as part of the 12-hour pre-admission course limitation.

### Correspondence Courses and Credit by Examination

Correspondence courses and credit by examination courses are not acceptable on graduate programs of study.

### Second Baccalaureate Degrees

A student working toward a second baccalaureate degree is subject to all regulations concerning undergraduates and is not considered a graduate student. Students requesting to reserve coursework for graduate credit must be able to complete their undergraduate degree within 12 months of the request. NOTE: Only six hours of undergraduate coursework reserved for graduate credit will be allowed for consideration in a graduate degree program.

Requirements for a second degree are considered separate from the first degree. Hours from the first master's degree may not be used for completing the hours toward the second master's. Hours from the first doctoral degree may not be used for completing the hours toward the second doctorate. Hours from an earned doctorate may not be used in a subsequent master's degree. In accordance with the academic unit's policy or the decision of the candidate's graduate committee, the hours earned toward the Ed.S. degree may, under specified conditions, be used to meet the requirements for a doctorate.

### Grade Point Average

A minimum 3.0 grade point average (GPA) is required for all coursework required for an advanced degree. Hours for which a C was earned may be balanced by a corresponding number of hours for which an A was earned. Departments and divisions have the option of indicating subject areas in which they will not accept grades of C for credit regardless of accumulated grade point average. No credit will be allowed toward an advanced degree for coursework in which a grade lower than C is earned.

A graduate student enrolled at the university shall be placed on academic probation at the end of a semester or summer session when his or her graduate cumulative UW grade point average in 4000-level or higher courses is below 3.0. Students who fail to bring their graduate GPA to 3.0 and remove themselves from probation after one semester or summer session will be suspended from the university. A suspended student may petition their academic program for reinstatement to the same degree program. A reinstated student will be on probation and may be subject to other performance criteria as specified by the dean of the affected department.

The above GPA requirement is considered to be a minimum requirement. Individual departments or programs may modify these minimum performance standards and establish department- or program-specific criteria for satisfactory academic progress. A graduate student may be dismissed from a degree program for lack of satisfactory academic progress, as determined by the department or program offering the degree.

Grades earned in coursework that are not included in the approved program of study for each candidate for an advanced degree will not be included in the accumulated grade point average to determine eligibility for an advanced degree. These courses are, however, included in the GPA as listed on the academic record if the courses are numbered 4000 or above, and are used in determining probation/suspension.

### Satisfactory/Unsatisfactory Grades

All courses taken to fulfill the requirements for the degree program must be taken for letter grade (A-F) except those courses given for S/U only.

The grade of S (satisfactory) is interpreted to include grades A-C and the grade of U (unsatisfactory) to include grades D-F on the conventional grade scale for courses numbered less than 5000 (for courses 5000 or above, the grade of S is interpreted to include grades A and B). Credit hours of S/U courses are counted as hours attempted toward graduation. However, neither the S nor U grade carries grade points and neither will be included in the calculation of the cumulative grade point average.

The faculties of the various colleges shall determine the number of credit hours of S that may be used to satisfy degree requirements in their programs. They may also place restrictions upon the use of S

credits to satisfy college or major requirements. In addition, they may designate particular courses in their colleges as courses to be offered for S/U only.

The grade of S in thesis and dissertation research is a judgment that the student is adequately engaged in the required research objective. It in no way implies that the final thesis or the thesis defense will be judged of sufficient quality for the award of the appropriate degree.

### Incomplete Grades

The incomplete grade (I) is a temporary grade used under circumstances where awarding a grade would be unjust or not reflective of the student's actual performance in a course. An incomplete grade may not be assigned unless accompanied by a written authorization. Time allowed for completing course requirements will normally not exceed 120 calendar days beyond the end of the semester in which the I was given. The dean of a college may designate certain research courses where the 120-day limit may be extended by the instructor.

The I will revert to an F if the final grade for the course is not received in the Office of the Registrar by the date indicated on the authorization. Students receiving an incomplete in any course(s) listed in their program of study must have the incomplete removed by the end of the semester in which they turn in their intent to graduate. If the incomplete is not removed, the student will not graduate that semester.

### Academic Dishonesty

Academic dishonesty and scholarly misconduct will not be tolerated. Academic dishonesty is an act attempted or performed that misrepresents one's involvement in an academic task in any way, or permits another student to misrepresent the latter's involvement in an academic task by assisting in the misrepresentation (UW Regulation 6-802).

If academic dishonesty has been established, the offending student shall receive a failing grade for the course in question. If two such acts have been recorded at different times or in different courses, the student shall be suspended from the university in accordance with UW Regulation 6-802. These actions shall not preclude the imposition of other sanctions by university officers including the loss of benefits from programs, scholarships, and other opportunities normally afforded students.

### Degree Revocation *UW Regulation 8-254*

The University of Wyoming is a state higher education institution whose Trustees are legislatively empowered to confer degrees on students who have earned them, upon the recommendation of the faculty. The Board of Trustees recognizes that there may be instances where a degree is awarded to an individual who, upon review, has not properly completed all requirements for the degree. In such instances, the Board of Trustees may revoke the degree. This regulation establishes the process for such revocation.

Grounds for revoking a degree include convincing evidence that the degree recipient failed to complete the requirements for the degree that were in effect at the time of the degree conferral. Included in this category is evidence that the candidate engaged in academic misconduct serious enough to negate bona fide completion of one or more substantive degree requirements. Additional information can be found at [http://www.uwyo.edu/generalcounsel/\\_files/docs/UW-Reg-8-254.pdf](http://www.uwyo.edu/generalcounsel/_files/docs/UW-Reg-8-254.pdf).

**Course Numbering for Graduate Credit**

Courses offered for graduate credit are distinguished by number as follows:

4000-4999 are primarily for junior and senior students, but also may be used as part of some graduate programs of study  
5000-5999 are primarily for graduate students

Courses numbered 5000 or above may be taken by undergraduate students having the necessary prerequisites. If a course is filled, graduate students will have preference and undergraduates may be asked to relinquish their place in the course. Graduate students may enroll in courses numbered 1000-3999 to remove undergraduate deficiencies, but only those numbered 4000 and above will be computed into the graduate GPA and be allowed for graduate credit.

**Dual listed Courses**

If a course is dual listed at the 4000/5000 level, the course must be taken at the 5000 level to receive graduate credit regardless of whether the course is in the student's primary program area.

The syllabus for a dual listed course must specifically differentiate expectations, outcomes and assessment between the 4000 and 5000-level components, clearly describing the additional effort needed for graduate level credit. This may include but is not limited to intellectual skills, discipline-specific competencies and challenging learning outcomes. For example, students enrolled in the 5000-level course may be required to lead discussion sessions, submit a portfolio, write a paper or may be involved in a service learning component, internship or collaborative assignment designed to provide experience in applying course information in different contexts.

Students enrolled in the 5000-level course will be expected to demonstrate greater sophistication in content expertise, inquiry, creativity, communication, problem solving, analytic reasoning and/or collaborative learning compared with those enrolled in the 4000 course.

**Courses Not Applicable Toward Advanced Degrees**

Only courses at the 4000 or 5000 level may be counted for graduate credit. However, some 4000- and 5000-level courses may not be applicable toward undergraduate or graduate degrees. These courses are listed below:

\*\*\*\* 5959. Enrichment Studies in \_\_\_\_\_. (Any course numbered 5959 is not applicable toward UW degrees.)  
EDUC 4740. Field Studies in \_\_\_\_\_. (Any course in the College of Education numbered 4740 is not applicable toward UW degrees.)  
CNSL 5740. Continuing Education in \_\_\_\_\_.  
KIN/HLED 4074. Field Studies in \_\_\_\_\_.  
HLED 4970. Field Experience in Health Education.

**Non-Degree Hours**

A student may request that up to 12 hours of graduate-level coursework, taken during the student's graduate, non-degree status, be used toward a program of study should the student choose to pursue a graduate degree at the University of Wyoming. This would be subject to the approval of the student's graduate committee and the college dean. These hours can be affected by other pre-admission hours.

**Outreach Courses**

Outreach courses, to carry graduate credit, must satisfy achievement criteria acceptable to the Office of the Registrar and must be taken under the auspices of UW, or involve study completed at an off-campus center.

**In-Residence Coursework (Residency)**

In-residence coursework includes courses and/or research work on the UW Laramie campus, at an approved UW off-campus course site, and/or research work done for credit in the field under the direction of a UW faculty member.

The minimum number of semester credit hours that must be earned on the UW Laramie campus or at an approved UW setting for a particular degree program shall be determined by the individual colleges. In no case shall these minimum numbers of credit hours be less than 21 hours beyond the bachelor's degree for the master's degree, 21 hours beyond the master's degree for the educational specialist degree, or 24 hours beyond the bachelor's degree for the doctoral degree.

In computing the in-residence requirements for the Plan A thesis and doctoral degrees, credit earned working on the thesis or dissertation shall apply.

**Limitation of 4000-level Coursework Hours**

Beginning with students admitted to the spring 2007 semester, only 12 credit hours of 4000-level coursework will be permitted on the graduate program of study.

**Repetition of Courses**

No more than two courses (total of six credit hours) available for graduate credit may be repeated by students at the graduate level. This regulation does not apply to those courses carrying variable credit (e.g., research or independent study). Variable credit courses are considered repeated only when so certified in writing by the instructor and the registrar.

**Time Allowance and Limitations**

Master's students and educational specialists have six calendar years to complete their degrees from the beginning of the first course taken and listed on the program of study. Doctoral candidates have four calendar years after the successful completion of their preliminary examination to complete their degree.

**Continuous Enrollment**

Once admitted, all degree seeking graduate students must maintain continuous enrollment. Unless a formal leave of absence is approved, all students should maintain at least one hour of continuous enrollment in the semester or session they expect to receive the degree. Students should maintain enrollment for two of the three academic semesters. Reactivation will be required if the student has not enrolled in classes within the previous 12 months. Contact your department to investigate your status. The department will contact the Office of the Registrar to initiate reactivation. Students who have been inactive for a long span of time should also investigate the status of their committees, programs of study, and time to degree status. If a summer-to-summer only enrolling student intends to finish his/her degree and graduate during a fall or spring semester, he or she must be enrolled for the appropriate number of hours, as required of all students, during the semester of intended graduation. International students' enrollment status is monitored by the office of International Students and Scholars and the office should be contacted for more information.

**Research, Investigations, or Independent Study**

Courses such as Individual Problems; Special Problems; Research in .....; Investigations in .....; etc. may not be used to develop information or material that will be submitted as a thesis or dissertation.

## Reserving Coursework for Graduate Credit

Approved graduate level courses taken prior to completing the baccalaureate degree, but not part of that degree's requirements, may be applied to the master's or doctoral program with the approval of the student's committee. Approval for reserving the coursework is rendered jointly by the adviser and college dean, and applies only to courses taken within 12 months of completion of the baccalaureate degree.

If a course is dual listed at the 4000/5000 level, the course must be taken at the 5000 level to receive graduate credit. Each 4000- or 5000-level course must be reserved for graduate credit by completing the Request to Reserve Coursework for Graduate Credit form, obtained online at [www.uwyo.edu/uwgrad](http://www.uwyo.edu/uwgrad). The form must be completed and submitted to the Office of the Registrar prior to the semester or Summer Session in which the coursework is taken.

These courses will appear on the undergraduate transcript with a notation that they have been reserved for graduate credit.

NOTE: Students will only be allowed to transfer six hours of coursework that has been reserved for graduate credit into their degree program.

## Petitions and Appeals

The University of Wyoming, as a fully-accredited public institution of higher education, must comply with general laws, regulations, and principles of fairness, uniformity, and accountability. Exceptions to uniform application of general regulations are justified only in extraordinary circumstances. Exceptions to regulations may be petitioned by submitting the appropriate form to the college dean. If any of the signers recommend that the petition be denied, the registrar may deny the exception, make further inquiries, or refer the matter to the provost for direction. If all the signers recommend that the exception be granted, the registrar may concur (and process the exception) or may deny the exception and refer the matter to the provost for direction. If the petition is denied by the registrar, the student may elect to pursue the petition with the provost.

The Graduate Student Appeals Board (GSAB) was established to provide an appellate body to review appeals of graduate students concerning retention in graduate programs, employment as graduate assistants, and charges of academic dishonesty or scientific misconduct. The GSAB will not hear appeals of course grades or charges of academic dishonesty associated with a course (these appeals will be handled by the procedures of the college in which the course is offered). Appeals emanating from Plan B, thesis, or dissertation research will be heard by the GSAB even though thesis and dissertation research are designated by course numbers. Policies and procedures for graduate student appeals are modeled after those used by the University Board of Student Appeals.

The GSAB will not hear appeals of course grades or charges of academic dishonesty associated with a course other than a research course, e.g. thesis, non-thesis, or dissertation research. Policies and procedures concerning appeals may be found on the Graduate Student Resources web site.

## Degree Completion Regulations

### Declaring a Graduation Date

An Anticipated Graduation Date form must be filed for the semester in which graduation is planned. This form puts the student on the list for graduation. If graduation does not occur during the projected semester, the student must submit a new form no later than the deadline date for the new final semester. By the designated deadline, students who are entering their semester of graduation should:

- Pay their associated graduation fees (diploma and/or certificate fee plus the digitizing fee if thesis/dissertation is involved) and retain receipt.
- Download the Anticipated Graduation Form from the Office of the Registrar Web site.
- Submit to the Office of the Registrar

If discrepancies are found during the degree check, the Degree Analyst will contact the student/chair with instructions for resolution.

Following the student's defense, the student will submit a signed Report on Final Examination form to the Office of the Registrar. All students whose programs require a Thesis/Dissertation must submit the document to ProQuest before the last day of classes. Once the final examination period is over, Degree Analysts will review the degree evaluation to verify that any discrepancies have been corrected, final grades on any remaining coursework have been posted, and all required forms/documents have been submitted. Once all requirements have been met, the degree will be awarded.

### Program of Study

Unless otherwise specified, each student must submit a program of study to the Office of the Registrar for approval. The program of study form is available online at [www.uwyo.edu/uwgrad](http://www.uwyo.edu/uwgrad). Return the completed form with all required attachments to the Office of the Registrar. Degree Analysts will transcribe the program into a degree evaluation, which constitutes an agreement between the student, the student's committee, and the university wherein the minimum coursework requirements for that student's degree are listed. The program should be filed no later than the beginning of the student's second semester (or second Summer Session if enrolling only in summers). No master's student will be a candidate for a degree until his/her program is approved by the head of the appropriate department and the college dean. Master's degree candidacy occurs with the approval of the program of study. Candidacy in the doctorate occurs upon certification of successful completion of the preliminary examination.

Some degree programs require more hours of credit than the minimum requirement of the university. Students should consult their advisers as well as the college and department sections in this catalog. The program filed must include the appropriate minimum number of semester hours of graduate credit required. Changes to the approved program must be petitioned on the Office of the Registrar's Request for Change in Graduate Program form.

## Examinations

Examinations may be required of any graduate student or advanced-degree candidate at such time or of such nature as the department or the student's graduate committee may require. It is standard procedure for doctoral students (Ph.D. and Ed.D. students) to be given a preliminary examination, and for final examinations to be conducted for both master's and doctoral students. It is common for the nature of these exams to differ from one academic unit to another.

### *Preliminary Examination*

The preliminary examination will be held at least 15 weeks prior to the final examination. The preliminary examination may not be given before: (a) the research tool requirements, if any, have been met and certification approved;

(b) at least 30 hours of coursework have been completed; and (c) the doctoral program of study has been approved. The format and conduct of this examination shall be the responsibility of the student's committee, in line with any departmental policies (see specific department).

Following the completion of the departmental preliminary examination, the Report on Preliminary Examination must be submitted to the Office of the Registrar regardless if the student passed or failed. The favorable vote of the majority of the student's graduate committee members will be accepted as passing. In case of failure, the student may attempt the examination once more after not less than one nor more than four semesters have elapsed. When the preliminary examination has been successfully completed, and the report of the committee is on file in the Office of the Registrar, the student is considered a doctoral student admitted to candidacy for the degree. At this time, the doctoral candidate has four years to complete the degree process.

### *Final Examination*

The final examination may not be held until after the beginning of the semester or session in which coursework is completed. Two weeks before the final examination, please make public the proposed date, time and place of the examination. The committee may require the candidate to take a written examination as well as an oral examination. The oral and/or written examination should be held by the student's graduate committee **at least 10 days before the end of the term of graduation.**

The written vote of each member of a candidate's committee must be on record in the Office of the Registrar on the Report of Final Examination form, indicating the majority of the committee members' approval, before any candidate will be recommended for an advanced degree. A student failing his/her final examination may retake the examination once after a reasonable period of time has elapsed.

### **Graduate Committee**

A student's graduate committee is appointed by the college dean and is based on the recommendation of the department or division chair or head. The committee functions to guide the student in coursework selection, the degree project construction, and requirements completion of the degree. All committees will have at least one member from the appropriate department/division as chairperson and a member from outside the major department/division.

The Master's committee, usually constructed by the student and his or her major professor in consultation with the department chair or division head, consists of at least three members: the chair of the committee (the major professor) from the appropriate department or division, a faculty member of a department or division other than the one awarding the degree (the outside member), and a third committee

member who is usually from the student's home department, program, or division. An individual with an off-campus affiliation, an external committee member, may serve as an optional, fourth voting participant in a Master's committee with the approval of the major professor and the department head or departmental designee. The external member of the committee is a faculty member at a peer institution or an individual holding professional expertise that will contribute to the committee. Such an appointment pertains exclusively to work on the Master's committee and assumes that the external member would be able to participate fully in the essential components of the degree-granting process. The external member cannot replace the outside member.

Educational specialist committees consist of at least a member of the faculty from that same department, and a member of the faculty from outside the major department. The educational specialist's committee must have three members and will ordinarily not have more than five members.

Doctoral committees will consist of at least five members, no fewer than three of whom must be from the candidate's major department or division. Every committee must designate a committee chair (the major professor) and an outside member both of whom must be members of the UW faculty. The outside member is defined as a UW faculty member holding an appointment in a division or college other than the one in which the candidate will receive the Ph.D. degree. An individual with an off-campus affiliation may serve on graduate committees as an external member with the approval of the major professor and the department head or departmental designee. The external member of the committee is a faculty member at a peer institution or an individual holding an earned doctorate whose expertise will contribute to the dissertation committee. Such an appointment pertains exclusively to work on the dissertation committee and assumes that the external member would be able to participate fully in the essential components of the dissertation process. The external member cannot replace the outside member.

The committee will serve in an advisory capacity for development of the student's coursework and research programs and must approve the official program of study filed with the Office of the Registrar. The committee will also determine pass or fail on the preliminary examination, approve or disapprove the dissertation or project report, and will conduct the final examination.

The doctoral committee must be on file with the Office of the Registrar before the program of study form is submitted. Changes in committee membership or major professor assignment can be requested at any time by the department/division head. This is normally done in consultation with the student and committee chair.

### **Language or Other Tool Requirements for Doctoral Candidates**

The prospective Ph.D. student should refer to the specific department in which he/she desires to major to ascertain what languages or research tools are required. Certification of a language or tool, if required, will be made by the appropriate agency or department of the university to the Office of the Registrar when proficiency requirements have been met to fulfill the tool requirements. Students may demonstrate proficiency on a standardized language examination prepared by the Educational Testing Service, or by receiving at least a grade of B in a course (or courses) specified by a department on this campus or on a reading test administered by the department. It will be each student's responsibility to see that certification of proficiency for tool requirements is made. Coursework certification may be made from transcripts filed by the student with the Office of the Registrar.

### Report on Final Examination

This form provides documentation from the student's committee that the student has passed the Final Examination/Defense. If applicable, it also indicates the committee has approved the thesis/dissertation and the student agrees to make publicly available via ProQuest. This form must be on file with the office of the prior to graduation.

Students wishing to embargo/copyright or otherwise delay release of their thesis/dissertation must have previous authorization of the college dean on file in the Office of the Registrar.

### Survey of Earned Doctorates

The university requires the Survey of Earned Doctorates provided and the certified RFE form on or before the date established by the Office of the Registrar for fulfilling the requirements for advanced degrees each semester. The survey (for registration with the National Research Council) is available on the Graduate Student Resources Web site. All Ph.D. students must complete this survey.

### Thesis or Dissertation

The candidate shall submit an electronic thesis or dissertation showing by its form and organization the candidate's ability to write acceptably and use the language. The thesis or dissertation must be approved by the student's graduate committee. Approval shall be indicated using the Report of Final Examination form. No attempt will be made to evaluate the thesis or dissertation in terms of credit hours. The thesis or dissertation must meet the standards established by the University Libraries, ProQuest Information and Learning, and be approved by the committee chair. It must be submitted to the candidate's committee at least three weeks prior to the final examination. The thesis or dissertation must be available for inspection by any other member of the faculty who may wish to examine it.

### Digitizing Requirement

All graduate students accept as a condition of enrollment that completed theses and dissertations will be published through ProQuest Information and Learning. This involves a special fee. The appropriate form for submitting the thesis/dissertation is available when submitting the project electronically through ProQuest Information and Learning.

### Patenting or Copyright by UW

In some cases, where significant university funds or resources have been used in dissertation research, the university may claim an interest in patenting or copyrighting the results. When this seems likely, the student (or the student's major professor) should consult with the college dean or the vice president for research.

### Classified or Proprietary Research

The process of research in graduate education is one of free and open inquiry involving the student and faculty. Final examinations for graduate degrees are open to all faculty, and theses and dissertations are accessible to the public upon acceptance by the university unless embargoed as approved in advance.

For the purposes of this policy, classified research is defined as research that has a security classification established by a federal agency. Classified research projects also require approval of the trustees before being initiated. Proprietary research is defined as research for which the sponsor requires a delay in publication.

With the foregoing principle and definitions as guidance, the following policies will be used regarding use of classified and proprietary research for theses and dissertations:

Classified research cannot be used for a thesis or dissertation.

Proprietary research may be used for theses and dissertations. However, any delay caused by the proprietary nature of the research must be alleviated before the thesis or dissertation is submitted to the Office of the Registrar. Such delays cannot exceed six months without the approval of the college dean. Delays greater than 12 months in length will be approved only in unusual circumstances unless embargoed as approved in advance by the college dean. Sponsors of proprietary research should be aware that theses and dissertations are accessible to the public upon acceptance.

### Format for Utilization of Journal Articles in Thesis and Dissertations

The master's thesis and doctoral dissertation are integral components of the graduate learning experience. Writing the thesis or dissertation not only sharpens vital communication skills but also provides the opportunity to expand upon research detail, include unpublished results and engage in creative speculation and synthesis of research outcomes to a degree greater than normally allowed by journal editors.

For many disciplines, publication of student research in peer-reviewed journals is a hallmark of successful graduate education. It validates the significance of the scholarly results and is beneficial for student, mentor and the institution. To encourage publication of thesis or dissertation results and to avoid requiring degree candidates to recreate thesis or dissertation chapters from peer-reviewed publications, the university permits the utilization of published papers as the foundation for theses and dissertations subject to the following conditions:

The publications must be refereed and must have been accepted for publication in scholarly journals of high quality. The source should be cited in the comprehensive introductory chapter.

The publications must be written by the student. Editorial oversight by the mentor and committee is allowable and desirable; however, the mentor and committee have the responsibility to ensure that the student is the main author.

If there is more than one publication, the articles submitted must form a coherent whole, having a well-defined intellectual focus and advancing novel contributions along a clearly identified line of inquiry.

For multi-authored articles, the contribution of each author must be clearly stated in the preface or introduction to the thesis or dissertation.

A comprehensive, cohesive and coherent introduction and discussion must be incorporated as separate chapters. These chapters should summarize the current state of knowledge and the rationale for the research. They should clarify how each chapter is interconnected and provide a meaningful synthesis and discussion of chapter results as part of a coherent whole.

Appendices can be attached to include expanded methodology, unpublished data, tables, etc. Where appropriate, the appendices may be in electronic formats, provided the data are readily accessible to the international scholarly community.

An abstract is not sufficient to address these criteria.

## Graduate Degree Regulations

### Master's Candidates

The functional and contractual document for the individual student master's degree is the program of study. It includes a declaration that the student will pursue a particular project plan: either a Plan A thesis or a Plan B non-thesis. Once the program of study has been approved for a master's student, the student advances to candidacy. After the student's program of study has been filed with the college, the approvals of the major professor and the college dean are required to transfer from one project plan type to another. If such a change is made, some credit under the original program of study may not meet requirements of the new program of study. The master's program of study, whether a declared thesis or non-thesis project plan, must include a minimum of 30 hours of graduate credit.

Current policy specifically requires a culminating defense for Plan A master's programs but does not address a similar requirement for non-thesis, Plan B programs.

Recognizing that plan A and B programs are academically equivalent and that a capstone event is an integral component of the graduate learning experience. Plan B programs also require an oral defense.

The defense structure and format is flexible but it should allow opportunity for the student to demonstrate content comprehension and application, critical and quantitative analysis, creative thinking, problem solving, synthesis and evaluation.

Following the defense, regardless of the outcome, the student will submit a Report of Final Examination form to the Office of the Registrar. This form is available on the Graduate Student Resources Web site.

### *Plan A Master's*

This program type must reflect a minimum of 26 hours of acceptable graduate coursework and four hours of 5960. Thesis Research. The Plan A thesis option accommodates original research, although the degree of originality and the definition thereof is sometimes program specific. The planning, development, and production of the thesis is guided by the committee chair and the graduate committee.

The thesis is the final, written product of the project. General required guidelines for preparing a thesis are available in the "Thesis and Dissertation Format Guide." The thesis must be submitted to the student's committee at least two weeks before the intended date of final examination. To finalize the master's program and project, an electronic copy of the thesis is submitted to ProQuest and the Report of Final Examination is on file in the Office of the Registrar.

The electronic copy must meet the standards established by the faculty and those of the University Libraries. This copy submitted to ProQuest will ultimately be deposited in the University Libraries. Each student should normally plan to produce at least three copies of his/her thesis: one for the thesis director, one for the department, and one to retain for personal use.

### *Plan B Master's*

This program type carries a minimum of 30 hours of coursework, but some variants require more than 30 hours of credit (see specific program requirements in this catalog). At least 14 of these hours must be in the student's major field. The student's committee in specific programs may modify this requirement. The Plan B non-thesis program type differs from the thesis program type in that it may include additional hours of coursework instead of thesis hours. It permits a wider distribution of courses and permits a wider array of possible final products than the Plan A thesis program type. For example, the Plan B project may resemble a thesis, but the topic is not research or original. The non-thesis project may take the form of a business plan or a professional portfolio. The Plan B project can, but does not have to, be a paper (see the next section). Each academic unit that engages in Plan B non-thesis activities often has its own set of principles that guide students in that unit.

Most, but by no means all, of the academic units that have students pursuing master's degrees in the Plan B non-thesis category have the students prepare a paper, or sometimes two papers, as their final project. In the selection of a subject and preparation of the paper(s), the student shall be guided by the adviser or, in some academic units, by the instructor(s) in charge of the course(s) connected to the paper(s). The paper(s) should present the results of study and at a level of scholastic quality commensurate with a Plan A thesis project. The Plan B non-thesis is different from the Plan A thesis in that it is not an in-depth research project. The student and his or her adviser often, but not always, decide if a project will be Plan A or Plan B. Academic units have principles that guide students in this selection. Many units have rules that precisely dictate the type of program and project a student can conduct.

The format for the Plan B non-thesis paper should follow that of the Plan A thesis. However, Plan B non-thesis paper titles do not appear on the student's transcript, whereas, Plan A thesis titles do; further, Plan B non-thesis papers are not filed in the University Libraries and they are not submitted to ProQuest. They are filed with the major academic unit.

Students pursuing the master of arts in teaching or the master of science in teaching should follow the regulations listed under the specific requirements for the master's degree with the minor modifications listed below.

### **Other Master's Programs**

Some Master's programs require additional coursework in place of the thesis. These programs include the Master of Business Administration (42 hours) and the Master of Public Administration (39 credits). These programs may also have different requirements pertaining to graduate committees and do not require the submission of a program of study.

### **M.A.T./M.S.T. Degrees**

Candidates for the M.A.T. or the M.S.T. should have completed the requirements for teacher certification prior to application for admission to graduate study. In exceptional cases, however, applicants may be admitted to graduate study even though they fall short of certification requirements. The M.A.T./M.S.T. program is completely separate from the certification requirements. Hours used to meet certification requirements cannot be applied toward the M.A.T./M.S.T. degrees.

The M.A.T./M.S.T. degrees are only modifications of the Plan B non-thesis option and are subject to the requirements of the admitting department and the general requirements of the faculty.

At least 24 of the 30 semester hours required must be in a particular teaching area (e.g., chemistry, history, etc.), with at least 12 hours in one department. A student working jointly in two departments must take at least 12 hours from each department.

The M.S.T. is designed for one teaching area and must include 18 hours in, or the total required by, that area. A program designed for two teaching areas must include 12 hours in, or required by, each of the specified two areas. Courses offered by the Science and Mathematics Teaching Center do not constitute a separate area in themselves but may be applied to an appropriate area. A program designed for two teaching areas must be approved by the heads of both departments, and the graduate committee for this program must include one member from each department. The M.S.T. is intended for individuals teaching at the secondary level. The program should represent the student's needs.

### **Doctor of Philosophy Candidates**

The doctor of philosophy degree does not represent a specified amount of work over a definite period of time but rather the attainment of independent and comprehensive scholarship in a particular field. Such scholarship will be manifest in a thorough acquaintance with present knowledge and a demonstrated capacity for research. The fulfilling of the following requirements suggests, therefore, only the minimum task one must undertake to earn the doctor of philosophy degree. No amount of time spent in graduate study or accumulation of credit hours entitles the student to become a candidate for this degree.

The program of study must include a minimum of 72 semester hours of credit at the 4000 level or above from UW or equivalent levels from another approved university. This 72-hour requirement may include graduate credits earned while working toward the master's degree in the same area, but at least 42 hours (of the 72) must be earned in formal coursework. Additional credits toward the 72-hour requirement may include additional formal course credits, 5980 Dissertation Research, or 5990 Internship. The program must be on file in the Office of the Registrar before the preliminary examination can be scheduled.

### **Educational Specialist Candidates**

***(These programs are currently under review)***

Coursework leading to the educational specialist degree has been designed for persons who desire additional preparation beyond the master's level but are not interested in pursuing a doctorate.

The program of study must include a minimum of 30 semester hours, 15 of which must be in the student's area of specialization. Six of the required hours must be in the form of specifically designated professional activity in education (such as supervision, administration, research, classroom experimentation, or technical assistance) and must be directed and supervised by the student's major professor or a designee. Approval of the program of study for an Ed.S. student is the admission to candidacy. In accordance with the academic unit's policy or the decision of the candidate's graduate committee, the hours earned toward the Ed.S. degree may, under specified conditions, be used to meet the requirements for a doctorate.

A written report must be submitted concerning the specifically designated professional activity. The graduate committee will evaluate the report for competency in English expression, organization, and significance of the contribution to the student's field of specialization. This report will also serve as a basis for the final oral examination and must be filed with the student's major professor.

Each doctoral student must furnish satisfactory evidence of having had three years of successful professional experience. This experience may be in teaching or administration or both. The student's graduate committee will determine what experience shall be required and when this requirement has been satisfied.

### **Doctor of Education Candidates**

The degree of doctor of education (Ed.D.) is offered to competent students who wish to pursue a program of studies and to participate in appropriate activities in preparation for professional service in teaching, administrative, and supervisory positions in education. The program is designed to meet the needs of those for whom intensive research is not a practical prerequisite to vocational goals. Doctoral students are expected to participate not only in organized coursework but also in informal types of activities that will insure breadth of outlook and technical competence.

Each doctoral student must furnish satisfactory evidence of having had three years of successful professional experience. This experience may be in teaching or administration or both. The student's graduate committee will determine what experience shall be required and when this requirement has been satisfied.

At least 36 semester hours must be earned in the major field. The degree requires a minimum of 72 graduate hours (beyond the bachelor's degree) to complete all requirements. In addition to the program of studies in organized coursework, the doctoral student will be required to complete an approved applied project report or dissertation within the major field of professional specialization.

A student who has taken a major part of his/her undergraduate and graduate training at UW may be required by his/her graduate committee to do a specified portion of graduate work at some other institution. The program must be on file in the Office of the Registrar before the preliminary examination can be scheduled.



## Miscellaneous Regulations

### New Parent Accommodation Policy

The University of Wyoming is dedicated to ensuring optimal success for all graduate students. However, new parents are frequently forced to interrupt their education cycle, sometimes in a transient manner but often permanently.

The New Parent Accommodation policy is designed to allow new parents to maintain full-time, registered student status and facilitate their return to full participation in graduate activities in a seamless manner without penalty. The policy applies to full-time students enrolled in a graduate program. If both members of the new parent partnership are UW graduate students, one but not both will be eligible for the full accommodation. However, university encourages accommodation of schedules for exams, assignments and programs of study for the graduate student partner. This accommodation does not apply to part-time students.

A student anticipating becoming a new parent is eligible for accommodation consideration for a period of up to one semester. The exact accommodation period will begin on the date specified on the New Parent Accommodation petition approved by the college dean. This petition must be filed and approved prior to the actual date of childbirth or adoption. Additional information can be found at [www.uwyo.edu/uwgrad](http://www.uwyo.edu/uwgrad).

### Armed Services

Time spent in the armed services is not computed in the total time allowed to complete the requirements for an advanced degree; however, students who are eligible and wish to use this time exclusion must file the leave of absence petition.

### International Students

Upon arriving at the University of Wyoming, international students are required to visit the International Students and Scholars (ISS) office. This office:

- provides support and counsel for UW's international students and scholars population regarding aspects of immigration regulations and procedures,
- orients this population to the policies and expectations of the university, the educational system, and the U.S. culture,
- hosts a mandatory orientation program for all new international students before the beginning of each semester.

Please see the ISS Web site for detailed information ([www.uwyo.edu/iss](http://www.uwyo.edu/iss)).

International graduate assistants with teaching responsibilities must complete the English Proficiency Assessment Program and must participate in the Graduate Student Teaching and Learning Symposium. Check the Graduate Student Resources Web site ([www.uwyo.edu/uwgrad](http://www.uwyo.edu/uwgrad)) for dates and times.

# Graduation Requirements and Procedures

## Graduation Requirements

Students are personally responsible for knowing degree requirements and enrolling in courses that fulfill their degree program. Students, with the help of their advisers, design their program to satisfy their needs and aims. Students will be required to complete assessment activities as determined by the university prior to the awarding of degrees. Students are likewise held responsible for knowing regulations governing the standard of work required for continuance in the university involving academic probation and suspension.

Although this catalog is intended to set forth the various provisions for study and requirements for the awarding of degrees, periodic revisions of the provisions for study and degree requirements are appropriate (because of advances in knowledge, changes in occupational requirements, academic preparation of students, and in faculty and facilities at the university). In order for the catalog to be available in spring of each year, publication must begin the previous October. This is almost a year before the requirements specified therein become effective the following fall and almost five years before a student entering at that time could graduate. Accordingly, the university cannot guarantee the awarding of a degree based on the unchanged requirements as set forth in a particular catalog.

## Graduate Student Requirements

Graduate students must declare a graduation date. Anticipated Graduation Date forms may be submitted at any time, but should be submitted as early in the term of graduation as possible. A Program of Study/degree evaluation, and Committee Assignment (if required) and Preliminary Examination Results forms (doctoral students only) must be on file before the Anticipated Graduation Date form will be processed. Upon receipt of the form, your Degree Analyst will verify that all course requirements have been met. If discrepancies are found, the Degree Analyst will contact you with instructions on how to resolve them. Your Degree Analyst will also verify that you have registered for a minimum of one semester hour for the current semester. If you have questions, please contact the appropriate Degree Analyst.

## Prepare for your Defense

A formal public announcement of thesis and dissertation defenses is required. Contact your department for specific procedures.

Prior to the defense, complete the Report of Final Examination form and take it to the defense.

## After the Defense

Following the defense and when all committee signatures have been secured (note: committee chairs may delay signature until all necessary changes to the thesis/dissertation/non-thesis paperwork have been made and approved), submit the form to the Office of the Registrar.

After submission of the Report of Final Examination Results form indicating all changes/revision have been made and the thesis/dissertation is approved for final submission, student will submit the document for format review and final electronic publication to ProQuest. You will be advised if additional corrections are required.

If you have not previously done so, pay your graduation fees online or at the Cashier's Office, Knight Hall 170 by the last day of classes for the semester.

Ph.D. students only: Complete the NORC national survey of doctoral students. This is done using the Survey of Earned Doctorates on the NORC website. At the end of the survey, you will be prompted to send an email indicating completion of the survey. Please send this email to registrar@uwyo.edu.

## Adjustment to Changing Requirements

Students are expected to inform themselves of changes in degree requirements by reviewing the catalogs that are published annually and their Degree Evaluation reports; then, when necessary, adjust their degree plans accordingly.

If university or college requirements are changed, students are encouraged to adopt the new requirements; however, students will have the option of graduating under the requirements in effect when they entered the university or one of Wyoming's community colleges, provided the courses are still available. The student must accept either the new requirements or the requirements in effect when they entered the university or one of Wyoming's community colleges in their entirety, not a combination from each. Students changing colleges within the university or reentering the university after one or more years away are expected to adopt the requirements in effect at the time of the reentry. Any substitution to the above must be approved in writing by the student's adviser and the college dean and added to the student's advising folder in the department or college.

If departmental requirements are changed, students will ordinarily be permitted to continue under the requirements in effect when they entered that major department provided there has not been an interruption in their education for a year or more; however, students are encouraged to adopt the new requirements in total, or to accept, with the written approval of the student's adviser within the department, those of the new requirements which would not be an undue hardship. Notice of changes will be available from departmental offices and advisers. It is the responsibility of students to keep in touch with their major departments, to learn of changes in requirements, and to plan ahead so that necessary courses can be taken by the expected time of completing a degree. Many courses are not given every semester and some not every year.

If required prerequisites for a course are changed, notice may be obtained from the department offices. The university cannot continue two courses, one with and one without a newly-adopted prerequisite. The student must therefore meet the new prerequisite or obtain permission from the instructor to enroll in the course. In the event of any doubt as to the adequacy of preparation for a course, the student should consult with the instructor or an adviser in the department as far in advance as possible. Independent study, if approved, may be accepted in lieu of a specific course prerequisite.

## Scholarship Standards

A UW cumulative grade point average of at least 2.000 is required for undergraduate degrees. The cumulative grade point average is defined as the sum of all grade points earned in residence, correspondence study, or outreach at the University of Wyoming, with the following exceptions:

1. The credit hours shall not be counted in courses in which marks of W, S, or U were assigned, or in which marks of I (for incomplete) are still in effect.
2. For repeated courses:
  - a. First repeat: only the second credit and grade is used to calculate the cumulative GPA.
  - b. If repeated more than once, only the last grade is used to calculate the cumulative GPA.
  - c. If a mark of W, S, or U is assigned in a repeated course, the previous grade assigned will stand except when an S or U is earned repeating a previous S or U.
  - d. Courses applied towards one completed degree may be repeated as part of a second degree; however, the grade and GPA in the original degree will not be changed.
3. Transfer grades are not counted in the UW GPA. If a course taken at UW is repeated for the first time at another institution, the credits and grade earned at UW will be deleted from the UW cumulative GPA if credit for the repeated course is transferred to UW.
4. For graduate students, courses numbered below 4000 are not added into the semester and cumulative totals, nor computed into the GPA.

## University Studies Program

Students who entered the University of Wyoming, one of Wyoming's community colleges, or an out-of-state academic institution fall 2015 or later, are required to complete the University Studies Program 2015, a university-wide program in general education. The detailed requirements for the University Studies Program are provided in this catalog on page 54.

## Semester Hour Requirements

*Completion of the total minimum credit hours for degrees from the various colleges is indicated below:*

College of Agriculture	120-128 hours
College of Arts and Sciences	121-132 hours
College of Business	120 hours
College of Education	120-128 hours
College of Engineering	128-132 hours
College of Health Sciences	120-142 hours

These minimum hour requirements are in line with the higher learning commission's criteria for accreditation.

## University Requirements

1. A cumulative GPA of 2.000 or better from the University of Wyoming.
2. Satisfactory completion of the prescribed curriculum in which the degree is sought, including fulfillment of the entrance requirements in the college concerned.

3. Students must complete a minimum of 42 upper division (junior/senior) or graduate-level semester credit hours, 30 of which must be earned from the University of Wyoming. Credit by examination does not count towards the required 30 hours of residency credit.
4. Not more than 24 semester hours of correspondence study courses may be used toward fulfilling requirements for a bachelor's degree.
5. Not more than 4 semester hours of credit in physical activity courses can count toward a bachelor's degree.
6. The last credit applicable to degree requirements must be earned from the University of Wyoming with the following exception: students of senior standing may complete degree requirements elsewhere by obtaining special permission of the department head, adviser, and college dean, and declaring an anticipated graduation date with the Office of the Registrar.
7. Native language credit: students are not allowed university credit for language courses below the 4000-level in their native language.

## Assessment Requirement

Students may be required to complete assessment activities as determined by the university prior to the awarding of degrees.

## Second Bachelor's Degree

Students seeking a second bachelor's degree must meet all of the university and college requirements as prescribed for a first bachelor's degree. Students whose first degree was received from an institution where English is not the predominant language must complete the University Studies Writing I (WA) and II (WB) requirements. The second bachelor's degree may have the same title as the first degree and may be in the same college as the first degree; but if in the same college it must be in a different major. Grades earned in all undergraduate course work (including courses applied towards a previous UW bachelor's degree) are included in the calculation of the cumulative GPA.

The minimum study requirement for a second bachelor's degree is 30 additional semester hours earned from the University of Wyoming, 12 of which must be in upper division (junior/senior-level) or graduate-level courses. However, a student must also fulfill all of the college and major requirements for the second degree. Credit by examination does not count toward UW residency. The 30 hours is in addition to the study requirement for the first degree for those students earning the first degree from the University of Wyoming. The 30 additional hours would be added to the degree requiring the least number of hours. Both degrees may be awarded at the same commencement.

Courses applied towards one completed degree may be repeated as part of a second degree; however, the grade and GPA in the original degree will not be changed.

Students with a bachelors degree from an accredited U.S. institution will be considered to have met the UW University Studies (USP) program requirements, with the exception of the US and Wyoming Constitution requirement, unless previously completed.

## Second Bachelor's Degree Transfer Policy

Policy for University Catalog for loading transfer work for second bachelor's degree students

Typically, undergraduate coursework from other collegiate institutions will not be loaded into the University of Wyoming student database after a bachelor's degree has been earned for the student. In situations in which a student who has previously earned one bachelor's

degree from the University of Wyoming is subsequently required to take coursework from another collegiate institution to fulfill major and overall hour requirements for a second degree from the university, the student's department can ask the Office of the Registrar to load selected courses into the student's record. As with all students who wish to earn two bachelor's degrees from the university, the student will be required to successfully complete the following requirements:

- Major requirements for the major of the second degree
- College requirements for the college which will award the second degree
- A minimum of 30 additional semester hours over the minimum required for the student's first degree
- At least 60 earned semester hours from the University of Wyoming (30 required hours for first degree, 30 additional hours required for second degree)
- At least 60 earned semester hours of upper division (3000+- or junior/senior- level) credit (48 required upper division hours for first degree, 12 additional upper division hours required for second degree)
- At least 42 earned semester hours of upper division (3000+- or junior/senior- level) credit from the University of Wyoming (30 required upper division hours from UW for first degree, 12 additional upper division hours from UW required for second degree)

### Concurrent Majors

Students may pursue a concurrent major in one or more colleges. Only one degree (BA, BS, etc.) will be awarded from the college of the primary major. All university curricular requirements, including the University Studies Program requirements must be met only once. Requirements for secondary major(s) will be established by the academic departments and may include college requirements, in addition to all major requirements. An academic adviser in each major is required and each adviser must review requirements. The degree will be granted on one date only and only one diploma will be awarded. Both majors will be indicated on the academic transcript and diploma.

### Dual Degrees

It is possible to pursue degrees in one or more colleges. The university requirements and University Studies Program requirements must be met only once. Students must meet the all college and major requirements of both majors. Students must complete an additional 30 semester hours from the University of Wyoming, 12 of which must be in upper-division (junior/senior-level) or graduate-level courses beyond the credit hour requirement for the degree with the minimum number of credit hours required. An academic adviser in each major is required and each adviser must review requirements. Multiple degrees and multiple diplomas will be awarded; however, the completion date must be the same. Both colleges, degrees, and majors will be indicated on the academic transcript.

### Degree Evaluation/Declaring a Graduation Date

The degree evaluation shows requirements of the degree program and the progress that the student is making toward meeting those requirements. Any discrepancies should be reported to a degree analyst in the Office of the Registrar as soon as possible. **Students are responsible for notifying their degree analyst of their anticipated date of graduation.** Students are encouraged to submit the Anticipated Graduation Date form as early as possible in the expected term of graduation. Delaying this action could affect graduation, as requirements indicated on the degree evaluation must be met prior to a student being cleared for graduation. Students may review their degree evaluation on WyoRecords.

### Graduation Fee

Payment of the graduation fee of \$25.00 for each degree to be earned is due from all graduates at least three weeks before graduation. A late fee of \$5.00 is added if the graduation fee is paid less than three weeks before graduation. Students in certificate programs are charged a \$12.50 graduation fee for each certificate.

### Grades

Final grades covering completion of course work in correspondence study, outreach courses, transfer, special examinations, and incomplete work from previous attendance must be in the Office of the Registrar prior to when final grades are due for the term in which the degree is to be conferred.

### Final Approval

Final recommendation of the faculty and approval of the University Trustees for conferral of degrees is required. The trustees may, for good cause, decline to confer a degree upon any candidate.

### Participation in Commencement Exercises

The official graduation dates for the 2015-16 academic year are August 14, 2015, December 11, 2015, and May 14, 2016. To be eligible for a graduation date, all work must be completed prior to that date.

All academic colleges hold commencement exercises on the May graduation date. Several of the colleges also have commencement exercises in December. Check the appropriate college dean's office for specific information. Seniors are considered candidates for graduation. Students in certificate programs do not participate in Commencement. **Participation in the exercise does not automatically confer degrees. Confirmation of graduation will occur after a review of final course work.**

Commencement exercises are a historical academic custom involving participation by all segments of the university and attendance by members of the graduate's families and friends as well as the general public. Those students who participate in commencement exercises are expected to wear appropriate traditional academic regalia.

## **Graduation with Honors**

Designations of summa cum laude, magna cum laude, and cum laude will be added to the baccalaureate academic transcripts and diplomas of graduating undergraduate students earning at least 48 credit hours from the University of Wyoming (of which 45 hours must be for A-F grades) based on the following percentages:

- Top 1%     summa cum laude
- Next 4%    magna cum laude
- Next 5%    cum laude

as computed from the GPAs of graduating undergraduate students in each college. Honors graduates will be identified by comparison to a 5-year rolling grade point distribution computed for each college, to be recomputed annually each spring semester.

These designations are effective with the fall 2000 semester and are not retroactive.

Honor graduation will be granted for students in the College of Law upon successful completion of 56 hours in the college with a cumulative GPA of 3.4 or better based on University of Wyoming College of Law courses.

A Doctor of Pharmacy is awarded with honor by the university to a student who graduates with scholarship in pharmacy of unusual excellence as defined by the School of Pharmacy.

# The University Studies Program 2015

Students who enter the University of Wyoming or a Wyoming community college beginning in fall 2015 will be required to meet the USP 2015 requirements for graduation. Requirements of the USP are divided into categories based on the student learning outcomes. All courses are mutually exclusive of each other; no single course may count in more than one category. USP designated courses are open to all UW students (with a few exceptions for the Synergy and Honors Programs).

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## **Knowledge of Human Culture, the Physical & Natural World, and the U.S. & Wyoming Constitutions** **Credits**

### **Human Culture (H)** **6**

Students will understand human behaviors, activities, ideas, and values in different situations and contexts. Complete six approved credit hours of coursework. **Approved coursework does not include courses taken within the student's major department.**

### **Physical and Natural World (PN)** **6**

Students will understand the fundamental concepts of scientific and quantitative inquiry and develop the ability to understand the relevance of scientific, technological, and quantitative skills to contemporary society. Complete six approved credit hours of course work.

**Approved coursework does not include courses taken from the student's major department.**

### **U.S. & Wyoming Constitutions (V)** **3**

Students will demonstrate an understanding of the U.S. and Wyoming constitutions in order to develop the combination of knowledge, values, and motivation to participate in and improve the life of our local and global communities. Approved V courses fulfill both the U.S. and Wyoming Constitution requirements.

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## **Intellectual and Practical Skills** **Credits**

### **Communication 1 (C1)** **3**

Students will develop skills in written, oral, and digital communication as appropriate to specific disciplines and courses at the introductory, intermediate, and advanced level. Through repeated instruction, practice, and feedback, the communication sequence will emphasize and progressively develop transferable skills for students' academic work and future professions. The introductory course (C1) will emphasize foundational skills for academic writing. **Communication 1 must be completed with a C or better.**

### **Communication 2 (C2)** **3**

Intermediate courses (C2) will emphasize foundational oral and digital communication skills and continue to build on writing skills.

Successful completion of C1 is required prior to enrolling in a C2 course. This category can be fulfilled by courses taken from the student's major department. **Communication 2 must be completed with a C or better.**

### **Communication 3 (C3)** **3**

Advanced courses (C3) will emphasize using the discourse of a discipline or interdisciplinary field to communicate to academic or professional audiences through written, oral, and digital communication. Successful completion of C2 is required prior to enrolling in a C3 course. This category can be fulfilled by courses taken from the students' major department.

### **First-Year Seminar (FY)** **3**

Students will critically examine and evaluate evidence, claims, beliefs, or points of view about meaningful, relevant issues. Students will be introduced to active learning, inquiry of pressing issues, and individual and collaborative processing of ideas through the First-Year Seminar curriculum. These skills will be reinforced throughout the baccalaureate experience. The First-Year Seminar will provide the skills and philosophy necessary for success as a student and life-long learner. Students will have an opportunity to select from a wide range of academic courses covering unique and interesting subject matter focused on developing critical thinking, communication, and information literacy skills. Colleges, departments, and programs cannot require a particular FY class for a major. **First-Year Seminar must be completed with a C or better.**

### **Quantitative Reasoning (Q)** **3**

Students will reason and solve quantitative problems from a wide array of authentic contexts and everyday life situations. All students must fulfill the Q requirement, either by placing out of the course or through successfully completing the Q course.

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## **Personal & Social Responsibility** **Credits**

No mandatory USP courses. Students will have varied experiences depending on coursework and co-curricular activities chosen by them.

Wyoming Community colleges have defined a Common General Education Core Curriculum as a component of an associate's degree. Per the articulation agreement, an AA or AS or AB degree from a Wyoming community college will satisfy the lower-division requirements of the University Studies Program. Students transferring to UW from any Wyoming community college without an associate's degree will have their transcript reviewed on a course-by-course basis.

Students who enrolled at the University of Wyoming or a Wyoming community college prior to the fall of 2015 and who maintained continuous enrollment have the option of satisfying USP 2003 or USP 2015 requirements.

The following courses were approved for the University Studies Program 2015 at the time this catalog went to press. The process of course approval is ongoing. For a complete and updated list of approved courses, see the USP web site at [www.uwo.edu/unst/usp2015/](http://www.uwo.edu/unst/usp2015/).

		<b>Communication 1 (C1)</b>	ART	4790	Art History Seminar
ENGL	1010	College Composition and Rhetoric	BOT	4100	Scientific Communication
ESL	1210	English Composition for International Students	CHE	4080	Process Design II
HP	1020	Freshman Colloquium I	CHEM	4010	Communication in Chemistry
		<b>Communication 2 (C2)</b>	COJO	3010	Business and Professional Communication
AAST	2240	Introduction to African Studies	COJO	3190	Cross Cultural Communication
AAST	2360	African American History, 1619-Present	COJO	4110	Feature Writing Seminar
AGEC	3020	Practice Makes Perfect: Applying Principles of Economics to Current Agricultural and Agribusiness Problems	COJO	4160	African Rhetoric
ANTH	2000	Introduction to Linguistic Anthropology	COJO	4233	Race, Ethnicity, Gender and Media
ARBC	3060	Communicating in Arabic	COJO	4260	Rhetoric and Social Justice
ART	3710	Gender and Humanities	ECON	4240	History of Economic Thought
CHIN	3055	Business Chinese I	EDSE	4271	Subject Matter Specific Methods II: Secondary Mathematics Education
COJO	2010	Public Speaking	EDSE	4272	Subject Matter Specific Methods II: Art Education K-12
ECON	2400	Economics of the Environment	EDSE	4273	Subject Matter Specific Methods II: Secondary Social Studies Education
EDST	3000	Teacher as Practitioner	EDSE	4275	Subject Matter Specific Methods II: Secondary Science Education
ENGL	2005	Technical Writing in the Sciences	EDSE	4276	Subject Matter Specific Methods II: Secondary Modern Language Education
ENGL	2020	Introduction to Literature	EDSE	4277	Subject Matter Specific Methods II: Secondary Pedagogy Technical Education
ENGL	2035	Writing for Public Forums	ENGL	4010	Technical Writing in the Professions
ENR	2000	Environment and Society	ENGL	4025	Writing for the Web
ESL	3050	Advanced Academic Writing for International Students	ENGL	4075	Writing for Non-Profits
FCSC	2170	Clothing and Modern Society	ENGL	4990	Senior Seminar
FCSC	2200	Professionalism and Communication in Family and Consumer Sciences	ESE	4060	Systems Design I
FREN	3050	Third Year French I	ESL	4010	Technical Writing for International Students
GEOG	2200	Communication Earth Science	FCSC	4182	Textile Industry and the Environment
GERM	3050	Third Year German I	FREN	4200	Introduction to Research
HIST	2360	African American History, 1619-Present	GEOG	3280	Spatial Methods
HP	2020	Freshman Colloquium II	GEOG	4820	Capstone
INST	2240	Introduction to African Studies	HIST	4030	Senior Capstone Seminar
INST	2250	Introduction to Latin American Studies	INST	4110	International Development
INST	2280	Introduction to European Studies	INST	4950	Capstone
KIN	3012	Teaching Laboratory I	ME	4060	Systems Design I
POLS	2200	Politics of Europe	MGT	4470	Negotiations and Conflict Resolution
POLS	3680	Introduction to Empirical Political Analysis	MICR	4321	Microbiology Capstone
RELI	2200	Contemporary American Religion	MKT	4450	Advanced Marketing Management
RELI	2320	History of Islam	MLSK	4860	Laboratory Management
RELI	2450	Traditional African Religions	MOLB	4320	Investigations in Molecular Biology
RELI	3245	Christianity Since Darwin	MUSC	4265	Elementary and Secondary Music Methods
REWM	4530/4830	Ecological Applications and Seminar	MUSC	4330	Baroque Period
RUSS	3050	Third Year Russian I	MUSC	4340	Romantic Period
SPAN	3050	Third Year Spanish I	NURS	4055	Evidence-Based Nursing for the RN
WMST	2500	Gender and Society	PHCY	6102	Biopharmaceutics and Pharmacokinetics
WMST	3710	Gender and Humanities	PHCY	6241	Organizational and Societal Issues Within the Health Care System
		<b>Communication 3 (C3)</b>	PHCY	6245	Patient/Professional Interactions
AAST	4160	African Rhetoric	PHCY	6250	Drug Literature Evaluation
AAST	4233	Race, Ethnicity, Gender and Media	PHCY	6270	Intermediate Pharmacy Practicum
AAST	4260	Rhetoric and Social Justice	PHCY	6370	Advanced Pharmacy Experience Orientation
ACCT	4600	Accounting Ethics and Professionalism	PHCY	6471	Internal Medicine II
AECL	4990	Agroecology Seminar	PHCY	6473	Ambulatory Pharmaceutical Care
AGEC	4965	Agribusiness Entrepreneurial Management and Communication	PHYS	3650	Advanced Modern Physics Lab
AGEC	4670	Technical Communication for Agribusiness Majors	POLS	4810	Seminar in Political Philosophy
ANSC	4630	Topics and Issues in Animal Science	POLS	4840	Seminar in Public Law
ANTH	3300	Ethnographic Methods	POLS	4850	Seminar in American Political Institutions
ART	4010	Contemporary Art: Theory and Practice	POLS	4870	Seminar in International Relations: Comparative Genocide
ART	4600	Professional Practices and Strategies	RELI	4000	Theories in Religion
			REWM	4900	Rangeland Management and Planning
			RUSS	4200	Senior Seminar: Russian Culture
			SOC	4090	Sociological Research Methods

SOC	4110	International Development	UWYO	1101	Ingredients for Academic and Career Success
SOWK	4570	Social Work Research Methods	UWYO	1101	Your Loyal Correspondent: Journals, Letters, and Diaries in Peace and Conflict
SPAN	4200	Introduction to Research			Spiritual Intelligence
SPPA	4750	Research Methods in Communication Disorders	UWYO	1101	The Challenge of Sustainability: Project-Based Learning
THEA	4200	20th Century Dance	UWYO	1101	Synergy: Investing Worlds of Work
THEA	4930	Theatre History I	UWYO	1101	Ignite Your Passion: Creating Change Through Service and Action
WMST	4233	Race, Ethnicity, Gender and Media	UWYO	1101	Investing in the Future You: Financial Literacy from College to Career
ZOO	4100	Scientific Communication	UWYO	1101	Outdoor Leadership
		<b>First-Year Seminar (FY)</b>			Keep Your Money, We Want Change: Leadership for a Better World
AAST	1101	African American in the Equality State	UWYO	1101	Synergy: Sections 1-18
AGEC	1101	Public (mis)perceptions of agriculture			Sex and the International City
AMST	1101	Cultures of College	UWYO	1101	I heard it through the grapevine
ANTH	1101	Anthropology of Monsters	UWYO	1101	
ART	1101	Reading Tex(tiles): Exploring Fabric as a Vehicle for Communication	UWYO	1101	
BUSN	1101	Decision Making in Business	WMST	1101	
CHST	1101	Latina/o Popular Culture: Art, Theare, Media, Music and Sports	ZOO	1101	
CNSL	1101	E.P.I.C. Leadership	AAST	3000	<b>Human Culture (H)</b>
COJO	1101	Small Group Communication	AGEC	4600	African American Music
COJO	1101	Trending Now: Media Literacy in the 21st Century	AMST	2010	Community Economic Analysis
COSC	1101	The Beauty and Joy of Computing	AMST	2110	Introduction to American Studies
EDEC	1101	The Power of Play	AMST	2110	Cultural Diversity in America
EDSE	1101	Superheroes, Stan Lee, and Studying for Success: What does popular culture have to do with research?	ANTH	1200	Introduction to Cultural Anthropology
EDST	1101	Fight the Power: Diversity and Social Justice	ANTH	1450	World Archaeology
EDST	1101	The Citizen Factory: Schooling and Democracy in the US	ANTH	3400	Hunters & Gatherers
ENGL	1101	Night of the Living Film: Zombies, Living Dead, Walkers... Humans	ART	2010	Art History Survey I
ENR	1101	Thinking Like a Mountain: Environmental Problems, Interdisciplinary Solutions	ART	2020	Art History Survey II
ERS	1101	Energy and Society	CHIN	1010	First Year Chinese I
ES	1101	Introduction to Engineering Study	CHIN	1020	First Year Chinese II
FCSC	1101	People, Place, Profit and Policy: Sustainability and Well-Being in the Built Environment	CHIN	3160	See Movies, Touch China
FCSC	1101	Building Connections Between Human and Environmental Health	CHST	1300	Intro to Latina/o Studies
FDSC	1101	Feeding the Planet: Mankind's Greatest Challenge	CLAS	2020	Classical Greek Civilization
GEOG	1101	Water Planet	COJO	1000	Introduction to Mass Media
HLSC	1101	Aging in America	COJO	1030	Interpersonal Communication
INST	1101	Society and the Outsider	ECON	1000	Global Economic Issues
ITEC	1101	Are you naked online? Taking control of your digital image	ECON	1010	Principles of Macro Economics
KIN	1101	Kinesiology - the Science of Human Movement	ECON	1020	Principles of Micro Economics
KIN	1101	Contemporary Issues in North American Sport	EDEL	2280	Literature for Children
MOLB	1101	The Neanderthal and the nucleus; the molecular biology of being human	EDST	2450	Foundations for Development and Learning
NURS	1101	Should Health Care Fly?	EDST	2480	Diversity and the Publics of Schooling
PATB	1101	One Health: People, Animals, and the Environment - Zero Degree of Separation	ENGL	2410	Literary Genres
PHCY	1101	Navigating Survival: A Compass for Campus Mental Health	ENR	3000	Approaches to the ENR Problem Solving
PHYS	1101	What really happened: How scientific theories come about	FCSC	1180	Applied Design
PHYS	1101	Creationism vs. Evolution	FCSC	3220	Multicultural Influences on Children and Families
PLNT	1101	Eating as an Agricultural Act	FREN	1010	First Year French I
POLS	1101	Dangerous Ideas: First Amendment Civil Liberties in Theory and Practice	FREN	1020	First Year French II
RELI	1101	Worlds of Religion	FREN	2030	Second Year French I
RELI	1101	Gilgamesh to the Bomb	FREN	2040	Second Year French II
SPAN	1101	Keep Calm and Don't Eat That!	FREN	2130	Contemporary French Culture
STAT	1101	The Power of Confidence	GEOG	1000	World Regionally Geography
THEA	1101	Theatre as Manifesto	GEOG	1020	Human Geography
			GERM	1010	First Year German I
			GERM	1020	First Year German II
			GERM	2030	Second Year German I
			GERM	2040	Second Year German II
			HIST	1320	World History to 1750
			HIST	4340	Social History of American Women
			HIST	4405	American Encounters to 1850
			HIST	4406	American Encounters from 1850
			HIST	4410	American in an Early Modern World
			HIST	4415	Entangled Worlds, Entangled Lives: Indigenous People and Colonizers before 1850
			HP	1151	Colloquium I
			HP	2151	Japanese Modern Culture and Society



HP	2153	Bali: Life and Art		
JAPN	1010	First Year Japanese I	AECL	1000
JAPN	1020	First Year Japanese II	ANTH	1100
LATN	1010	First Year Latin, I	ANTH	1300
LATN	1020	First Year Latin, II	ASTR	1050
MUSC	1000	Intro to Music	ASTR	1070
MUSC	1390	Jazz Ensemble I	ATSC	2000
MUSC	1400	Collegiate Chorale I	CHEM	1000
MUSC	1405	Singing Statesmen I	CHEM	1020
MUSC	1415	Bel Canto I	CHEM	1030
MUSC	1417	Civic Chorus I	CHEM	1050
MUSC	1430	Symphony Orchestra I	CHEM	1060
MUSC	3390	Jazz Ensemble II	ENR	1200
MUSC	3400	Collegiate Chorale II	ENR	1500
MUSC	3405	Singing Statesmen II	ENTO	1000
MUSC	3415	Bel Canto II	GEOG	1010
MUSC	3417	Civic Chorus II	GEOL	1100
MUSC	3430	Symphony Orchestra II	GEOL	1500
MUSC	4490	History of Rock and Roll	GEOL	3600
PHIL	1000	Introduction to Philosophy	GEOL	3650
PHIL	2345	Natural Resource Ethics		
PSYC	1000	General Psychology	LIFE	1002
RELI	1000	Introduction to Religion	LIFE	1003
RELI	2050	Religions of Asia	LIFE	1010
RELI	2315	History of Non-Western Religions	LIFE	1020
RELI	2330	Islam in the Modern World	PHYS	1050
RELI	3090	Middle East and Israel in Film	PHYS	1090
RUSS	1010	First Year Russian I	PHYS	1110
RUSS	1020	First Year Russian II	PHYS	1120
RUSS	2030	Second Year Russian I	PHYS	1210
RUSS	2040	Second Year Russian II	PHYS	1220
SOC	1000	Sociological Principles	PLNT	2025
SPAN	1010	First Year Spanish I		
SPAN	1020	First Year Spanish II	MATH	1000
SPAN	2030	Second Year Spanish I	MATH	1105
SPAN	2040	Second Year Spanish II		
THEA	1000	Introduction to Theatre	MATH	1123
THEA	1100	Beginning Acting	MATH	1400
THEA	1410	Ballet I/I	MATH	1405
THEA	1420	Ballet I/II	MATH	2200
THEA	1430	Modern Dance I/I	MATH	2205
THEA	1440	Modern Dance I/II	MATH	2350
THEA	1480	Beginning Jazz Dance	MATH	1050
THEA	2200	Backgrounds of Dance	STAT	2050
THEA	2480	Jazz II	STAT	2070
WIND	2100	Introduction to Disability Studies		
WIND	2700	Gender and Disability		
WMST	1080	Intro to Women's Studies	ECON	1200
WMST	2000	Intro to LGBTQ/NS Studies	HIST	1211
WMST	2700	Gender and Disability	HIST	1221
			HIST	1251
			POLS	1000
			POLS	1100

**Physical and Natural World (PN)**

Agroecology
Introduction to Biological Anthropology
Introduction to Archaeology
Survey of Astronomy
The Earth: Its Physical Environment
Introduction to Meteorology
Introductory Chemistry
General Chemistry I
General Chemistry II
Advanced General Chemistry I
Advanced General Chemistry II
Environment
Water, Dirt and Earth's Environment
Insect Biology
Introduction to Physical Geography
Introduction to Physical Geology
Water, Dirt and Earth's Environment
Earth and Mineral Resources
Energy for Society: Addressing the Energy Grand Challenge
Discovering Science
Current Issues in Biology
General Biology
Life Sciences
Concepts of Physics
Fundamentals of the Physical Universe
General Physics I
General Physics II
Engineering Physics I
Engineering Physics II
Horticultural Science

**Quantitative Reasoning (Q)**

Problem Solving
Data, Probability, & Algebra for Elementary School Teachers
Math, Music and Acoustics
College Algebra
Trigonometry
Calculus I
Calculus II
Business Calculus
Finite Mathematics
Fundamentals in Statistics
Introductory Statistics for the Social Sciences

**U.S. and Wyoming Constitutions (V)**

Economics, Law, and Government
US to 1865
US from 1865
History of Wyoming
American and Wyoming Government
Wyoming Government*

\* will only meet Wyoming portion of V requirement. Will be able to use this in combination with US Constitutions course (transferred)

# University Studies Designations

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Beginning Fall Semester 2015, students entering UW are required to fulfill the **University Studies Program 2015**. Students who entered UW or a Wyoming community college prior to fall 2015 may complete the previous University Studies Program (USP 2003). Students must complete all of the requirements in the program under which they are enrolled, (either USP 2003 or USP 2015). Students who are currently under the USP 2003 requirement may choose to switch to USP 2015 with a University Studies Petition; however, they will be responsible for completing all of the USP 2015 requirements. Careful selection of courses is essential, as some courses may satisfy both 2003 and 2015 USP requirements, while others do not.

The following table displays the codes for both USP 2003 and USP 2015. The major difference between codes for the two systems is the use of alphanumeric designations for the old (2003) USP system, and solely letter designations for the new (2015) USP system. The sequence A, B, C, used for Writing and Quantitative Reasoning Categories would stand for Introductory, Lower Division, and Upper Division.

USP codes are listed in course descriptions in brackets with the 2003 USP code followed by the 2015 USP code, ( e.g. [QB♦Q]).

<b>Area</b>	<b>USP 2003 Codes</b>	<b>USP 2015 Codes</b>
Integrated Cultural Context	C	-
Humanities	CH	H
Social Sciences	CS	H
Arts	CA	H
Diversity in the United States	D	-
Global Awareness	G	-
Intellectual Community	I	-
First-Year Seminar	-	FY
Information Literacy	L	-
Oral Communication	O	-
Physical Activity and Health	P	-
Quantitative Reasoning I	QA	Q
Quantitative Reasoning II	QB	Q
Quantitative Reasoning III	-	Q
Integrated Science	S	-
Biological Science	SB	PN
Physical Science	SP	PN
Earth Science	SE	PN
US and Wyoming Constitutions	V	V
Writing I	WA	C1
Writing II	WB	C2
Writing III	WC	C3

# The University Studies Program 2003

Students first entering UW in the Fall 2003 semester or later must satisfy the USP 2003 requirements. USP codes are listed in course descriptions in brackets with the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

An education at the University of Wyoming is grounded in a broad understanding of human knowledge developed through a range of courses and co-curricular activities, the most important of which is the University Studies Program of general education, required of all UW students. The specialized knowledge of a major evolves from general education. These two components of an education are complementary, enhancing one another throughout a student's career.

The goal of the University Studies Program is to provide a general education that will help students develop for full participation in a technologically intricate world including:

1. The ability to express oneself in speech and writing;
2. The ability to locate, evaluate, and use information;
3. The ability to examine problems from quantitative, qualitative, and scientific perspectives;
4. Encouragement to become active citizens in a diverse society;
5. Gaining perspective to appreciate the viewpoints and deal with complex issues of others through multi- and inter-disciplinary inquiry;
6. Understanding the responsibility to participate in a democratic society;
7. Communicating clearly in a civic environment.

## Requirements of the University Studies Program 2003 are:

Area	# of courses	Hours
<b>Core Components:</b>		
Core Components are mutually exclusive; meaning, two core components may not be fulfilled by the same course. Except for the QA, core courses may have topics from the embeddable components list included in their curriculum		
<b>Intellectual Community</b>	1	1-3
I - Offered in academic departments. May be taken for 1-3 credit hours		
<b>Writing</b>		
WA - Students must complete a WA course with a grade of C or better	1	3
<b>Oral Communications</b>		
O - One approved course emphasizing oral communication skills	1	3
<b>Quantitative Reasoning</b>		
QA - Quantitative Reasoning I	1	3
QB - Quantitative Reasoning II	1	3
<b>Science</b>	1-2	4-8

Complete two approved courses from any of the following categories. At least one of the courses must have a laboratory component.

- SB - Biological Sciences
- SP - Physical Sciences
- SE - Earth Sciences
- or

Area	# of courses	Hours
Complete one approved <b>Integrated Science (S)</b> course, which must have a laboratory component.		
<b>Cultural Context</b>	3	9
Complete nine approved credit hours, three hours from each of the three categories.		
CH - Humanities		
CS - Social and Behavioral Sciences		
CA - Fine Arts		
Three hours of <b>Integrated Cultural Context (C)</b> may be substituted for one of the three categories.		
<b>U.S. &amp; Wyoming Constitution</b>	1	1
V - Approved V courses fulfill both US and Wyoming Constitution requirements		
<b>Physical Activity &amp; Health</b>	1	1
P - Complete an approved P course.		
<b>Embeddable Components</b>		
Embeddable Components are those that may be in a course dedicated solely to that topic, or embedded in courses dedicated to the core components of University Studies, or embedded in courses required for the major. Embeddable Components will ordinarily be fulfilled in the context of three-credit hour courses.		
<b>Information Literacy</b>	1	
L - One approved course		
<b>Diversity in the U.S.</b>	1	
D - One approved course		
<b>Global Awareness</b>	1	
G - One approved course		
<b>Writing 2</b>		
WB - One mid-level writing or writing-intensive course (2000-4999 level)	1	
<b>Writing 3</b>		
WC - One upper-division writing or writing-intensive course (3000-4999 level)	1	
<b>Total:</b>		<b>30-36</b>
Wyoming Community Colleges have defined a Common General Education Core Curriculum as a component of an associate's degree. Per the articulation agreement, an AA or AS degree from a Wyoming community college plus three additional credits of mathematics will satisfy the lower-division requirements of the University Studies Program. Students transferring to UW from any Wyoming community college without an associate's degree will have their transcript reviewed on a course by course basis. See page 32 for specific information regarding the Wyoming Community College Articulation Agreement.		
Students who enrolled at the University of Wyoming prior to the fall of 2015 and who maintained continuous enrollment have the option of satisfying USP 2003 or USP 2015 requirements. Wyoming community college students who transfer to UW will have the option of meeting either the USP 2003 requirements or the USP 2015 requirements.		

The following courses were approved for the University Studies Program 2003 at the time this catalog went to press. The process of course approval is ongoing. For a complete and updated list of approved courses, see the USP web site at [www.uwyo.edu/unst/usp-2003/](http://www.uwyo.edu/unst/usp-2003/).

#### Cultural Context - Integrated (C)

AAST	4546	Agriculture: Rooted in Diversity
AGRI	4546	Agriculture: Rooted in Diversity
AIST	4546	Agriculture: Rooted in Diversity
AMST	3100	Food in American Culture
AMST	4546	Agriculture: Rooted in Diversity
CHST	4546	Agriculture: Rooted in Diversity
CLAS	2020	Classical Greek Civilization
COJO	2110	Nonverbal Communication
ENGL	4546	Agriculture: Rooted in Diversity
FCSC	4546	Agriculture: Rooted in Diversity
HIST	4546	Agriculture: Rooted in Diversity
WMST	2000	Intro to GLBTQ/NS Studies

#### Cultural Context - Arts (CA)

AAST	2730	African Creativity and Ritual
ANTH	2730	African Creativity and Ritual
ART	1005	Drawing I
ART	2010	Art History Survey I
ART	2020	Art History II: Renaissance through Modern Art
ART	2730	African Creativity and Ritual
ART	4830	Victorian Women's Lives: Their Art, Literature and Culture
CHST	4100	US Latina/o Theatre
COJO	2400	Introduction to Photography
COJO	3200	Graphics of Communication
EDEL	3170	Meaning in Art
ENGL	4830	Victorian Women's Lives: Their Art, Literature and Culture
FCSC	1180	Applied Design
KIN	2004	Movement Core V: Creative Movement and Dance in Physical Education
MUSC	1000	Introduction to Music
MUSC	1380	Wind Ensemble
MUSC	1400	Collegiate Chorale
MUSC	1430	University Orchestra
MUSC	2050	Historical Survey I
MUSC	3480	String Ensemble: Chamber Music
MUSC	4315	America's Ethnic Music
THEA	1000	Intro to Theater
THEA	1100	Beginning Acting
THEA	1410	Ballet I/I
THEA	1420	Ballet I/II
THEA	1430	Modern Dance I/I
THEA	1440	Modern Dance I/II
THEA	2200	Backgrounds of Dance
THEA	4200	20th Century Dance
WMST	4100	US Latina/o Theatre
WMST	4830	Victorian Women's Lives: Their Art, Literature and Culture

#### Cultural Context - Humanities (CH)

AAST	2450	African Traditional Religions
AAST	3260	African Spirits in the New World
AAST	4000	Quest for Civil Rights: Martin Luther King, Malcolm X and the Civil Rights Era
AAST	4020	The Black West
AAST	4160	African American Rhetoric
AIST	2290	History of North American Indians
AIST	2340	Native American Culture and Literature
AIST	2345	American Indians in Hollywood Film
AMST	2010	Introduction to American Studies
AMST	2700	Introduction to Museology
AMST	3400	Popular Music and Sexualities
ANTH	2700	Introduction to Museology
ARE	3030	History of Architecture
ART	2700	Introduction to Museology
ART	3710	Gender and Humanities
ART	4610	Studies in Art
CHST	2360	Mexican American Literature
CHST	4470	Mexican American Literature
CLAS	2040	Classical Roman Civilization
COJO	4160	African American Rhetoric
EDEL	2275	Literature for Young Children
EDEL	2280	Literature for Children
ENGL	1080	Introduction to Women's Studies
ENGL	2020	Introduction to Literature
ENGL	2340	Native American Culture and Literature
ENGL	2345	American Indians in Hollywood Film
ENGL	2360	Mexican American Literature
ENGL	2410	Literary Genres
ENGL	2425	Literatures in English I
ENGL	2430	Literatures in English II
ENGL	2435	Literatures in English III, 1865- present
ENGL	3150	World Literature
ENGL	3710	Gender and Humanities
ENGL	4470	Mexican American Literature
FREN	2140	Introduction to Reading
GERM	2140	Introduction to Literature
GERM	3006	20TH Century German Culture and Civilization
GERM	3150	German History and Culture
HIST	1110	Western Civilization I
HIST	2080	The Holocaust
HIST	2250	American Religious History I (to 1865)
HIST	2252	American Religious History II (1865-1945)
HIST	2290	History of North American Indians
HIST	2315	History of non-Western Religions
HIST	2320	History of Islam
HIST	2700	Introduction to Museology
HIST	3275	World Christianities
HIST	3710	Gender and Humanities
HP	1151	Freshman Honors Colloquium I
HP	1161	Freshman Honors Colloquium II
KIN	1040	Contemporary Topics in North American Sport
PHIL	1000	Introduction to Philosophy

PHIL	2100	The Greek Mind	ECON	1400	Topics in Economics: Sports Economics
PHIL	2300	Ethics in Practice	EDST	2450	Human Lifespan Development
PHIL	2310	Philosophy of Religion	ENR	4000	Approaches to Environment and Natural Resource Problem-Solving
PHIL	2330	Environmental Ethics			
PHIL	2345	Natural Resource Ethics	ENR	4890	Topics in Environment and Natural Resources
PHIL	2420	Critical Thinking	FCSC	2121	Child Development
PHYS	4690	Science Fact, Fiction and Future	FCSC	3220	Multicultural Influences on the Young Child
RELI	1000	Introduction to Religion	FCSC	4117	Understanding Community Leadership
RELI	2040	Religions of the Middle East	GEOG	1000	World Regional Geography
RELI	2050	Religions of Asia	GEOG	1020	Introduction to Human Geography
RELI	2080	The Holocaust	GEOG	2370	Chicano History: Origins to 1900
RELI	2110	Introduction to the Old Testament	GEOG	3030	Geography and Development
RELI	2200	Contemporary American Religion	GEOG	3400	Traditional Ecological Knowledge
RELI	2250	American Religious History I (to 1865)	GEOG	3550	Natural Hazards and Society
RELI	2252	American Religious History II (1865-1945)	GEOG	4040	Conservation of Natural Resources
RELI	2315	History of non-Western Religions	HIST	1320	World History to 1750
RELI	2320	History of Islam	HIST	1330	World History from 1750
RELI	2410	Varieties of Non-Belief in the Western World	HIST	2040	Imperial China
RELI	2450	African Traditional Religions	HIST	2370	Chicano History: Origins to 1900
RELI	3260	African Spirits in the New World	HIST	4410	America in an Early Modern World
RELI	3275	World Christianities	HIST	4492	Indian Cultures of Latin America, 15th Century - Present
RELI	3400	Religion in the American West			
RELI	4160	Moses, Jesus, and Muhammad	INST	1060	World Regional Geography
RNEW	2345	Natural Resource Ethics	INST	1200	Non-Western Political Cultures
RUSS	2140	Introduction to Reading	INST	1330	World History from 1750
RUSS	3205	Russian Folklore and Folk Life	INST	2350	How the World Really Works
SPAN	2140	Introduction to Literature	INST	4155	Women, War and Health
WIND	2100	Introduction to Disability Studies	INST	4175	Gender, Women and Health
WMST	1080	Introduction to Women's Studies	INST	4680	Shanghai: Past & Present
WMST	3400	Popular Music and Sexualities	NURS	4155	Women, War and Health
WMST	3650	Contemporary U.S. Immigrant Women Writers	NURS	4175	Gender, Women and Health
WMST	3710	Gender and Humanities	NURS	4960	Women's Bodies/Women's Minds
WMST	4520	Gender and Sexuality in Postcolonial Writing	POLS	1200	Non-Western Political Cultures
<b>Cultural Context - Social Sciences (CS)</b>					
AAST	3670	African Diaspora	POLS	2000	Current Issues in American Politics
AAST	4231	Minority Media Ownership	POLS	2430	Parties, Interest Groups & Elections
AGEC	1010	Principles of Macroeconomics	PSYC	1000	General Psychology
AGEC	1020	Principles of Microeconomics	SOC	1000	Sociological Principles
AIR	3020	Air Force Leadership II	SOC	1350	American Indians in Contemporary Society
AIST	1001	Foundations in American Indian Studies	SOC	4680	Shanghai: Past & Present
AIST	1350	American Indians in Contemporary Society	SPPA	4070	Deaf Culture and the History of Deaf America
AIST	2210	North American Indians	WIND	4020	Disability: Supports and Services
AIST	3400	Traditional Ecological Knowledge	WMST	3800	Chicanas/os in Contemporary Society
AIST	4492	Indian Cultures of Latin America, 15th Century - Present	WMST	4155	Women, War and Health
AMST	2110	Cultural Diversity in America	WMST	4175	Gender, Women and Health
ANTH	1200	Introduction to Cultural Anthropology	WMST	4580	Gender, Global Change, and Development
ANTH	1300	Introduction to Archaeology	WMST	4960	Women's Bodies/Women's Minds
ANTH	1450	World Archaeology	<b>Diversity in the US (D)</b>		
ANTH	2200	Understanding Cultures	AAST	1000	Introduction to African American Studies
ANTH	2210	North American Indians	AAST	1030	Social Justice in the 21st Century
CHST	1100	Introduction to Chicano Studies	AAST	2350	Introduction to African American Literature
CHST	2370	Chicano History: Origins to 1900	AAST	4000	Black Freedom Movement
CHST	3800	Chicanas/os in Contemporary Society	AAST	4020	The Black West
CNSL	2200	Introduction to Student Leadership	AAST	4100	African American Religious Culture
COJO	1000	Introduction to Mass Media	AAST	4160	African American Rhetoric
COJO	1040	Introduction to Human Communication	AAST	4231	Minority Media Ownership
COJO	4231	Minority Media Ownership	AAST	4233	Race, Ethnicity, Gender in Media
COJO	4232	Media Convergence	AAST	4250	The Harlem Renaissance
CNSL	2200	Introduction to Student Leadership	AAST	4455	Literature of Enslavement
ECON	1000	Global Economic Issues	AAST	4546	Agriculture: Rooted in Diversity
ECON	1010	Principles of Macroeconomics	AAST	4675	US Women of Color
ECON	1020	Principles of Microeconomics	AAST	4985	Rhetoric and Social Justice
ECON	1300	Oil: Business, Culture, and Power	AGRI	4546	Agriculture: Rooted in Diversity
			AIST	1001	Foundations in American Indian Studies
			AIST	1350	American Indians in Contemporary Society

AIST	2210	North American Indians	NURS	3020	Cultural Diversity in Family Health Care
AIST	2290	History of North American Indians	PHIL	2345	Natural Resource Ethics
AIST	2340	Native American Culture and Literature	RELI	2200	Contemporary American Religion
AIST	2345	American Indians in Hollywood Films	RELI	2250	American Religious History I (to 1865)
AIST	3000	Plains Culture and History	RELI	2252	American Religious History II (1865-1945)
AIST	3100	Tribal Literature of the Great Plains	RELI	3400	Religion in the American West
AIST	3400	Traditional Ecological Knowledge	RELI	4100	African American Religious Culture
AIST	4000	Indians of Wyoming	REWM	4051	Environmental Politics
AIST	4110	Educational Foundations in American Indian Education	RNEW	2345	Natural Resource Ethics
AIST	4546	Agriculture: Rooted in Diversity	SOC	1350	American Indians in Contemporary Society
AMST	1030	Social Justice in the 21st Century	SOC	2350	Race and Ethnic Relations
AMST	2110	Cultural Diversity in America	SOWK	4060	Diversity and Difference in Social Work
AMST	3400	Popular Music and Sexualities	SPPA	4070	Deaf Studies
AMST	4250	The Harlem Renaissance	WIND	2100	Introduction to Disability Services
AMST	4546	Agriculture: Rooted in Diversity	WIND	2700	Gender and Disabilities
ANTH	2210	North American Indians	WMST	1030	Social Justice in the 21st Century
CHST	1030	Social Justice in the 21st Century	WMST	1080	Introduction to Women's Studies
CHST	1100	Introduction to Chicano Studies	WMST	2000	Intro to GLBTQ/NS Studies
CHST	2360	Mexican American Literature	WMST	2389	History of Women and the American West
CHST	2370	Chicano History: Origins to 1900	WMST	2700	Women with Disabilities
CHST	3200	Perspectives of Chicana Studies	WMST	3200	Perspectives of Chicana Studies
CHST	3800	Chicanas/os in Contemporary Society	WMST	3400	Popular Music and Sexualities
CHST	4100	US Latina/o Theatre	WMST	3650	Contemporary US Immigrant Women Writers
CHST	4470	Chicano/a Folklore	WMST	3800	Chicanas/os in Contemporary Society
CHST	4546	Agriculture: Rooted in Diversity	WMST	4100	US Latina/o Theatre
CHST	4675	US Women of Color	WMST	4233	Race, Ethnicity, Gender in Media
COJO	3190	Cross-Cultural Communication	WMST	4675	US Women of Color
COJO	4160	African American Rhetoric			
COJO	4231	Minority Media Ownership			
COJO	4985	Rhetoric and Social Justice			
EDSE	4254	Becoming a Reflective Practitioner: Specific Pedagogy in Music			
					<b>Global Awareness (G)</b>
EDST	2480	Diversity and the Politics of Schooling	AS	2200	British Life and Culture
EDST	4110	Educational Foundations in American Indian Education	AAST	2450	African Traditional Religions
ENGL	1080	Introduction to Women's Studies	AAST	2730	African Creativity and Ritual
ENGL	2340	Native American Culture and Literature	AAST	3260	African Spirits in the New World
ENGL	2345	American Indians in Hollywood Film	AAST	3670	African Diaspora
ENGL	2350	Introduction to African American Literature	AECL	1000	Agroecology
ENGL	2360	Mexican American Literature	AGEC	3860	Economics of World Food & Agriculture
ENGL	3100	Tribal Literatures of the Great Plains	AGEC	4280	International Food and Farm Cultures
ENGL	4450	African American Novel	AGEC	4880	International Agricultural Trade, Markets and Policy
ENGL	4470	Chicano/a Folklore	AIR	4010	National Security Affairs I
AAST	4455	Literature of Enslavement	AIST	4492	Indian Cultures of Latin America, 15th Century - Present
ENGL	4546	Agriculture: Rooted in Diversity	ANTH	1200	Introduction to Cultural Anthropology
FCSC	3220	Multicultural Influences on the Young Child	ANTH	1300	Introduction to Archaeology
FCSC	4546	Agriculture: Rooted in Diversity	ANTH	1450	World Archaeology
GEOG	2370	Chicano History: Origins to 1900	ANTH	2200	Understanding Cultures
GEOG	3400	Traditional Ecological Knowledge	ANTH	2730	African Creativity and Ritual
HIST	2250	American Religious History I (to 1865)	ANTH	3015	Introduction to the Music of the World's Peoples
HIST	2252	American Religious History II (1865-1945)	ARE	3030	History of Architecture
HIST	2290	History of North American Indians	ART	2730	African Creativity and Ritual
HIST	2370	Chicano History: Origins to 1900	ART	4650	International Art Studio, Turkey/India
HIST	2389	History of Women and the American West	BUSN	2000	Introduction to International Business
HIST	3000	Plains Culture and History	CHIN	3055	Business Chinese
HIST	4000	Indians of Wyoming	CRMJ	4280	Comparative Criminal Justice
HIST	4405	American Encounters: Cross Cultural Relations to 1850	ECON	1000	Global Economic Issues
HIST	4406	American Encounters from 1850	ECON	1300	Oil: Business, Culture, and Power
HIST	4546	Agriculture: Rooted in Diversity	ECON	2400	Economics of the Environment
KIN	1040	Contemporary Topics in North American Sport	ENGL	3150	World Literature
MUSC	4315	America's Ethnic Music	ENR	2000	Environment and Society
			ESS	3480	Environmental Change
			FCSC	4181	Global Textile Marketplace
			FREN	2140	Introduction to Reading
			GEOG	1000	World Regional Geography
			GEOG	1020	Introduction to Human Geography

GEOG	3030	Geography and Development	SOC	4370	Global Political Economy
GEOG	3480	Environmental Change	SOC	4680	Shanghai: Past & Present
GEOL	1600	Global Sustainability	SOWK	4881	International Studies
GEOL	3600	Earth & Mineral Resources	SPAN	2140	Introduction to Literature
GEOL	3650	Energy: A Geological Perspective	SPAN	3120	Survey of Spanish American Literature
GERM	2140	Introduction to Literature	THEA	2200	Backgrounds of Dance
GERM	3150	German History and Culture	WMST	4155	Women, War and Health
HIST	1320	World History to 1750	WMST	4175	Gender, Women and Health
HIST	1330	World History from 1750	WMST	4240	Global Sex Work and Trafficking
HIST	2040	Imperial China	WMST	4590	Women of India
HIST	2315	History of non-Western Religions	WMST	4520	Gender and Sexuality in Postcolonial Writing
HIST	2320	History of Islam	WMST	4580	Gender, Global Change, and Development
HIST	3220	History of the Modern Middle East			
HIST	3275	World Christianities			
HIST	4410	America in an Early Modern World			
HIST	4350	Global History			
HIST	4492	Indian Cultures of Latin America, 15th Century - Present			
HLSC	4100	Global Public Health	AS	1000	<b>Intellectual Community (I)</b> Intellectual Community of Undeclared Students
HLSC	4520	Public Health in Developing Countries	AS	3105	From Gilgamesh to the Bomb
INST	1060	World Regional Geography	AAST	1030	Social Justice in the 21st Century
INST	1200	Non-Western Political Cultures	ACCT	1010	Principles of Accounting I
INST	1330	World History from 1750	ADED	1000	Adult Education Inquiry
INST	2000	Introduction to International Business	ADED	1008	Eastern Thought Western Practice
INST	2230	Introduction to Asian Studies	AGEC	1000	Agriculture and Applied Economics Orientation
INST	2310	Introduction to International Relations	AGRI	1001	Intellectual Community and Information Literacy in Agriculture
INST	2350	How the World Really Works	AGRI	3000	Discovering and Utilizing Ideas and Information
INST	3000	Social Change	AIST	1030	Social Justice in the 21st Century
INST	3100	Chinese Society	AMST	1030	Social Justice in the 21st Century
INST	3400	Politics and Society of Turkey	ANSC	1000	Intellectual Community in Animal and Veterinary Sciences
INST	3860	Economics of World Food & Agriculture	ANTH	1000	Intellectual Community in Anthropology
INST	4100	Global Public Health	ART	1115	Digital Media
INST	4110	Sociology of International Development	CHEM	1001	The Chemical Community
INST	4155	Women, War, and Health	CHST	1030	Social Justice in the 21st Century
INST	4175	Gender, Women, and Health	CNSL	1000	Relationship Skills: Counseling in Action
INST	4240	Global Sex Work and Trafficking	COJO	1001	Issues in the Mass Media
INST	4250	Economic Development in Asia	COJO	1041	Issues in Human Communication
INST	4370	Global Political Economy	CRMJ	1005	Issues in Criminal Justice
INST	4680	Shanghai: Past & Present	EDAD	1000	Schools and Democracy
LANG	3140	Anime: History and Culture	EDEL	1000	Exploring Hot Topics in Education
LIFE	2002	Global Ecology	EDSE	1000	Exploring Hot Topics in Secondary Education
MOLB	4520	Public Health in Developing Countries	EDST	1500	Education for Social Justice
MUSC	3015	Introduction of the Musics of the World's Peoples	ENGL	1030	Intellectual Community in Cinema, etc.
NURS	4155	Women, War, and Health	ENGL	1040	Introduction to Creative Writing
NURS	4175	Gender, Women, and Health	ENR	1100	Environment and Natural Resource Problems and Policies
PHIL	3250	Global Justice	ENR	1400	Biodiversity: Science and Society
POLS	1200	Non-Western Political Cultures	ES	1000	Orientation to Engineering
POLS	2300	World Politics in the Post-Cold War Era	ESS	1000	Wyoming in the Earth System
POLS	2310	Introduction to International Relations	FCSC	1010	Perspectives in Family and Consumer Sciences
POLS	4890	Seminar in Comparative Politics	GEOL	1001	Intellectual Community/Earth Sciences
RELI	1000	Introduction to Religion	HIST	1010	Introduction to History: Encounters with Difference
RELI	2040	Religions of the Middle East	HLSC	1010	Exploring the Health Sciences
RELI	2050	Religions of Asia	HLSC	1020	Intellectual Community: Women in Sports
RELI	2315	History of non-Western Religions	HP	1000	Intellectual Communities
RELI	2320	History of Islam	INST	1010	International Studies Proseminar
RELI	2450	African Traditional Religions	ITEC	1000	Visual Literacy for Life and Learning
RELI	3275	World Christianities	KIN	1004	Foundations of Physical Education
RELI	3260	African Spirits in the New World	KIN	1005	Kinesiology, Health, and Teaching Physical Activity
RUSS	2140	Introduction to Reading	LANG	1030	Intellectual Community in Cinema, etc.
RUSS	3205	Russian Folklore and Folk Life	LIFE	1001	Biology as Culture
SOC	3000	Social Change	MATH	1305	Bit Streams and Digital Dreams
SOC	3050	Japanese Society	MOLB	1010	Science and Society
SOC	3100	Chinese Society	MUSC	1003	Introduction to University Life as a Music Major
SOC	4110	Sociology of International Development	NURS	1000	Introduction to the Intellectual Community in Nursing

PATB	1001	Discovering Careers in Veterinary Medicine
POLS	1111	Issues in Political Science
PSYC	1001	Issues in Psychology
PSYC	1111	Psychology and Social Justice
RELI	1100	Worlds of Religion
SOC	1100	Social Problems
SOWK	1001	Intellectual Community in Social Work
SOWK	1002	Intellectual Community: The Social Work Profession
SPPA	1010	Introduction to Communication Disorders
THEA	1020	Theatre and Dance Intellectual Community
THEA	1021	Freshman Seminar: Academic and Professional Issues in Dance
UWYO	1000	Intellectual Community of Undeclared Students
UWYO	1205	SSS Furst Year Seminar
UWYO	1450	Building Community, Affirming Diversity: Strategies for Success in College and Life
UWYO	1600	Veterans Transition Course
WMST	1020	Intellectual Community: Women in Sports
WMST	1030	Social Justice in the 21st Century
WMST	1090	Women in Contemporary Society
<b>Information Literacy (L)</b>		
AS	1000	Intellectual Community of Undeclared Students
ACCT	1020	Principles of Accounting II
AGEC	1000	Agriculture and Applied Economics Orientation
AGRI	1001	Intellectual Community and Information Literacy in Agriculture
AGRI	3000	Discovering and Utilizing Ideas and Information
ANSC	1000	Intellectual Community in Animal and Veterinary Sciences
ANTH	2000	Introduction to Linguistic Anthropology
ART	1310	Sculpture I
BOT	3100	Plants and Civilization
BOT	4100	Writing in Biological Sciences
CHEM	1001	The Chemical Community
CNSL	1000	Relationship Skills: Counseling in Action
CNSL	2200	Introduction to Student Leadership
COJO	1001	Issues in the Mass Media
COJO	1041	Issues in Human Communication
CRMJ	1005	Issues in Criminal Justice
EDSE	1000	Exploring Hot Topics in Secondary Education
EDST	1500	Education for Social Justice
ENGL	4025	Writing for the Web
ENR	1100	Environment & Natural Resources Problems & Policies
ENR	1400	Biodiversity: Science and Society
ES	1000	Orientation to Engineering
ES	1002	Introduction to Engineering Information Literacy
ESS	1000	Wyoming in the Earth System
FCSC	1010	Perspectives in Family and Consumer Sciences
GEOG	2150	Foundations of Geographic Information Science and Technology
GEOL	1001	Intellectual Community/Earth Sciences
HIST	3020	Historical Methods/Introduction to Historical Methodology
HLSC	1010	Exploring the Health Sciences
HLSC	1020	Intellectual Community: Women in Sports
HP	1020	Freshman Honors Colloquium I
HP	1151	Freshman Honors Colloquium I
INST	1010	International Studies Proseminar
ITEC	1000	Visual Literacy for Life and Learning
ITEC	2360	Teaching with Microcomputers
KIN	1004	Foundations of Physical Education
KIN	1005	Kinesiology, Health, and Teaching Physical Activity
LBRY	3010	Research from a Distance
LBRY	3020	Managing and Navigating the World of Information
LIFE	1001	Biology as Culture
MOLB	1010	Science and Society
MUSC	1003	Introduction to University Life as a Music Major
NURS	1000	Introduction to the Intellectual Community in Nursing
NURS	4055	Evidence-Based Nursing for the RN
NURS	4125	Evidence-Based Nursing
PHCY	6250	Drug Literature Evaluation
PATB	1001	Discovering Careers in Veterinary Medicine
POLS	1111	Issues in Political Science
PSYC	1001	Issues in Psychology
SOC	1100	Social Problems
SOWK	1001	Intellectual Community in Social Work
SOWK	1002	Intellectual Community: The Social Work Profession
SOWK	1900	Women and Leadership
SPPA	1010	Introduction to Communication Disorders
THEA	1020	Theatre and Dance Intellectual Community
THEA	1021	Freshman Seminar: Academic and Professional Issues in Dance
UWYO	1000	Intellectual Community of Undeclared Students
UWYO	1205	SSS Furst Year Seminar
UWYO	1450	Building Community, Affirming Diversity: Strategies for Success in College and Life
UWYO	1600	Veterans Transition Course
WMST	1020	Intellectual Community: Women in Sports
WMST	1900	Women and Leadership
ZOO	4100	Writing in Biological Sciences
<b>Oral Communication (O)</b>		
ARMY	3010	Leadership and Tactics II
COJO	1010	Public Speaking
COJO	1020	Communication and Civic Engagement
EDST	3000	Teacher as Practitioner
ENR	1000	Energy and Society
ERS	1000	Energy and Society
HP	2020	Freshman Honors Colloquium II
PETE	4720	Petroleum Engineering Design I
PETE	4735	Petroleum Engineering Design II
SOWK	1900	Women and Leadership
WMST	1900	Women and Leadership
<b>Physical Activity and Health (P)</b>		
NURS	3630	Nursing Therapeutics: Health Promotion
PEAC	1001	Physical Activity and Your Health
<b>Quantitative Reasoning (QA)</b>		
MATH	1000	Problem Solving
MATH	1100	Number and Operations for Elementary School Teachers
MATH	1400	College Algebra
MATH	1405	Trigonometry
MATH	1450	Algebra and Trigonometry
<b>Quantitative Reasoning (QB)</b>		
ENR	4500	Risk Analysis
ENR	4510	Applied Risk Analysis
MATH	1050	Finite Math
MATH	1105	Math for Elementary School Teachers II
MATH	2200	Calculus I
MATH	2350	Business Calculus
SOC	2070	Introductory Statistics for the Social Sciences
STAT	2000	Statistics and the World
STAT	2010	Statistical Concepts for Business and Management Science
STAT	2050	Fundamentals of Statistics
STAT	2070	Introductory Statistics for the Social Sciences



**Natural Science - Integrated Science (S)**

GEOL	1005	Earth History
GEOL	1600	Global Sustainability
LIFE	1002	Discovering Science

**Natural Science - Biological (SB)**

AECL	1000	Agroecology
AECL	2025	Horticultural Science
AECL	2026	Horticultural Sciences Laboratory
ANTH	1100	Introduction to Biological Anthropology
ENR	1200	Environment
ENTO	1000	Insect Biology (no lab)
ENTO	1001	Insect Biology (with lab)
KIN	2040	Human Anatomy
KIN	2041	Human Anatomy Laboratory
LIFE	1003	Current Issues in Biology
LIFE	1010	General Biology
LIFE	1020	Life Science
LIFE	2002	Global Ecology
PLNT	2025	Horticultural Science
PLNT	2026	Horticultural Science Laboratory
PSYC	4080	Physiological Psychology
ZOO	2040	Human Anatomy
ZOO	2041	Human Anatomy Laboratory

**Natural Science - Earth (SE)**

AECL	2010	Introduction to Soil Science
ASTR	1050	Survey of Astronomy
ASTR	1070	The Earth: Its Physical Environment
ATSC	2000	Introduction to Meteorology
ENR	1500	Water, Dirt, and the Earth's Environment
ESS	2000	Geochemical Cycles and the Earth System
GEOG	1010	Introduction to Physical Geography
GEOL	1070	The Earth: Its Physical Environment
GEOL	1100	Introduction to Physical Geology
GEOL	1200	Historical Geology
GEOL	1500	Water, Dirt, and the Earth's Environment
GEOL	2000	Foundations of Geology I
GEOL	2080	General Field Geology
GEOL	3080	General Field Geology
GEOL	3400	Geological Hazards
GEOL	3600	Earth & Mineral Resources
GEOL	3650	Energy: A Geological Perspective
SOIL	2010	Introduction to Soil Science

**Natural Science - Physical (SP)**

CHEM	1000	Introductory Chemistry
CHEM	1020	General Chemistry I
CHEM	1030	General Chemistry II
CHEM	1050	General Chemistry and Qualitative Analysis I
CHEM	1060	General Chemistry and Qualitative Analysis II
PHYS	1050	Concepts of Physics
PHYS	1090	Fundamentals of the Physical Universe
PHYS	1110	General Physics I
PHYS	1120	General Physics II
PHYS	1210	Engineering Physics I
PHYS	1220	Engineering Physics II
PHYS	1310	College Physics I
PHYS	1320	College Physics II

**U.S. and Wyoming Constitutions (V)**

ECON	1200	Economics, Law and Government
HIST	1211	United States History to 1865
HIST	1221	US from 1865
HIST	1251	Wyoming History
HP	1200	US and Wyoming Government
POLS	1000	American and Wyoming Government

**Writing 1 (WA)**

ENGL	1010	College Composition and Rhetoric
HP	1020	Freshman Honors Colloquium I

**Writing 2 (WB)**

AAST	2350	Introduction to African American Literature
AGEC	3400	Agricultural Law
AMST	2010	Introduction to American Studies
ANTH	3015	Introduction to the Music of the World's Peoples
ANTH	3300	Ethnographic Methods in Anthropology
ARE	3210	Civil Engineering Materials
CE	3210	Civil Engineering Materials
CHE	3040	Unit Operations Laboratory I
CLAS	2020	Classical Greek Civilization
CLAS	2040	Classical Roman Civilization
COJO	2100	News Writing and Reporting
ECON	2400	Economics and the Environment
EDST	3000	Teacher as Practitioner
ENGL	2005	Writing in Technology and the Sciences
ENGL	2020	Introduction to Literature
ENGL	2125	Writing in Popular Genres
ENGL	2030	Critical Reading and Writing
ENGL	2035	Writing for Public Forums
ENGL	2350	Introduction to African American Literature
ENGL	2410	Literary Genres
ENR	4000	Approaches to Environment and Natural Resource Problem-Solving
ESS	3480	Environmental Change
FCSC	2170	Clothing in Modern Society
FREN	3050	Third Year French I
GEOG	3480	Environmental Change
GERM	3050	Third Year German I
GERM	4080	German-English and English-German Translation
HP	2020	Freshman Honors Colloquium II
HIST	3020	Historical Methods/Introduction to Historical Methodology
LANG	3140	Anime: History and Culture
MUSC	3015	Introduction of the Musics of the World's Peoples
PETE	4720	Petroleum Engineering Design II
POLS	3500	Gender and Society
POLS	3600	American Political Thought
PSYC	2000	Research Methods in Psychology
REWM	4830	Ecological Applications for Wildlife Management
SOC	3500	Gender and Society
SPAN	3050	Intermediate Spanish Composition & Conversation
WMST	3500	Gender and Society
WMST	4400	Women and Work

**Writing 3 (WC)**

AAST	4100	African American Religious Culture	ENR	4900	Environment and Natural Resources Assessment Practice
AAST	4233	Race, Gender, Ethnicity in the Media	ERS	4900	Energy Resource Management Capstone
ACCT	4600	Ethics and Professionalism	ESE	4070	Energy Systems Design II
AECL	4990	Agroecology Seminar	ESS	4950	Exploring the Earth System
AGEC	4950	Senior Thesis I	FCSC	4127	Directing Preschool and Day Care Programs
AGEC	4960	Senior Thesis II	FCSC	4182	Textile Industry and the Environment
AGEC	4965	Agribusiness Strategy and Ethics Capstone	FREN	4140	17th Century French Literature
AIST	4460	American Indian Literature	GEOG	4051	Environmental Politics and Administration
AMST	4051	Environmental Politics and Administration	GEOG	4540	Topics in Cultural Ecology
AMST	4985	Senior Seminar	GEOL	3080	General Field Geology
ANSC	4630	Topics and Issues in Animal Science	GEOL	4820	Capstone
ANTH	4010	History of Anthropological Thought	GERM	3006	20TH Century German Culture and Civilization
BOT	4100	Writing in Biological Sciences	HIST	4030	Departmental Proseminar
CHE	4080	Process Design II	INST	4110	Sociology of International Development
COJO	3160	Theory of Language and Society	INST	4950	Capstone
COJO	4100	Investigative Reporting	KIN	3015	Teaching Lab II and Assessment in Physical Education
COJO	4110	Feature Writing Seminar	ME	4070	System Design II
COJO	4233	Race, Gender, Ethnicity in the Media	MOLB	4300	Writing in Molecular Biology
CRMJ	4280	Comparative Criminal Justice	NURS	4125	Evidence-Based Nursing
ECON	4240	History of Economic Thought	NURS	4255	Nursing Leadership
EDEL	4309	Elementary Literacy Methods	PETE	4735	Petroleum Engineering Design II
EDEL	4409	Elementary Math/Science Methods	PHCY	6250	Drug Literature Evaluation
EDSE	3278	Subject Matter Specific Methods I: Secondary Agriculture Education	PHYS	4690	Science Fact, Fiction and Future
EDSE	4254	Becoming a Reflective Practitioner: Specific Pedagogy in Music	POLS	4051	Environmental Politics and Administration
EDSE	4270	Subject Matter Specific Methods II: Secondary English Education	POLS	4850	Seminar in American Politics and Institutions
EDSE	4271	Subject Matter Specific Methods II: Secondary Mathematics Education	POLS	4890	Seminar in Comparative Politics
EDSE	4272	Subject Matter Specific Methods II: Art Education K-12	PSYC	4050	Experimental Psychology
EDSE	4273	Subject Matter Specific Methods II: Secondary Social Studies Education	PSYC	4220	Psychopharmacology
EDSE	4275	Subject Matter Specific Methods II: Secondary Science	PSYC	4740	Advanced Social Psychology
EDSE	4276	Subject Matter Specific Methods II: Secondary Modern Language Education	PSYC	4830	Senior Thesis in Psychology
EDSE	4277	Subject Matter Specific Methods II: Secondary Industrial Technology Education	RELI	4000	Theories of Religion
ENGL	4000	21st Century Issues in Professional Writing	RELI	4100	African American Religious Culture
ENGL	4010	Technical Writing in the Professions	REWM	4051	Environmental Politics and Administration
ENGL	4025	Writing for the Web	REWM	4900	Rangeland Management Planning
ENGL	4075	Writing for Non-Profits	SOC	3090	Social Research Methods
ENGL	4460	American Indian Literature	SOC	4110	Sociology of International Development
ENGL	4990	Senior Seminar	SOC	4650	Urban Sociology
ENR	4051	Environmental Politics and Administration	SOWK	4570	Social Work Research Project
			SPAN	4200	Introduction to Research
			SPPA	4750	Research Methods in Communication Disorders
			THEA	4200	20th Century Dance
			THEA	4330	History of American Musical Theatre
			THEA	4930	Theatre History I
			WMST	4233	Race, Gender, Ethnicity in the Media
			WMST	4700	Feminist Theories and Methodologies
			ZOO	4100	Writing in Biological Sciences

# Division of Student Affairs

408 Old Main, (307) 766-5123, Fax: (307) 766-2696

Sara Axelson, Vice President, Student Affairs

The Division of Student Affairs is the administrative unit of the university that is responsible for providing leadership and coordination of programs and services designed to support student learning and development in and outside the classroom.

In partnership with UW faculty, staff, and students, the Division of Student Affairs orchestrates the enrollment management departments of the University to recruit and retain a student body of the size and diversity appropriate to the needs of the state, the demands of the world of work, and the resources of the institution. The division also develops and delivers services, programs, and facilities that promote the intellectual, personal, cultural, and civic development of students; coordinates efforts to create a caring community in which individuals are respected, encouraged to pursue excellence, and achieve their potential; and fosters honoring the diversity of individuals and cultures.

There are three service clusters within the Division of Student Affairs which include Enrollment Management; Health and Wellness; and Residence Life, Dining Services, and the Wyoming Union. The Enrollment Management cluster consists of the Admissions Office; Center for Advising and Career Services; Office of the Registrar; Student Educational Opportunity which includes University Disability Support Services; and Office of Student Financial Aid. The Health and Wellness cluster includes Campus Recreation; the Dean of Students Office which includes Multicultural Affairs; Student Health Service; and the University Counseling Center which includes the university's drug and alcohol education program. The third cluster consists of Residence Life, Dining Services, and the Wyoming Union. The Associated Students of the University of Wyoming (ASUW) is also a part of the Division of Student Affairs and is an essential component of the support services structure designed to help students succeed.

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## Enrollment Management Admissions Office

**Shelley Dodd, Director of Admissions**  
150 Knight Hall, (307) 766-5160  
Web site: [www.uwyo.edu/admissions](http://www.uwyo.edu/admissions)

A new undergraduate student's first official contact with the University of Wyoming is often through the Admissions Office. This unit is responsible for recruiting/admitting undergraduate students to the university. Responsibilities include the development of effective school relations, programs with high schools and community colleges, recruitment of prospective freshmen and undergraduate transfer students, the orientation of new undergraduates, and the administration of resident/nonresident regulations for tuition classification. The Admissions Office determines initial scholarship eligibility for all new undergraduate students. This office also facilitates the admission process for graduate students. The Admissions Office also manages the International Students and Scholars office. A detailed description of admission to the university and procedures can be found in the admission policies section of this publication.

## International Students and Scholars

**Jill Johnson, Associate Director of Admissions**  
Cheney International Center, Suite 5, (307) 766-5193  
Web site: [www.uwyo.edu/ISS](http://www.uwyo.edu/ISS)

International students, numbering over 850 from nearly 90 countries, are a vital part of international education at the University of Wyoming. As such, International Students and Scholars (ISS) works to promote an interchange of ideas and understanding from among all of the countries represented on campus. ISS is responsible for recruitment of international students and provides advising and counseling to all international students/scholars for their academic, social, personal, and immigration concerns. The office also promotes and implements social and cultural activities for international awareness and educational exchange through International Education Week, Friendship Families, American Conversation Club, international coffee hours, and other special programs. Many of these activities are coordinated through the ISS-sponsored International Resource Center in the Cheney International Center, Room 1.

International students and visitors are required to contact International Students and Scholars to confirm their arrival at the University of Wyoming and to consider the office their primary contact for further information and assistance. Students must be enrolled as full-time students each semester as required by the U.S. Citizenship and Immigration Services. The ISS e-mail address is [uwglobal@uwyo.edu](mailto:uwglobal@uwyo.edu).

*National Student Exchange:* The University of Wyoming is a member of the National Student Exchange (NSE) consortium. Through NSE, students are provided an opportunity to attend one of more than 175 U.S. institutions in the NSE consortium. NSE offers a student the chance to live in another part of the United States and to travel and experience college life in different settings for an academic semester or a year under his or her normal UW tuition and fees. Financial aid is often available and academic credit is guaranteed to transfer back to UW.

For more information about the National Student Exchange, please contact International Students and Scholars, Cheney International Center, Suite 5 or call (307) 766-5193. The e-mail address is [uwglobal@uwyo.edu](mailto:uwglobal@uwyo.edu).

## Center for Advising and Career Services

**Jo Chytka, Director**  
222 Knight Hall, (307) 766-2398  
Web site: [www.uwyo.edu/CACS](http://www.uwyo.edu/CACS)

The Center for Advising and Career Services (CACS) provides a variety of services to UW students, including advising undecided students, and A&S undeclared students; providing academic support to various populations of probationary, conditionally admitted, and reinstated students; assisting students campus-wide with their career exploration, planning, and job search needs; assisting in coordinating discussions, information dissemination, and event planning between the various professional advisors and advising offices on campus; and coordinating national tests and exams through the University Testing Center in Knight Hall, Room 4.

CACS is committed to providing a comprehensive and integrated service that moves a student along a continuum of receiving academic advising, exploring academic and career options, selecting a college major, and finally, implementing his/her degree in the world of work.

Undeclared students and A&S students admitted with support, placed on probation, or reinstated to the university are highly encouraged to meet with a CACS career counselor. The purpose of this meeting is to analyze the student's past academic progress and future career goals to develop a strategic plan to maximize his/her academic success and future employment opportunities. CACS also works closely with other campus offices and departments to engage students in available study skill and tutorial resources.

Students interested in engaging in career exploration activities may make an appointment to meet with a career counselor to discuss their career goals and/or confirm their choice of major. Various assessment tools that provide feedback on the match between a student's interests or personality type and the world of work, are available. CACS career specialists provide information pertaining to a broad range of career fields, internship opportunities, specific employer information, general job search strategies, and federal government application processes.

Students are advised on how to use the UW2Career database on the CACS homepage to find out about and apply for summer, internship, and permanent job opportunities. Each year numerous employer representatives from business, industry, health care, education, and government visit CACS to interview students for these types of opportunities. All information pertaining to these visits is contained in the eRecruiting link on the CACS homepage. Students need to register with CACS to obtain their username and password.

CACS hosts numerous general and specialized job fairs each year for students and alumni. Upcoming job fair dates can be found on the CACS homepage.

*The University Testing Center:* The University Testing Center coordinates national tests and exams and is housed in the Knight Hall basement, Room 4. Students may register to take national tests and professional school entrance exams. Information is available on the University Testing Center web site [www.uwyo.edu/UTC](http://www.uwyo.edu/UTC) or by calling (307) 766-2188.

## Office of the Registrar

**Lane Buchanan, Interim Registrar**

**167 Knight Hall, (307) 766-5272**

**Web site: [www.uwyo.edu/registrar](http://www.uwyo.edu/registrar)**

The Office of the Registrar is responsible for overseeing course registration, transcripts, verification of enrollment, adding/dropping/withdrawing from courses, and for maintaining student academic records. This involves responsibility for web registration, as well as preparation and electronic publication of the fall and spring *Class Schedules*, *Summer Bulletin*, and *University Catalog*. The office is also responsible for the electronic degree audit program, graduate record processing, and for determining whether or not students have successfully met all degree requirements. Additionally, this office evaluates all transfer credit for undergraduate students to determine transferability as well as UW equivalents.

## Student Educational Opportunity (SEO)

**Pilar Flores, Director**

**330 Knight Hall, (307) 766-6189 (TTY: 307-766-3073)**

**Web site: [www.uwyo.edu/SEO](http://www.uwyo.edu/SEO)**

Student Educational Opportunity is composed of both on-campus and outreach projects with offices throughout Wyoming. These projects serve students who are first generation; income-eligible; students with cognitive, psychological or physical disabilities; ethnic minority students; and non-traditional students. SEO assists eligible students to plan and prepare for entry into higher education, succeed in the higher education environment, and graduate from college by providing academic success services, disability-related accommodations when appropriate, and instruction in basic skills, career, and personal development. All projects within SEO seek to increase the public awareness of the needs of ethnic minority, first generation, income-eligible students, and students with disabilities in an educational environment.

### *On-Campus Projects*

*McNair Scholars Program:* The McNair Scholars Program prepares students to pursue doctoral level study. Services include intensive academic support including tutoring and academic counseling; activities related to successful application to graduate school and pursuit of financial aid opportunities; preparation for the GRE; and faculty mentoring. The capstone of the program is a paid summer research internship program which prepares students for admission to graduate level education. Students who are juniors and seniors, income-eligible and first generation college students, or who are from ethnic minority groups underrepresented in graduate education qualify for program services. The McNair Scholars Project is a federally funded TRIO project. Note: this is a graduate school preparation program; it is not a scholarship program.

*Student Success Services:* The Student Success Services (SSS) project offers academic support to students who are first generation college students, income-eligible, and/or individuals with disabilities. Student Success Services provides assistance with academics, personal/social choices, financial issues and pursuit of financial aid opportunities, and choice of college major and related career opportunities. The SSS project also provides its students with individual and group tutoring. All services are free to eligible participants and services are intended to help students be successful in college and to stay in college through graduation. SSS is a federally funded TRIO project.

*University Disability Support Services:* University Disability Support Services (UDSS) provides a variety of services for students with physical, sensory, cognitive, or psychological disabilities including printed materials in alternative format, note-taking assistance, classroom relocation, testing accommodations, access to adaptive computers, parking assistance, advocacy, sign language interpreters, real-time transcribing, mobility orientation for the blind, as well as other academic support services. UDSS assists UW to meet its legal and ethical obligations under Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. Services are coordinated with the efforts of the Division of Vocational Rehabilitation and Wyoming Services for the Visually Impaired, when appropriate. Students with disabilities who anticipate needing accommodations to fully participate in classes and programs at the University of Wyoming are strongly encouraged to register with UDSS and provide documentation of their disability.

## Outreach Projects

*Educational Opportunity Center:* The Educational Opportunity Center (EOC) assists first generation and income-eligible adults throughout Wyoming to continue their education. Services include assistance with college and financial aid applications, career and college exploration, and GED preparation. Outreach offices are located in Casper, Cheyenne, Ethete, Evanston, Powell, Riverton, and Sheridan. EOC is a federally funded TRIO project.

*GEAR-UP Wyoming:* The Wyoming Statewide GEAR-UP project provides services to 2,000 income-eligible pre-college students throughout the state each year. Student services include career exploration, advising and supporting students in taking a college preparation curriculum, college preparation, ACT preparation, college exploration, application, and planning, and assistance with financial aid processes and procedures. Student services are provided through GEAR-UP coordinators located at each of Wyoming's seven community colleges. The GEAR-UP grant also works with the Wyoming Department of Education in providing teacher training and school improvement initiatives. All GEAR-UP services are aimed at increasing student academic preparation and performance levels suited for post-secondary education, rates of high school graduation, rates of post-secondary education participation and graduation, and GEAR-UP student and family knowledge of post-secondary education options, high school preparation needs, and means of financing.

*Upward Bound Math/Science:* The Upward Bound Math/Science Program (UBMS) provides services to income-eligible and first generation 9th through 12th grade high school students throughout Wyoming. UBMS is designed to generate the skills and motivation necessary to be successful in high school and to complete a college degree program in a math or science area. Assistance with high school coursework and tasks related to college enrollment are provided throughout the academic year. The UBMS program includes a six-week summer academic session with an intensified math and science curriculum that includes performing active research under the guidance of university staff and graduate students. UBMS is a federally funded TRIO project.

*Upward Bound:* The Upward Bound program works with income-eligible, first generation high school students (grades 9-12) and their families to help them gain the skills and motivation necessary to successfully complete high school and to pursue a college degree. The program includes a six-week summer academic component designed to help students develop academically and socially in a university setting. Tutorial and enrichment services are provided throughout the academic year and participants and their families receive individualized assistance in completing tasks related to successful college enrollment. Outreach offices are located in Albany, Fremont, Laramie, and Natrona counties. Upward Bound is a federally funded TRIO project.

## Office of Student Financial Aid

**Kathy Bobbitt, Interim Director**

**174 Knight Hall, (307) 766-2118**

**Web site: [www.uwyo.edu/SFA](http://www.uwyo.edu/SFA)**

The Office of Student Financial Aid assists students in obtaining funds to attend the University of Wyoming by coordinating and administering all forms of financial assistance to students. Four broad categories of aid are available: scholarships, grants, loans, and work-study employment. Over 1,000 different scholarship programs, funded through federal, state, institutional, and private sources, are coordinated. Federal Pell, and Federal Supplemental Educational Opportunity Grants are available to undergraduate students with significant financial need, who are pursuing a first bachelor's degree. Hathaway Scholarships, Federal Perkins, Federal Direct and Federal Direct PLUS Loans are available to qualified students. Federal Work-Study employment is available to students with a qualifying level of financial need. For additional information, please refer to the Student Financial Aid section in this catalog.

## Health and Wellness

### Campus Recreation

**Pat Moran, Director**

**Half Acre Recreation and Wellness Center**

**Phone: (307) 766-3370**

**Web site: [www.uwyo.edu/Rec](http://www.uwyo.edu/Rec)**

Our mission is to provide recreational opportunities to a diverse campus community that enhance the learning and workplace environment and promote mental and physical health via quality facilities, equipment, and programs. Our programs, which include open recreation, intramural sports, club sports, and the outdoor program, offer a broad range of coordinated activities for individuals and groups that promote health awareness, a sense of community and a lifelong appreciation for wellness and recreational activities. Supporting the value of student development, our programs strive to offer opportunities to students that develop leadership skills and promote responsibility while maintaining a balance between personal, professional, and academic pursuits.

### Open Recreation

**Half Acre Recreation and Wellness Center, First Floor**

**Phone: (307) 766-3370**

The Open Recreation program is housed primarily in newly renovated Half Acre Recreation and Wellness Center with additional recreational opportunities in the Corbett building on the east campus. UW's Open Recreation program, available to the entire student population, faculty, staff and spouses, provides quality equipment for individuals to participate in non-organized, informal activities such as basketball, volleyball, racquetball, or badminton. Patrons can also take advantage of swimming, weight training, aerobic training, personal training services, and group fitness and instructional classes. For more information on the open recreation program, stop by the Member Services window in the lobby of Half Acre, pick up a Campus Recreation brochure, or visit the Campus Recreation web site.

### **Intramural Sports**

**Half Acre Recreation and Wellness Center, Second Floor**

**Phone: (307) 766-4175**

UW's Intramural Sports program offers organized individual and team competitive sport events in men's, women's, and co-recreational leagues. Students and employees can participate in organized recreation level sport competition in approximately 30 activities per semester such as flag football, soccer, inner-tube water polo, wrestling, badminton, basketball, volleyball, or table tennis. Information is available from the Rec Sports Office or on the Campus Recreation web site. Every member of the university community is encouraged to become familiar with the many aspects of intramural sports, which are designed to encourage participation and socialization regardless of previous experiences, sport skills, or group affiliation. Come alone or with a group to sign up for a fun time.

### **Club Sports**

**Half Acre Recreation and Wellness Center, Second Floor**

**Phone: (307) 766-6396**

The Club Sports program offers a higher level of athletic sport competition than Open Recreation and Intramural Sports to UW students. Some of the current UW Club Sport teams for men and women include badminton, baseball, volleyball, soccer, ice hockey, rugby, cycling, Nordic ski racing, lacrosse, softball, racquetball, fencing, cricket, water polo, tennis, triathlon and equestrian. UW faculty or staff with an interest in coaching or officiating a club sport should contact the Rec Sports office. Visit our web site for more information on Club Sport teams and activities.

### **Outdoor Program**

**Half Acre Recreation and Wellness Center, First Floor**

**Phone: (307) 766-2402**

UW's Outdoor Program (OP) offers a variety of outdoor experiences as well as training to use the brand new indoor climbing and bouldering wall. Participants have opportunities to develop lifetime recreational skills, gain an appreciation and concern for our natural environment, and meet new people. OP sponsors a variety of seasonal programs and outings throughout the year. These activities range from day and weekend trips to nearby destinations to extended trips at unique destinations. OP also runs clinics and sponsors guest speakers, presentations, and other educational programs. Activities are offered for all skill levels through such venues as back country ski outings, trail running, snowshoe outings, back country hiking and camping trips, or rock climbing. OP provides an extensive line of rental equipment to the campus community. The Outdoor Program staff is ready to expose the university community to a whole new realm of experiences not available anywhere else on campus. Visit the office or our web site for more information on OP activities and services.

### **Dean of Students Office**

**Sean Blackburn, Dean of Students and Associate Vice**

**President for Student Affairs**

**128 Knight Hall, (307) 766-3296**

**Web site: [www.uwyo.edu/DOS](http://www.uwyo.edu/DOS)**

The Dean of Students Office (DOS) provides a variety of UW student support services. The staff in DOS work to enhance the quality of life for all UW students. Assistance with situational needs and student life concerns of individual students and groups of students regarding their personal, academic, and/or social welfare are coordinated by the DOS staff.

Several offices and programs comprise the Dean of Students Office. These include the Dean of Students, Multicultural Affairs, STOP Violence Program, Student Legal Services, welfare check, and Student Judicial Affairs, all located in Knight Hall. Fraternity and Sorority Life, Multicultural Resource Center, Rainbow Resource Center, Nontraditional Student Center, Women's Center, and Student Media offices are located in the Wyoming Union. The Veterans Services Center is located in 241 Knight Hall.

Services available through the Dean of Students Office include individual advisement and consultation regarding situational student life concerns; referral coordination with other university and community services; conflict resolution and consultation regarding student conduct, rights, and responsibilities; advisement in grievance procedures, due process, and student appeals of disputed decisions; official university withdrawals; and authorized absences and emergency contacts.

DOS staff also have responsibilities as advisers to ASUW and/or student organizations including Panhellenic and Interfraternity Councils, ASUW Nontraditional Student Council, United Multicultural Council, and Freshman Senate.

The professional staff provide direct assistance to students and groups at any time in the student's career at the university. Information, individual advisement and consultation, and assistance with administrative procedures are facilitated in the Knight Hall offices.

*Fraternity and Sorority Life:* The fraternities and sororities at UW provide a living/learning environment designed to support the goals of their members. Through intentional educational programs, the FSL program coordinator facilitates personal growth, scholastic achievement, and leadership development, and is available for individual and group consultation.

*STOP Violence Program:* The mission of the STOP Violence Program is to prevent domestic/relationship violence, sexual assault, and stalking on the campus of the University of Wyoming. Awareness and prevention efforts are provided by this office through outreach and educational activities. The coordinator works closely with the University Counseling Center (UCC), Campus Police (UWPD), Residence Life, and other offices to provide programs.

Another focus of the STOP Violence Program is to provide support and resources to students affected by violence. One resource is an on-campus advocate who can help a student access services through university departments and/or community agencies. Support is also offered by providing information to these students, their friends, and families, about the effects of domestic/relationship violence, stalking, or sexual assault. Walk-in hours are 10 a.m. to 4 p.m. weekdays, (307) 766-3296. For after hours emergencies, please call (307) 745-3556 (the Albany County Safe Project).

*Student Conduct, Rights and Responsibilities:* The Trustees, as a governing body of the university, are charged with the statutory duty and authority to make all rules and regulations including the administrative responsibility to regulate and control whatever conduct and behavior of the members of the university community impedes, obstructs, or threatens the achievement of the educational goals and mission of the university. The university community, in order to function in an orderly and creative manner, ascribes to a code of conduct to which the student must adhere. This information, entitled *Student Code of Conduct*, is distributed to each student who is granted admission to the university. This information and other university regulations are published in order to inform students of their rights and responsibilities and the minimum ethical standard of conduct expected of them as members of the university community. Additional copies of this information may be obtained at the Dean of Students Office or on the web.

*Student Media Office:* The Student Media Office is partially funded by student fees. It meets the informative, educational, and cultural needs of the university community through such publications as *The Branding Iron* (the daily student newspaper published Tuesday-Friday and weekly during the summer session), the literary magazine *Owen Wister Review* (published spring semester), and the feature magazine *Frontiers* (published fall and spring semesters) which are published under the auspices of the Board for Student Media.

The board is composed of students, faculty, staff, and selected members of the Wyoming Press Association. These publications provide an excellent opportunity for students to gain valuable experience in newspaper, magazine, advertising, sales, and production.

For more information about student publications, contact the Student Media Office, Room 302, Wyoming Union, (307) 766-6190.

*Student Legal Services:* Legal services are provided to University of Wyoming students by a full-time attorney. This service is provided through student fees to ASUW, and there is no additional charge for the attorney's time. The attorney assists students seeking advice in connection with personal legal problems. Information is readily available on a variety of subjects. Student Legal Services also facilitates the effective and prompt handling of legal referrals, (307) 766-6347.

### **Multicultural Affairs**

**Conrad Chavez, Manager, Multicultural Affairs**  
**Dean of Students Office**  
**117 Knight Hall, (307) 766-6193**  
**Web site: [www.uwyo.edu/oma](http://www.uwyo.edu/oma)**

Multicultural Affairs (MA) exemplifies its commitment to diversity and academic success through its various programs to provide academic and social support to ethnic minorities and all students interested in diversity and multiculturalism on the UW campus.

From academic programming consisting of our Discover Excellence and Continuing Excellence workshop series, a tutoring program, scholarship opportunities and individual meetings with staff, academic success can be achieved.

Socially, MA works to connect students with one of over 20 culturally diverse recognized student organizations as well as our own Multicultural Student Leadership Initiative program. Home to the Multicultural Resource Center, students can come and experience enhanced learning through gaining a greater self-understanding, advocacy in support of diversity, learning to appreciate individual similarities and differences, and enhancing feelings of engagement, belonging, and loyalty.

**Multicultural Resource Center (MRC)** - the place for personal and intellectual exploration on academic excellence, student leadership & advocacy, inter-cultural awareness, and diversity.

Located in Room 103 of the Wyoming Union, the MRC is a space provided by Multicultural Affairs which serves as a home-away-from-home for UW students. The MRC offers support services for students from all backgrounds in an environment that values diversity.

Numerous events take place at the MRC during the course of the year. Please join us for our Monthly Town Hall Meetings, Recognized Student Organization (RSO) events, and special presentations by guests who visit the UW campus.

The MRC houses collections of ethnic magazines, books and videos that have a focus on culture, diversity and academics. The MRC also provides access to eight computers, printers (black and white/color), study tables, a flat screen TV, and some of the most comfortable couches in the Wyoming Student Union. For more information call (307) 766-6463.

### **Nontraditional and Gender Programs**

**Dolores Cardona, Ph.D., Associate Dean of Students**  
**Dean of Students Office**  
**114 Knight Hall, (307)766-6228**

Nontraditional & Gender Programs, part of the Dean of Students Office, serve nontraditional students, women students, and LGBTQIA students through three student centers with peer connections and programming aimed at helping students to be successful at UW.

*Nontraditional Student Center:* The Nontraditional Student Center (NSC) serves as a supportive student center conveniently located in Wyoming Union 104 (766-6258) where nontraditional students or adult learners gather to study, use computers, socialize, meet other students, have an adult conversation, and find out information and resources for financial aid and scholarships, community services, and academic support while at UW. The NSC is also a location where many UW commuter students meet and work from while on the Laramie campus. Nontraditional students are students over 25 years of age, married, single parents, veterans, commuters, or students returning to college after several years away. For more information, visit the web site at [www.uwyo.edu/ntscenter](http://www.uwyo.edu/ntscenter).

*Women's Center:* Women's leadership and women's issues are also of concern to the Women's Center, regardless if you are a traditional or nontraditional undergraduate or graduate woman student. Programs like Women in Math, Science, and Engineering (WIMSE) are offered along with other programming of interest to women. Student computers and resources are available in Union 102 (766-6797). For more information, visit the web site at [www.uwyo.edu/womenscenter](http://www.uwyo.edu/womenscenter).

*Rainbow Resource Center:* The Rainbow Resource Center (RRC) serves as a resource for gay, lesbian, bisexual, transgender, queer (LGBTQIA) students, faculty and staff, their family and friends as well as the larger Laramie community. The RRC provides support, advocacy, education, the facilitation of programs, and a library of over 800 books on LGBTQIA issues. The center also has many other resources, including magazine titles, movies, network-connected computers with printing, and references to other services that are queer-friendly. Students gather to study, relax, and socialize in a safe environment. The RRC is located in Union 106. For more information, call (307) 766-3478 or visit the web site at [www.uwyo.edu/rrc](http://www.uwyo.edu/rrc).

### **Veterans Services Center**

**Marty Martinez**

**Dean of Students Office**

**241 Knight Hall, (307)766-6908**

Located in Knight Hall 241, the Veterans Services Center has resources, a computer lab, a lounge area, and a social “mess area” where veterans and their dependents, spouses, and friends can meet and support each other. Special events, programs, and student groups are coordinated out of the center. The staff works to improve access to and success in college for students who are veterans. For more information, call (307) 766-6908 or visit the web site at <http://www.uwyo.edu/vetservices/>.

### **Associated Students of the University of Wyoming (ASUW)**

**020 Wyoming Union, (307) 766-5204**

**Web site: [www.uwyo.edu/ASUW](http://www.uwyo.edu/ASUW)**

The Associated Students of the University of Wyoming (ASUW) is comprised of three branches: the Executive, Legislative, and Judicial. All full-time, fee-paying students are members of ASUW. Officers and 30 senators are elected annually by the students, and each senator represents one of the seven colleges. They meet weekly to consider areas of concern to students.

The ASUW student government represents student opinion to the administration, faculty, staff, and State of Wyoming legislature. ASUW participation across the university ensures that university policies are made with the concerns of students in mind. In addition, the ASUW president serves as an ex-officio (non-voting) member of the University of Wyoming Board of Trustees and conveys student opinion to the institution’s highest governing body.

ASUW also provides their own programs and services for students. Included in these programs are ASTEC (technical services), located in the Wyoming Union; Student Legal Services in Knight Hall; and several councils: Freshman Senate, Non-Traditional Student Council, Interfraternity Council, Panhellenic Council, and the United Multicultural Council.

### **Student Health Service**

**Joanne Steane, M.D., Director**

**Student Health Building, (307) 766-2130**

**Web site: [www.uwyo.edu/ShSer](http://www.uwyo.edu/ShSer)**

The Student Health Service (SHS) provides personalized health care to eligible students by maintaining a high quality medical outpatient clinic. The clinic provides primary health care, health education, and preventive services to enable students to complete their course of studies. The professional staff consists of four physicians, one nurse practitioner, a psychiatric nurse practitioner, one physician assistant, two registered pharmacists, and registered nurses, in addition to other professional and administrative personnel.

Undergraduate and professional full-time students taking 12 or more credit hours and graduate students taking 9 or more hours are eligible for services at the SHS. Undergraduate and graduate part-time students who have purchased the Optional Student Fee Package are also eligible. Enrollment in, or waiver from, the University of Wyoming Student Medical Insurance Program has no effect on eligibility to use the Student Health Service. Students enrolled during the summer pay

a summer fee for SHS. Students not enrolled for summer but who were enrolled spring semester and are pre-registered for fall semester may pay the same summer fee to be eligible to use the SHS. Payment of the fee provides visits with clinicians and nurses at no cost. Affordable laboratory diagnostic procedures, medications, and office procedures are available. There are also nominal charges for supplies such as ace bandages, splints, crutches, and other medical devices. A consultant nutritionist is also available.

The hours of the Student Health Service can be found on our web site. An after-hours nurse advice line is available when the SHS is closed at night and on weekends by calling (307) 766-2130. All students are urged to have adequate health insurance coverage for illnesses or emergency visits to the local hospital, urgent care clinic, or a physician’s office when the Student Health Service is closed. Insurance coverage is also recommended for medical care that is not available at the Student Health Service, including treatment of major injuries, surgery, and hospitalization. The student is responsible for all charges for services provided by persons or institutions outside of the Student Health Service.

### **University Counseling Center**

**Keith Evashevski, Psy.D., Director**

**341 Knight Hall, (307) 766-2187**

**Web site: [www.uwyo.edu/UCC](http://www.uwyo.edu/UCC)**

The University Counseling Center (UCC) provides comprehensive, time-effective mental health services to the university students and consultation on issues with parents, staff, and faculty. The UCC is a resource center for students to enhance personal success skills in dealing with the challenging and sometimes stressful university environment. The professional UCC staff work together with students to help them find effective ways to approach concerns and problems. Students are supported in learning to make healthy lifestyle choices that promote their personal, social, and academic goals. Group and individual counseling services, in a professional and confidential atmosphere, are provided to students with personal and interpersonal concerns. Other services include crisis intervention, walk-in consultation, and education to the UW community. Individual counseling appointments are made in person during regular office hours, 8 a.m. - 5 p.m. (summer hours: 7:30 a.m. - 4:30 p.m.) Monday through Friday. The UCC offers walk-in services, various hours a day, when students may simply walk in to be seen for a brief appointment, to determine future services they might need. Counseling services are free to UW students. For after-hour emergencies, students can talk to an on-call counselor by calling 766-8989.

*Campus Consultation and Outreach:* UCC staff consults with academic and student services personnel, student leaders, and university administration regarding counseling and mental health issues and ways to better the UW living/learning environment. Outreach programs can be initiated by student or staff request or by UCC staff bringing issues of concern to various campus populations. Some current issues include destigmatizing mental health, suicide prevention, respect for diversity, sexual orientation issues, and stress management. Generally, UCC asks for a minimum of two weeks notice for an outreach presentation; however, in urgent situations triggered by trauma, outreach programs will be offered on a shorter notice. The Center hosts the Lifesavers Coalition - a group of campus and community partners who have an interest in training others in the skills of suicide prevention, and also have a focus on how to be proactive with wellness.



UCC collaborates closely with the STOP Violence Program in the Dean of Students Office by providing counseling support to students who are victims of sexual violence as well as collaborative programming regarding prevention of sexual violence and membership with Campus Coalition for the Prevention of Sexual and Relationship Violence.

*AWARE (Alcohol Wellness Alternatives, Research and Education):* The AWARE Program is committed to a healthy campus community and a drug-free learning environment. AWARE Program staff utilize best practices in providing drug and alcohol education and prevention programming for the University of Wyoming campus and community. The AWARE Program promotes a standard of wellness in regard to healthy choices surrounding alcohol use and the prevention of illicit drug use by college students. To achieve these goals, the AWARE Program offers a broad range of services ranging from individual interventions to consultative and educational services for campus groups and the community at large. AWARE also coordinates the Cowboy UP Peer Education group. Additionally, the AWARE Program coordinates the A-Team, a campus-community coalition dedicated to reducing underage and excessive alcohol use. For more information, please visit the web site at [www.uwyo.edu/aware](http://www.uwyo.edu/aware) or feel free to contact via telephone at (307) 766-2187, email ([aware@uwyo.edu](mailto:aware@uwyo.edu)), or in person by visiting 341 Knight Hall.

## Residence Life, Dining Services, and Wyoming Union

### Residence Life & Dining Services

Eric Webb, Executive Director, Residence Life, Dining Services, and the Wyoming Union

Washakie Center, Lower Level, (307) 766-3175

Web site: [www.uwyo.edu/reslife-dining](http://www.uwyo.edu/reslife-dining)

Residence Life & Dining Services is committed to providing clean, comfortable and affordable housing and dining, with the belief that these elements are an essential component of a student's education, personal growth, and college experience.

The university operates seven furnished residence halls, a variety of furnished and unfurnished apartments, as well as Washakie Center, nine on-campus dining establishments and University Catering and Events.

*Residence Halls:* The residence halls provide convenient living, studying, educational programming & social activities and dining accommodations for the university community. Various living environments are available. Full-time, live-in professional staff and graduate assistants live in the community, along with student resident assistants. The staff is available to all students to help make residence hall living an enjoyable and productive part of campus life. We have seven residence halls for students:

- Downey Hall
- Hill/Crane Hall (for students of sophomore class standing and above)
- Honors House
- McIntryre Hall
- Orr Hall
- White Hall

The residence halls also provide several additional services to our students:

- Laundry facilities on-site in each hall
- On-site computer labs and study rooms
- Mail service
- Free tutoring in the Student Learning Center
- 24-hour emergency custodial & maintenance services
- Upgraded cable TV that includes channels like ESPN U, HBO, The Sundance Channel, and your own HBO GO account

Room assignments are made according to the date the completed contract form is received. The housing deposit is included in the enrollment confirmation deposit paid by new UW students. Students returning to UW who wish to live in the residence halls must pay the housing deposit when they complete their housing contract. Hall, roommate, and other preferences may be indicated on the contract and will be considered. Students wishing to room together should submit contracts together prior to the posted deadline of May 1.

New Student Live-in Policy: The UW Trustees have established a policy requiring all new students to live in the UW residence halls during their first academic year on campus and to take a minimum of the 12-accesses-per-week dining plan. The policy is based on extensive student development research indicating that a student's chance of academic success and satisfaction with the college experience greatly improves through the residential living experience.

For a student to be considered for an exemption to the policy, a request with appropriate documentation must be sent to Residence Life & Dining Services, Dept. 3394, 1000 E. University Ave., Laramie, WY 82071. Students will be considered exempt from the policy if they can provide documentation for one of the following:

- 21 years of age or older
- Married
- Single parent with custody of child(ren)
- Reside with parent(s) or legal guardian(s) within a 60-mile radius of Laramie or in a property purchased by parent(s) or legal guardian(s)
- Completion of two semesters as a full-time student or the equivalent credit hours at UW, or another university or college
- Have documented medical or health conditions prohibiting residence hall living

Students must apply for exemption prior to 5 p.m. the day before the halls open for the semester (August 26, 2015 for the fall 2015 semester). Housing accommodations at the University Apartments may be available for students who have children or minors living with them or students of sophomore status or above.

*Dining Services:* A variety of dining plans, services, and payment options are offered for on and off-campus students, faculty, and staff. Dining plans are identified by the number of times a customer may access Washakie Dining Center per week. Additional Dining Dollars can be added to any dining plan, allowing for additional meals and services at dining locations across campus.

All students living in the residence halls may choose between the “Unlimited-,” any 15-, or any 12- dining plans. Students living in Hill/ Crane Halls may purchase the any-7 or above dining plan. Meals are served during the contract periods for each semester. Limited services will be available over Thanksgiving and Spring Break.

Washakie Dining Center, the social and cultural hub of the residence halls, features marketplace dining with 10 serving platforms. Meals at the Washakie Dining Center can be purchased in several ways:

- UW Student ID card (WyoOne Card)
- Dining Dollars
- Cash previously deposited to the holder’s WyoOne account.
- Credit cards (VISA and MasterCard)
- Cash

Dining plans are not just for students living in the residence halls. Any student, staff member, or faculty member can purchase one of the varieties of dining plans designed to fit his/her needs.

For additional information about the residence halls, dining plans, or university apartments visit [www.uwyo.edu/reslife-dining](http://www.uwyo.edu/reslife-dining); call toll free (866) 653-0212; or if in Laramie, (307) 766-3175 (residence halls) or 766-3176 (university apartments); FAX (307) 766-3613 or email [reslife-dining@uwyo.edu](mailto:reslife-dining@uwyo.edu). Information may also be obtained by writing to Residence Life & Dining Services, Dept. 3394, 1000 E. University Ave., Laramie, WY 82071.

**Campus Dining Options:** In addition to Washakie Dining Center, a variety of convenient and affordable dining options are located in the Wyoming Union and throughout campus to further meet the dining needs of busy students. These locations offer unique atmospheres and customizable menu selections, with several locations open into the evening and on weekends. Each dining location accepts Dining Dollars, WyoOne card funds, Cash, Mastercard and Visa. Cash is not accepted at Elements. Plus, UW Campus Dining now offers Tapingo, a mobile food ordering application (download on your smartphone via the Apple or Google Play stores) available at most of the campus dining locations.

- Elements
- Pita Pit
- Rolling Mill Café
- CJ’s
- Snowy Range Top & Go
- S’Pokes Pizza
- Panda Express
- The Book & Bean
- Rendezvous

**University Apartments:** The University provides one and two-bedroom furnished or unfurnished apartments for students. Located on the east side of campus, the River Village, Landmark Village and Spanish Walk apartment communities are near shopping centers, recreational areas, and the hospital. The apartments also offer children’s programs and a community center.

Apartment assignments are made on a year-round basis. The date an application is received is used in determining assignment priority. Requests should be made as early as possible after acceptance to the university.

Bison Run Village offers an on-campus living community for single, upper-class students. The fully-furnished townhome style apartments are rented by the bedroom and feature shared kitchen, dining and living room spaces with single, private bedrooms and private or semi-private bathrooms. Applications for Bison Run Village open during the spring semester for the following fall semester.

Application forms and additional information about apartment rates, availability, and eligibility guidelines may be obtained by contacting Residence Life and Dining Services, (307) 766-3176, toll free at (866) 653-0212, email [reslife-dining@uwyo.edu](mailto:reslife-dining@uwyo.edu) or online at [www.uwyo.edu/reslife-dining](http://www.uwyo.edu/reslife-dining).

**Off-Campus Housing:** The University assumes no responsibility for the students’ choice of off-campus living environment. Students living off-campus are encouraged to contract for meals with Residence Life & Dining Services.

## Wyoming Union

**Darcy DeTienne, Director**

**001 Wyoming Union, (307) 766-3765**

**Web site: [www.uwyo.edu/Union](http://www.uwyo.edu/Union)**

The Wyoming Union is the community center for campus life, enhancing and complementing out-of-class educational experiences. Open daily, the Union provides facilities, services, and various activities to all of the campus community.

The Wyoming Union has a number of services available. A variety of food services, including Panda Express and Pita Pit, are located on the main level as well as CJ’s Convenience Store, the Copy and Print Center, Union Information Desk/Ticket Office, University Store, a computer lounge, the Multicultural Resource Center, the Nontraditional Student Center, Women’s Center, Rainbow Resource Center, and ATM service. The Campus Activities Center, Union administrative offices, ASUW Student Government, Center for Service, Leadership, and Community Engagement, Gallery 234, ASTEC (Associated Students Technical Services), Greek Affairs office, computer lab, Pete’s Game Room, program lounge, and the Gardens (appetizer and beverage bar) are located on the lower level.

The Wyoming Union Information Desk offers campus as well as community information and ticket sales. UW Dining Services provides meals, snacks and catering service. The Union’s conference and meeting facilities include rooms of various sizes and a large ballroom. For reservations and information on these services, contact the Events Office at (307) 766-3161.

### **Campus Activities Center**

The Campus Activities Center (CAC) serves as the hub of student activities on campus. Professional staff in the office offer guidance and assistance for programming committees, late-night programming efforts, more than 200 recognized student organizations (RSOs), and student leadership development.

Recognized student organizations at the University of Wyoming are established to promote a learning and social experience for individuals who share common interests. Students are encouraged to join and are free to organize associations that will provide opportunities to participate in educational, academic, cultural, and social activities. The staff in the Campus Activities Center is available to help groups of students develop organizations, sponsor activities, and coordinate efforts with other entities on campus. A complete listing and descriptive classification of all current recognized student organizations is available from the CAC and online at [www.uwyo.edu/cac](http://www.uwyo.edu/cac).

The CAC is also home to a number of campus-wide programming committees. These include:

- Friday Night Fever (FNF) (coordinating free alternative programming every Friday night and some Saturdays)
- The Student Activities Council (SAC), (coordinating free quality entertainment and activities for all students throughout the academic year)
- The Concerts and Convocations Committee (C&C) (coordinating big-name entertainment at an affordable ticket price)
- Visual and Cultural Arts (VCA) (coordinating Gallery 234 exhibits and culturally diverse programs throughout the year)

Students who participate in the leadership of any of these committees or organizations gain valuable hands on experience in negotiation, programming, problem solving, marketing, public speaking, teamwork, and leadership, as well as opportunities for personal growth.

### ***The Service, Leadership, and Community Engagement Center (SLCE)***

The Service, Leadership, and Community Engagement Center (SLCE) is located on the lower level of the Wyoming Union. SLCE is predicated on the notion that universities have a responsibility to prepare all students for active citizenship. A healthy American democracy demands ethical, engaged leadership, and SLCE seeks to cultivate these ideals among our UW students. Students are invited and encouraged to visit the office in Rooms 006 and 011 in the Wyoming Union to explore the many opportunities available, including:

- First Year Institute
- Alternative Breaks
- Local and national days of service
- Good Mule Project
- Leadership development programs
- Community engagement programs

# Other University Services

## University Store

**Misty Eaton, Manager**

**Wyoming Union, 1-800-370-2676, (307) 766-3264,**

**TTY: (307) 766-3267**

**Web site: [www.uwyostore.com](http://www.uwyostore.com);**

**[www.facebook.com/uwyostore](http://www.facebook.com/uwyostore)**

The University Store is a self-supporting university department founded in 1921. It provides students, faculty, staff, and campus visitors with a variety of products and services. In order to fulfill its primary mission, the store stocks new and used textbooks, textbook rentals, e-textbooks, general books, school supplies, office products, educationally priced computer software, fine art supplies and electronics. The University Store is an authorized Lenovo distributor and an Apple Authorized campus store offering a full line of Apple products and accessories. As a convenience, the store also stocks additional items such as gifts, insignia gifts and clothing, greeting cards, candy and sundries. Services the store provides include prepaid textbook reservations, bookbinding, special order book service, cap and gown rental, used book buyback, and postage stamps, as well as UPS, FAX and Federal Express.

The University Store is located on the main level of the Wyoming Union. Hours of operation during the academic year are: 7:30 a.m. to 5:00 p.m., Monday through Friday; TBA Saturday.

## Music

**Theresa Bogard, Department Head**

**258 Fine Arts Center, (307) 766-5242**

**Web site: [www.uwyo.edu/music](http://www.uwyo.edu/music)**

The Department of Music offers many opportunities for students to participate in musical activities, as well as, to hear concerts by faculty artists, student ensembles and visiting artists. All qualified students within the university, no matter their major, are invited to participate for credit in any of the following: Marching Band, Symphonic Band, Wind Ensemble, Symphony Orchestra, Chamber Orchestra, Collegiate Chorale, Opera Theater, Jazz Band, Bel Canto, Singing Statesmen, Civic Chorus, and the many smaller ensembles such as string ensembles, brass ensembles, percussion ensemble, and various chamber groups. Note: some ensembles are by audition only. Private lessons on any instrument and voice are available at a fee to all interested students.

Summer offerings may include lessons, workshops, seminars, and regular courses. A summer music camp for students in grades 7 through 12 is also offered which includes band, choral, orchestral and keyboard experiences culminating in gala concerts. For further information, please write to the Department of Music, Dept. 3037, 1000 E. University Ave., Laramie, WY 82071 or [musicdpt@uwyo.edu](mailto:musicdpt@uwyo.edu).

## Theatre and Dance

**Leigh Selting, Department Head**

**205 Fine Arts Center, (307) 766-2198**

Theatre and Dance at the University of Wyoming offers students an excellent opportunity to participate in all aspects of theatre and dance arts. Auditions for productions are open to all qualified students within the university regardless of major or college. The production program provides opportunities for students to participate in technical theatre stage crews, set construction, costuming, lighting and sound. There are also opportunities to perform dance, drama, musicals and operas. Playwriting, screen writing, directing and choreography are available through upper-division courses. The Fine Arts Center contains a proscenium theatre, an experimental theatre, an acting for the camera studio and a dance studio, plus full support facilities for scene and costume construction. Full-time university students may purchase tickets through the Fine Arts Ticket Office at a greatly reduced price.

## University Police Department

**Mike Samp, Chief of Police**

**1426 E. Flint, (307) 766-5179**

**Web site: [www.uwyo.edu/UWPD](http://www.uwyo.edu/UWPD)**

The University Police Department is responsible for crime prevention, public safety, and law enforcement in the UW community. The department is staffed by 14 certified peace officers, four security guards, and eight full-time staff members. All officers are fully trained and have arrest authority. The department operates 24 hours per day, 365 days a year. To keep members of the UW community aware of police activity on campus, the department maintains a chronological log of all incidents reported to the department. This log is open for public inspection through the UWPD web site. University crime reports are also included annually in the United States Department of Justice publication, Crime in the United States. Crime statistics, as well as other public safety information, are included in the Annual Security/Clery Report, which is available online. Department personnel present public safety programs upon request to any group or organization. Further information is available through the UWPD World Wide Web site.

**Bicycle Regulations** The University of Wyoming Bicycle Program was developed to promote an environment in which bicycles, pedestrians, and motor vehicles can safely co-exist. Persons riding bicycles are asked to familiarize themselves with the regulations and bike paths described in the pamphlet *Safe Cycling at UW*, which is available on the University Police Department web site. All bicycles must be registered.

**University of Wyoming Alumni Association**  
**Keener Fry, Executive Director**  
222 South 22nd Street, (307) 766-4166  
Web site: [www.uwyo.edu/alumni](http://www.uwyo.edu/alumni)

The University of Wyoming Alumni Association has been serving the university and alumni since the association was first organized in 1895. The primary role of the UWAA is to connect and reconnect alumni to the institution and each other through effective communication and meaningful engagement. The Alumni Association creates partnerships that advance UW and enrich the lives of students and alumni worldwide.

The Alumni Association currently serves nearly 119,000 former students of the University of Wyoming. UWAA provides scholarships to Wyoming and out-of-state high school seniors, undergraduate and graduate students, non-traditional students, Wyoming community college transfer students, veterans and underrepresented multicultural students with a commitment of over \$100,000 annually. UWAA promotes faculty excellence and development with its annual Outstanding Faculty Award. The Outstanding Faculty Award was created for graduating seniors who wish to nominate a teacher/professor who made a difference in their college careers.

In the fall of 2014, the UWAA expanded its external alumni relations activities to the Marian H. Rochelle Gateway Center and joined the Admissions Office, the Center for Advising and Career Services, and the UW Foundation to offer enhanced services to students and alumni. The historic Alumni House, located at 214 South 14th Street, continues to serve the central campus and our students.

The *Wyo-gold*/Student Alumni Association works to increase student awareness of what the Alumni Association means to the university. Each year, *Wyo-gold* also sponsors the UW Homecoming Parade and senior send-off.

**Cowboy Parents**  
**Office of Alumni Relations**  
214 S. 14th Street, (307) 766-4166  
Web Site: [www.uwyo.edu/cowboyparents](http://www.uwyo.edu/cowboyparents)

Cowboy Parents is an organization that provides parents and families with their own University of Wyoming connection serving as a conduit for information and assistance. Cowboy Parents offers opportunities for families to get involved with the goal of promoting student success while also providing the institution with a unique perspective from parents and families. Cowboy Parents provides email updates, frequent and timely publications, volunteer opportunities, and much more.

# University Outreach Programs

## University Outreach Mission

In the exercise of our primary mission to promote learning, we seek to provide academic and co-curricular opportunities that will:

- Expose students to the frontiers of scholarship and creative activity and the complexities of an interdependent world;
- Ensure individual interactions among students, faculty, and staff;
- Nurture an environment that values and manifests diversity, free expression, academic freedom, personal integrity, and mutual respect; and
- Promote opportunities for personal growth, physical health, athletic competition, and leadership development for all members of the University community.

As Wyoming's only university, we are committed to outreach and service that extend our human talent and technological capacity to serve the people in our communities, our state, the nation, and the world.

## Outreach Units

The University of Wyoming serves the state through its two outreach units, each of which is an integral part of the university's mission. The two units consist of the University of Wyoming Extension and the Outreach School.

### University of Wyoming Extension

**Glen Whipple, Director**

**103 Agriculture Building, (307) 766-5124**

The 1914 Smith-Lever Act created the University of Wyoming Extension, stating that its purpose was to "provide instruction and practical demonstrations in agriculture, home economics and related subjects." The University of Wyoming Extension is part of a national educational network which establishes partnerships with the United States Department of Agriculture, the state of Wyoming, the University of Wyoming, and county and tribal governments. UW Extension maintains offices in 27 Wyoming communities.

The mission of the University of Wyoming Extension is to provide lifelong learning opportunities for the people of Wyoming and empower them to make choices that enhance their quality of life. To accomplish its mission, the UW Extension continually updates its programs to meet the changing priorities, organizational structures and external relationships of Wyoming and its citizens. It is a dynamic organization pledged to providing educational programs which enable Wyoming citizens to improve their lives and communities through partnerships that put experience and research knowledge to work. The UW Extension delivers university research-based knowledge to Wyoming consumers through the broad program areas of Profitable and Sustainable Agricultural Systems, 4-H and Youth Development, Nutrition and Food Safety, Sustainable Management of Rangeland Resources, and Community Development Education. Programs include a wide range of topic areas, including food and nutrition, water quality, wildlife, crop production, resource management, and energy related issues.

UW Extension can be accessed on campus through its administrative offices in the College of Agriculture and Natural Resources. In the state, UW Extension offices are found in each county and serve as resources to the county, while also representing a major connection between the university and the people of Wyoming.

## Outreach School

**Susan Frye, Ph.D., Dean, Outreach School**

**R. Scott Seville, Ph.D., Associate Dean, Interim Director,**

**UW-Casper and Professor of Zoology and Physiology**

**W. Reed Scull, Ed.D., Associate Dean and**

**Director, Outreach Credit Programs**

**Anne Alexander, Associate Dean and Director,**

**International Programs**

**Dept. 3106, 1000 E. University Ave.**

**Laramie, WY 82071**

**333 Wyoming Hall, (307) 766-3152**

**Web site: [uwyo.edu/outreach](http://uwyo.edu/outreach)**

The mission of the Outreach School is to extend the University of Wyoming to our state and the world, while bringing the world to Wyoming. Our programs and services are organized under five units, with UW Outreach Regional Centers located in communities throughout Wyoming.

The five units of the Outreach School working in partnership to deliver a broad spectrum of UW programs are:

## Division of Outreach Credit Programs

**W. Reed Scull, Ed.D., Associate Dean and Director**

**Web site: [uwyo.edu/outreach/ocp](http://uwyo.edu/outreach/ocp)**

The University of Wyoming was the first university west of the Missouri to offer correspondence courses. For over a century UW has sent its faculty across the state to meet with citizens, students, teachers, business owners, ranchers, and farmers to help them learn. Today the Division of Outreach Credit Programs, in partnership with the university's colleges and departments, extends the university learning experience to students across the state and nation with audio, video conferencing, independent learning via correspondence or semester based, and Web-based or online instruction.

Using on-site, online, and mediated instruction, the division delivers UW baccalaureate degree completion programs as well as certificate and graduate degree programs. Upper division undergraduate- and graduate-level courses are also offered to satisfy continuing professional education requirements or to meet requests for professional development. The division also offers a wide variety of educational opportunities for teachers in collaboration with the College of Education and school districts.

## Undergraduate Majors

Social Science

Agroecology "3+1" (requires one year in Laramie)

Bachelor of Applied Science

Business Administration (online)

Criminal Justice

Family and Consumer Sciences (online)

Psychology

RN to BSN (online)

Accelerated BSN (2<sup>nd</sup> Bachelor's)

**Graduate Majors**

Master of Business Administration (online) (MBA)  
 English  
 Public Administration (MPA)  
 Kinesiology and Health  
 Nursing—Nurse Educator (online)  
 Speech-Language Pathology (currently in redesign for Fall 2015)

*College of Education - Master of Education Programs*

Educational Administration in Adult and Post-Secondary  
 Education (online)  
 Educational Administration in K-12 Educational Leadership  
 Instructional Technology (online)  
 Curriculum and Instruction  
 Special Education

**Doctoral Program**

Educational Administration in Adult &  
 Post-Secondary Education  
 Educational Administration in K-12 Educational Leadership  
 Nursing Practice (DNP)

**Certificate and Endorsement Programs**

Land Surveying Certificate  
 School Social Work Graduate Preparatory Certificate

*College of Education Programs*

Early Childhood Program Director Certificate  
 Teachers of American Indian Children Certificate/Endorsement  
 Early Childhood, Birth to Five Endorsement  
 Early Childhood, Birth to Eight Endorsement  
 Early Childhood, Special Education Endorsement  
 Literacy Certificate/Endorsement  
 Online Instruction Certificate  
 Principal in K-12 Educational Leadership Certificate/  
 Endorsement  
 English as a Second Language (ESL) Endorsement/Certificate  
 Special Education Endorsement/Certificate  
 School District Superintendent in K-12 Educational Leadership  
 Endorsement/Certificate  
 Special Education Director Endorsement

Audio conferencing uses long-distance telephone lines and a centrally-located audio conferencing bridge to link as many as 96 class sites at a time. These courses usually can be delivered to any location at which there is a telephone line, provided at least three students are enrolled at each site. If a course is offered statewide or nationwide, students in any location may take the course as long as there is sufficient enrollment at that site. Audio conferencing courses may include recorded lectures as well as an online component that provides a number of communication and information sharing tools.

Video conferencing is an interactive technology enabling students at each site to see and hear each other and their instructor. Video conference courses can be delivered to specific sites in Wyoming. Video conference courses may include an online component.

Web-based and online courses are available “anytime, anyplace.” They are, however, semester-based and often include specific times for student and faculty dialogue. Learning online is interactive and collaborative; students generally need to be online in class a few times each week throughout the semester. Students and instructors share discoveries and materials throughout each developmental step of the course using online communication tools such as e-mail, threaded discussions, document sharing, and live chat sessions.

Hybrid courses are delivered through a combination of web-based instruction and one or more other delivery methods.

Correspondence study courses, or print-based courses, meet the needs of site-bound students by offering a variety of study opportunities. These courses are designed to provide flexibility with open enrollment throughout the year, a more self-paced and independent study format, and nine months to complete each course. For further information, contact the Division of Outreach Credit Programs, Dept. 3274, 1000 E. University Ave., Laramie, WY 82071; (800) 448-7801; or e-mail: ocp@uwyo.edu

**International Programs Office**

**Anne Alexander, Associate Dean and Director**  
**(307) 766-3677**

**Web site: [uwyo.edu/intprograms](http://uwyo.edu/intprograms)**

The International Programs Office is the home of internationalization at the University of Wyoming. Explore what we do for the campus community to promote global citizenship - you can start here, and go anywhere.

**University of Wyoming at Casper**

**Scott Seville, Ph.D., Associate Dean and Interim Director**  
**125 College Drive, Casper WY 82601**  
**(307) 268-2713**

**Web site: [www.uwyo.edu/outreach/uwcasper/](http://www.uwyo.edu/outreach/uwcasper/)**

Since 1976, the University of Wyoming-Casper (UWC), in partnership with Casper College, has offered on-site courses and a slate of university degree programs in Casper. UW-Casper is also the location in Natrona County for statewide degree programs and classes offered through Outreach Credit Programs.

UW-Casper was established to meet the needs of students unable to move to Laramie. Some of these students are nontraditional students who may be older or have families, homes, or jobs in the Casper area. UW-Casper is designed to meet the academic needs of students in a setting that provides small class sizes, dedicated staff, and award-winning faculty. Courses are taught by resident and visiting faculty who are regular or part-time members of UW academic departments. A full-service office handles admission, registration, financial aid, and advising.

Classes are taught on-site in the Union/University Building at the Casper College campus. On average, more than 700 students enroll in UW courses and degree programs through UW-Casper each semester, and more than 3,000 students have received their UW degrees.

**Undergraduate Majors**

Applied Science  
 Biology  
 Business Administration  
 Communication  
 Criminal Justice  
 Elementary Education  
 English  
 Family and Consumer Sciences  
 Humanities and Fine Arts  
 Journalism  
 Mathematics and Science  
 Medical Laboratory Sciences - Coming Soon  
 Nursing  
 Psychology  
 Secondary Science Education, Biology  
 Social Science  
 Social Work  
 Technical Education

**Graduate Majors Offered - available statewide, offered through Outreach Credit Programs**

Adult and Post-Secondary Education  
Curriculum and Instruction  
Educational Leadership  
English  
Executive MBA (Online)  
Instructional Technology  
Kinesiology and Health  
Nursing—Nurse Educator  
Public Administration (MPA)  
Social Work  
Speech-Language Pathology

**Doctoral Degrees Offered - available statewide through Outreach Credit Programs**

Adult/Post-Secondary Education, Ed.D., Ph.D.  
Educational Administration in K-12 Educational Leadership, Ed.D., Ph.D.  
Nursing Practice, DNP

**Certificate Programs Offered - available statewide, offered through Outreach Credit Programs**

Early Childhood Mental Health  
Early Childhood Program Director  
Land Surveying  
Teachers of American Indian Children

**Endorsements - available statewide, offered through Outreach Credit Programs**

Early Childhood, Birth to Five  
Early Childhood, Special Education  
English as a Second Language  
Principal  
Special Education  
Wyoming Reading

For more information, contact UW-Casper at 125 College Drive, Casper, WY 82601; (307) 268-2713, (877) 264-9930; or e-mail: [osuw@uwyo.edu](mailto:osuw@uwyo.edu).

**Division of Outreach Technology Services**

**Tony Pedersen, Director**

**Web site: [uwyo.edu/outreach/ots](http://uwyo.edu/outreach/ots)**

The Division of Outreach Technology Services (OTS) provides technological support for the programs and services offered through the Outreach School. The division units are University of Wyoming Television (UWTV) and OTS, in partnership with UW's IT Division, manages and operates the Outreach Video Network (OVN) at 50 sites in 21 communities statewide.

UWTV provides full professional services for video production, programming, and distribution. These services also include streaming video, video conferencing, and video/DVD duplicating. Instructional TV conferencing classrooms on the Laramie campus are utilized primarily for Outreach credit courses. UWTV's production facilities include a full production studio, several single cameras for on-location productions, three Avid edit suites, and DVD duplication and stream-

ing services. All of the services are available to government clients, educational institutions, and non-profit organizations at modest rates. UWTV accepts commercial clients at appropriate rates.

For further information, contact the Division of Outreach Technology Services, Dept. 3106, 1000 E. University Ave., Laramie, WY 82071; (307) 766-4999; [tpeder@uwyo.edu](mailto:tpeder@uwyo.edu).

**Wyoming Public Media**

**Christina Kuzmych, General Manager**

**Web site: [wyomingpublicmedia.org](http://wyomingpublicmedia.org)**

Wyoming Public Media (WPM) delivers three radio services to residents of Wyoming and beyond, as well as internet streaming, podcasts, and web information services via [wyomingpublicmedia.org](http://wyomingpublicmedia.org). Wyoming Public Radio (WPR) is WPM's primary service and is the state's only National Public Radio member. WPR has been serving Wyoming for 47 years with news, music, and entertainment, now with 27 FM stations and translators statewide. WPM also operates two full time music services, Classical Wyoming and Jazz Wyoming with FM, HD-2, and HD-3 networks expanding across Wyoming.

*Wyoming Public Radio (FM and HD Stations)*

Afton: KUWA-FM 91.3 and in HD 91.3-1  
Alta/Driggs: KUWR- FM 91.3  
Buffalo: KBUW-FM 90.5 and in HD 90.5-1  
Casper: KUWC-FM 91.3 and in HD 91.3-1  
HD Classical Wyoming 91.3-2 and  
HD Jazz Wyoming 91.3-3  
Cheyenne: KUWR-FM 91.9 and in HD 91.9-1  
HD Classical Wyoming 91.9-2 and  
HD Jazz Wyoming 91.9-3  
Cody: KUWP-FM 90.1 and in HD 90.1-1  
HD Classical Wyoming 90.1-2 and  
HD Jazz Wyoming 90.1-3  
Douglas: KDUIW-FM 91.7  
Dubois: KUWR 91.3  
Evanston: KUWZ 89.7  
Fort Washakie: KUWW-FM 90.9  
Gillette: KUWG-FM 90.9 and in HD 90.9-1  
Green River: KUWZ-FM 90.5 and in HD 90.5-1  
Classical Wyoming FM 88.5  
Jackson: KUWJ-FM 90.3 and in HD 90.3-1  
HD Classical Wyoming 90.3-2  
HD Jazz Wyoming 90.3-3  
Kaycee: KUWK-FM 88.7  
Lander: KUWW-FM 90.9  
Classical Wyoming FM 91.9  
Laramie: KUWR- 91.9 and in HD 91.9-1  
Classical Wyoming 88.5 and HD 91.9-2 and  
Jazz Wyoming 90.1 and HD 91.9-3  
Lusk: KUWV-FM 90.7  
Newcastle: KUWN-FM 90.5 and in HD 90.5-1  
Pinedale: KUWX-FM 90.9 and in HD 90.9-1  
Powell: KUWP-FM 90.1 and in HD 90.1-1  
Rawlins: KUWI-FM 89.9



Riverton: KUWT-FM 91.3 and in HD 91.3-1  
 Jazz Wyoming 90.5  
 Rock Springs: KUWZ-FM 90.5 and in HD 90.5-1  
 Classical Wyoming FM 88.5  
 Saratoga: KUWI-FM 89.9  
 Sheridan: KSUW-FM 91.3 and in HD 91.3-1  
 Sundance: KUWD-FM 91.5 and in HD 91.5-1  
 Thermopolis: KUWT-FM 91.3 and in HD 91.3-1  
 HD Classical Wyoming 91.3-2 and  
 HD Jazz Wyoming 91.3-3  
 Torrington: KUWR-FM 89.9  
 Worland: KUWT-FM 93.3

Stream all services at [WyomingPublicMedia.org](http://WyomingPublicMedia.org).

For further information, contact Wyoming Public Media at Dept. 3984, 1000 E. University Ave., Laramie, WY 82071-2000; (307) 766-4240 in Laramie, or (800) 729-5897 within Wyoming.

### UW Outreach Regional Centers

An academic coordinator administers each Outreach Regional Center. These individuals are responsible for coordinating adult education and educational activities sponsored by the university and the Outreach School. Please visit <http://www.uwyo.edu/outreach/regional-centers.asp> for more information.

#### NORTHEAST REGIONAL CENTER—SHERIDAN

Serving Campbell, Crook, Johnson, and Sheridan Counties  
 Box 1500, WATT Building, Sheridan, WY 82801  
 (307) 672-8737

#### NORTHEAST REGIONAL CENTER—GILLETTE

Serving Campbell, Crook, Johnson, and Sheridan Counties  
 300 West Sinclair, Gillette, WY 82718  
 (307) 686-0044

#### NORTHWEST REGIONAL CENTER—POWELL

Serving Big Horn, Park, and Washakie Counties  
 231 West 6th Street, Powell, WY 82435  
 (307) 754-6108

#### NORTHWEST REGIONAL CENTER—CODY

Serving Big Horn, Park, and Washakie Counties  
 1501 Stampede Ave., Unit 9020, Cody, WY 82414  
 (307) 587-9837

#### SOUTHEAST REGIONAL CENTER—CHEYENNE

Serving Laramie and Platte Counties  
 Laramie County Community College Career & Technical Bldg.  
 1400 East College Drive, Cheyenne, WY 82007  
 (307) 632-8949

#### EASTERN REGIONAL CENTER—TORRINGTON

Serving Converse, Goshen, Niobrara, and Weston Counties  
 at Eastern Wyoming College  
 3200 West “C” Street, Torrington, WY 82240  
 (307) 532-8204

#### SOUTHWEST REGIONAL CENTER—ROCK SPRINGS

Serving Carbon, Lincoln, Sublette, Sweetwater, and Uinta Counties  
 at Western Wyoming Community College  
 2500 College Drive, Box G-340, Rock Springs, WY 82901  
 (307) 382-1817

#### WEST CENTRAL REGIONAL CENTER—RIVERTON

Serving Fremont, Hot Springs, and Teton Counties  
 2660 Peck Avenue, Box 58, Riverton, WY 82501  
 (307) 856-8651

#### WEST CENTRAL REGIONAL CENTER—JACKSON

Serving Fremont, Hot Springs, and Teton Counties  
 at Center for the Arts Building  
 240 S. Glenwood, P.O. Box 4901, Jackson, WY 83001  
 (307) 734-0224

#### NATRONA COUNTY—UW at Casper

125 College Drive, Casper, WY 82601  
 (307) 268-2713

# Special Programs and Facilities for Research and Study

## The Libraries

**Mary M. Farrell, Dean**

**William Robertson Coe Library, (307) 766-3279**

The University Libraries include the William Robertson Coe Library, the Emmett Chisum Special Collection; the Library Annex, located in the basement of the Biological Science Building, housing government publications and older journals; the Brinkerhoff Earth Resources Information Center, located in the S.H. Knight Geology Building; the Learning Resource Center, located in the Education Building; the Rocky Mountain Herbarium Research Collection, located in the Aven Nelson Building; and the National Park Service Research Center collection in Jackson, Wyoming. UW-Casper is served by the Casper College Goodstein Foundation Library.

The libraries' cataloged collections total over 1.6 million volumes, with over 33,000 volumes added annually. 14,000 active periodical and serial titles are supplemented with access to over 90,000 unique electronic journals and over 800,000 ebooks. In addition, the libraries provide extensive microforms collections and a library of over 175,000 maps, and serve as a depository for United States government publications.

Through participation in the Wyoming Libraries Database (WYLD), Colorado Alliance of Research Libraries ("Alliance"), the Greater Western Library Alliance (GWLA), OCLC, the National Network of Libraries of Medicine, on-line information retrieval systems, and the interlibrary loan network, access is provided to other library resources from throughout the nation and the world.

The College of Law maintains a separate Law Library.

## Library Faculty:

**SANDRA M. BARSTOW**, B.A. Kalamazoo College 1973; M.L.S. Western Michigan University 1977; M.B.A. Rollins College 1983; Librarian, University Libraries 2004, 1988.

**STEPHEN C. BOSS**, B.M. Simpson College 1983; B.A. 1984; M.L.S. University of Denver 1985; M.A. 1986; Associate Librarian, University Libraries 2008, 2002.

**KAIJSA CALKINS**, B.A. University of Washington, Bothell 2001; M.L.S. University of Washington, Seattle 2004; Associate Librarian, University Libraries 2012, 2006.

**KATE CONERTON**, B.A. University of Wisconsin-Eau Claire 2011; M.L.I.S. University of British Columbia 2013; Assistant Librarian 2013.

**MARY M. FARRELL**, B.A. University of Missouri, Kansas City 1984; M.L.S. University of Arizona 1988; M.P.A. Arizona State University 1992; Dean of Libraries, University Libraries 2002.

**JENNY GARCIA**, B.A. Regis University, 1989; M.L.S. Emporia State University 1992; Associate Librarian, University Libraries 2009, 2003.

**CHERYL GOLDENSTEIN**, B.A. Bethany College 1982; M.L.S. University of Texas at Austin 1997; Associate Librarian, University Libraries 2009, 2002.

**TAMSEN L. HERT**, B.A. Colorado State University 1975; M.L.S. Emporia State University 1984; M.A. 1988; Librarian, University Libraries 2014, 1986.

**CYNTHIA D. HUGHES**, B.A. The College of William and Mary 1994; M.L.I.S. University of Illinois at Urbana-Champaign 1996; Assistant Librarian, University Libraries 2014.

**CHAD E. HUTCHINS**, B.A. University of Colorado, Boulder 1999; M.A. 2001; M.L.I.S. University of Texas, Austin 2004; Associate Librarian, University Libraries 2014, 2008.

**DAVID KRUGER**, B.S. South Dakota State University 1991; B.S.Ed. Minot State University 1994; M.A. Kansas State University 1996; M.L.S. University of Missouri 1998; Associate Librarian, University Libraries 2004, 1998.

**CASSANDRA KVENILD**, B.A. University of Wyoming 1996; M.L.I.S. University of Washington, Seattle 2000; Associate Librarian, University Libraries 2014, 2008.

**DAVID MACAULAY**, B.A. University of New Brunswick 1986; M.A. McGill University 1993; M.L.I.S. 2010; Assistant Librarian, University Libraries 2014.

**JENNIFER MAYER**, B.A. University of Wyoming 1991; M.L.I.S. University of Oklahoma 1996; Associate Librarian, University Libraries 2005, 1999.

**DEBORAH McCARTHY**, B.A. Lycoming College 1983; M.L.S. Texas Women's University 1989; M.B.A. New Mexico State University 2003; Associate Librarian 2009, 2004.

**TAMI MORSE**, B.A. University of California, Davis 1981; M.A. University of California, San Diego 1987; M.L.S. San Jose State University 2001; Associate Librarian, University Libraries 2013, 2006.

**MICHAEL L. NELSON**, B.A. Kalamazoo College 1973; M.Lib. University of Washington 1978; M.A. Montana State University 1980; Associate Librarian, University Libraries 1991, 1984.

**JUDITHE E. PASEK**, B.S. University of Michigan 1977; M.S. University of Missouri 1980; Ph.D. University of Nebraska 1987; M.L.I.S. Wayne State University 2013; Assistant Librarian, University Libraries 2014.

**LORI J. PHILLIPS**, B.A. University of Wyoming 1989; M.L.S. University of Arizona 1991; Associate Librarian, University Libraries 1999, 1992.

**JULIA PROCTOR**, B.A. Western Washington University 2005; M.S. University of Michigan 2009; Assistant Librarian 2012.

**BRYAN RICUPERO**, B.A. Boston University 1996; M.L.I.S. University of Kentucky 2012; Assistant Librarian, University Libraries 2014.

**LAWRENCE SCHMIDT**, B.S. Montana State University 1987; M.S. 1995; M.L.S. Emporia State University 2002; Associate Librarian, University Libraries 2008, 2002.

**LORI J. TERRILL**, B.A. University of Wyoming 1993; M.L.S. Emporia State University 1995; Associate Librarian, University Libraries 2006, 2000.

**SHANNON THARP**, B.A. Drake University 2005; M.F.A. University of Washington, Seattle 2007; M.L.I.S. 2013; Assistant Librarian, University Libraries 2014.

**WILLIAM O. VAN ARSDALE, III**, B.A. Southwestern College-Kansas 1968; M.A. University of Denver 1973; Associate Professor, University Libraries 1987, 1981.

**KELLY VISNAK**, B.A. Metropolitan State College of Denver 1993; M.L.S. Emporia State University Denver 1997; Assistant Librarian, University Libraries 2011.

## Centennial Complex

Designed by internationally prominent architect Antoine Predock to represent both an “archival mountain” and a town at the foot of the mountain, this dramatic building contains the collections of the American Heritage Center and the UW Art Museum. It is located at 2111 Willett Drive, just north of the Arena Auditorium and War Memorial Stadium.

## American Heritage Center

**Mark A. Greene, Director**

**(307) 766-4114**

**Web site:** <http://ahc.uwyo.edu>

The American Heritage Center (AHC) is the university’s repository of manuscripts collections, its rare books library, and its official archives. The Center is one of the largest and most consulted non-governmental repositories in the United States. In 2010 it was recognized as one of the most distinguished archives in the nation when it received the Society of American Archivists’ Distinguished Service Award.

The Center places service to UW undergraduates, graduate students, and faculty as its highest priority. However, because the AHC’s collections are known worldwide, UW undergraduates using the Center’s holdings might be working alongside scholars from Japan or Nigeria or the producers of PBS’s *American Experience*.

The AHC’s collections are of interest to far more than history majors. Each year Center archivists work with students in more than two dozen disciplines at UW: Art, African-American Studies, Agricultural Education, American Indian Studies, American Studies, Anthropology, Botany, Business Administration, Civil Engineering, Creative Writing, Energy Law, Geography and Recreation, History, International Studies, Lab School, English, Music, Nursing, Pharmacy, Political Science, Religious Studies, Secondary Education, Sociology, University Studies, Women’s Studies, Zoology. The AHC also works with a dozen public school classes annually.

- Like most major university repositories, the AHC collects both regionally and nationally in select areas. Major subject concentrations of the 75,000 cubic foot manuscript collections include Wyoming and the American West, the mining and petroleum industries, Western politics and leadership, conservation, journalism, transportation, and 20th century entertainment such as popular music, radio, television, and film.

- The Toppan Library is the University’s rare book center. More than 50,000 items range from medieval illuminated manuscripts to the 21st century. Subject strengths include the American West, British and American literature, early exploration of North America, religion, hunting and fishing, natural history, women authors, and the book arts. Unlike most rare book libraries, it is an active teaching site and welcomes both undergraduates and the public.

The AHC website has earned several national awards. Our digital collections contain 100,000+ photos and historical documents: <http://digitalcollections.uwyo.edu>.

The faculty archivists of the AHC are state, regional, national, and international leaders in their fields, speaking and publishing on historical, archival, and library topics. Several teach national workshops. The Center’s reference archivists are leaders in their profession in undergraduate outreach and instruction. Students and faculty are encouraged to visit and make use of the collections – no appointments are necessary. The American Heritage Center hours are: Reading Room (M, 10am-9pm; Tu-F, 8am-5pm) / Toppan Library (M-F, 8:30am-5pm) / Building (M-F, 8am-5pm).

### American Heritage Center Faculty:

**TYLER G. CLINE**, B.A. Humboldt State University 2009; M.A. Sacramento State 2011; Assistant Archivist 2013.

**RACHAEL DREYER**, B.A. Grinnell College 2004; M.I.S. University of Michigan 2009; Assistant Archivist 2011.

**RICHARD G. EWIG**, B.A. University of Wyoming 1979; M.A. 1980; Associate Archivist 2010, 1994.

**MARK A. GREENE**, B.A. Ripon College 1980; M.A. University of Michigan 1984; Director 2002.

**GINNY KILANDER**, B.A. Indiana University 1992; M.A. University of Wyoming 1998; Associate Archivist 2010, 1999.

**ANNE MARIE LANE**, B.A. University of Missouri 1973; M.A. University of Kansas 1980; M.L.S. University of Arizona 1992; Archivist/Curator of Rare Books 2011, 1995.

**LESLIE C. WAGGENER**, B.A. University of Texas, Austin 1995; M.L.I.S. 2000; Associate Archivist 2012, 2007, 2000.

**D. CLAUDIA THOMPSON**, B.A. Metropolitan State College, Denver 1977; M.A. University of Denver 1978; Archivist 2011, 1995.

**AMANDA STOW**, B.A. Colorado State University 2004; M.L.I.S. University of Denver 2007; Assistant Archivist 2012.

**JOHN WAGGENER**, B.A. University of Wyoming 1994; M.A. 2001; Associate Archivist 2012, 2007, 2000.

## Art Museum

**Susan Moldenhauer, Director & Chief Curator**

**(307) 766-6622**

**Web site:** <http://www.uwyo.edu/artmuseum>

Located on the east side of campus in the award-winning Centennial Complex, the Art Museum was established to “bring the world of art to Wyoming.” As an academic museum and a leader in the arts, the Art Museum collects, preserves, exhibits and interprets visual art from around the world to challenge, inspire and educate the people of Wyoming and beyond, and serves as a gathering place for interdisciplinary discourse, dialogue and community interaction.

The Art Museum’s permanent collection is comprised of over 8,000 objects, which includes European and American paintings, prints, sculpture and drawings as well as special collections of 18th and 19th century Japanese Ukiyo-e prints, 15th through 19th century Persian and Indian miniature paintings, 20th century Haitian art, 20th century Japanese netsuke, 20th century and contemporary photography, and Rapa Nui, Papua New Guinea, African, and Native American artifacts. From 15th century Old Master prints to French Rococo, German Expressionism, Fauvism, Modernism, Surrealism, Abstract Expressionism and Contemporary Art, the collection of paintings, drawings, prints, sculpture, photography, and arts of many cultures and periods, all relate to the development of American art, historically and in all forms.

Exhibitions support the academic mission of the University of Wyoming, provide original resource material for students of all ages, and enhance the cultural life of Wyoming's citizens and visitors. The Art Museum features an average of 15-17 exhibitions annually. Exhibitions rotate generally on a semester schedule, allowing professors to incorporate original artwork into their curriculum and providing access for students to view and use the exhibitions as a resource for original research and scholarship. The schedule typically combines exhibitions curated from the permanent collection, contemporary art by regional, national and international artists, and art from the American West.

Through its Museum as Classroom approach, the University of Wyoming Art Museum places art at the center of learning for all ages, supports the academic mission of the University, assists in preparing our future workforce with essential skills, and enhances the cultural life of Wyoming's citizens and visitors. The Art Museum provides extensive education programs for all ages, including preschool through 12th grade, university students and adults. Using the museum's exhibitions as inspiration, participants create their own art and experience an investigative studio process. Learning from the masters is the museum's key objective and all classes are based on the model of observe, question, explore, create, and reflect. In the spring of 2013, the Art Museum initiated a teaching gallery model in the Guthrie Special Exhibitions Teaching Gallery. Works of art are selected with faculty and the installation is divided into four sections, one exhibition per wall for each class. While the gallery is designed to meet the needs of the academic community, it is also open to the public in order to demonstrate connections between the Art Museum and teaching across the curriculum, supporting UW's academic mission. The Art Museum works with faculty to use the collection as a teaching resource and encourages the opportunity for students to study original artwork. The Art Museum's Resource Room is available for curator led class visits to view artwork from that collection on exhibit in the galleries. Students are also welcome to use the collection and Resource Room for individual research projects and internships.

Art Express, the museum's outreach programs, include the Ann Simpson Artmobile Program and the Touring Exhibition Service, which provide Museum as Classroom opportunities to Wyoming people in even the most remote communities. The Artmobile brings original art and a museum educator to provide programs in schools, community centers, libraries and art and senior centers.. The Artmobile brings original art and a museum educator to Wyoming's communities for programs in schools, community centers, museums, and galleries. The Touring Exhibition Service circulates as many as eight exhibitions of original art to venues across the state and beyond.

The Museum Store offers museum publications (exhibition catalogs and posters), collection notecards and reproduction prints, and unique logo items that include tote bags, t-shirts, and lapel pins.

The Art Museum is free to all and is open Monday through Saturday, 10:00 a.m.–5:00 p.m. Hours are extended to include Mondays until 9 pm in the months of February, March, April, September, October, and November. Additional information on the Art Museum is available on its webpage, [www.uwyo.edu/artmuseum](http://www.uwyo.edu/artmuseum); Facebook (University of Wyoming Art Museum), Instagram (#uwartmuseum) and YouTube (uwartmuseum).

### Art Museum Faculty

**HEATHER BENDER**, B.A. Salisbury State University 1991; Master Teacher 2009.

**WENDY BREDEHOFT**, B.F.A. University of Wyoming 1984; M.F.A. Vermont College 1996; Education Curator/Assistant Research Scientist 2006. Education Curator/Associate Research Scientist 2012.

**NICOLE CRAWFORD**, B.A. University of Nebraska 1997; M.A. 2005; Curator of Collections/Assistant Lecturer 2009.

**RACHEL MILLER**, B.A. University of Wyoming 2007; M.A. University of Denver 2009; Assistant Curator/Assistant Research Scientist 2009.

**SUSAN MOLDENHAUER**, B.F.A. Northern Illinois University 1974; M.F.A. The Pennsylvania State University 1982. Curator of Museum Programs 1991; Assistant Director and Senior Curator 1996; Director and Chief Curator 2002.

**ERICA RAMSEY**, B.F.A., B.A. University of Wyoming 2009; Ann Simpson Artmobile Curator 2013.

### Anthropology Museum

The museum offers exhibits related to the four subfields of anthropology: archaeology, biological, linguistic, and cultural. The main gallery follows the "Human Odyssey," from the evolution of humans in Africa several million years ago to the spread of our species throughout the world, and on to the Late Pleistocene entry into the Americas. The Colby Mammoth Site, the Vore buffalo jump and other Wyoming archaeology sites are featured, with much of the museum devoted to a celebration of the rich Native American heritage of the Plains and Rocky Mountains. Other displays featuring archaeological research and world cultural diversity can be found in hallway displays throughout the building.

The Anthropology Museum is open 8 a.m. to 5 p.m. Monday through Friday during the academic year. During the summer, hours are from 7:30 a.m. to 4:30 p.m. Monday through Friday.

### Division of Information Technology

**Robert Aylward, Vice President for Information Technology**

**IT Center, Room 372, (307) 766-4860**

**Web site: [www.uwyo.edu/InfoTech](http://www.uwyo.edu/InfoTech)**

The Division of Information Technology provides students, faculty and staff with technology infrastructure and support services-computing systems, networking, technical support for systems and applications, computer support, academic and classroom technology support, training, telecommunications services, and research computing support including high performance computing. Use of these University computing and data facilities is governed by UW Regulation 3-690, Ethical Use of Computers and Data Communications Facilities.

The office of the Vice President of the Division of Information Technology is located in room 372 of the Information Technology Center and is open during normal business hours. Those in need of assistance are encouraged to call the Client Support Help Desk at 766-4357, option 1.

**IT's Help Desk:** provides technology support during normal business hours. The fastest way to contact the UWIT Help Desk is to use the Help page at <http://support.uwyo.edu>. Other options to contact the help desk are to email [userhelp@uwyo.edu](mailto:userhelp@uwyo.edu) or call 307-766-HELP (4357), option 1. Help Desk hours are posted at [www.uwyo.edu/InfoTech/services/helpdesk/](http://www.uwyo.edu/InfoTech/services/helpdesk/). Client Support maintains "How To" help documents which cover subjects such as University computer accounts,

how to connect to the network and how to access available software in the computing facilities. A complete listing of available documentation is online at [www.uwyo.edu/AskIT](http://www.uwyo.edu/AskIT).

**IT Service Center and Resnet:** provides help to students, faculty, and staff with personal computers and mobile devices. The Service Center is located in the ITC building room 160 and is typically open Monday – Friday, 9am – 5pm with reduced hours during breaks and the summer months. The Service Center is closed during all University holidays.

One of the primary goals of the Service Center while helping with personal computing devices is to teach customers. Therefore, Information Technology does not allow devices to be dropped off to be repaired. IT requests its customers to take an active role and remain with their device while any repair work is underway.

**Telecom Services:** provides a range of telecommunications services on campus. Data connections, basic phone service, long distance, and Unified Messaging (voice mail) are ordered through the IT Teldesk. Contact Information Technology's Telecom Help Desk in the ITC building, room 377 or call 766-HELP (4357), option 2, for more information.

**Internet and Network Access:** an extensive campus-wide data network provides connectivity to the Internet in most campus buildings, computer labs across campus, and university housing. Wireless Ethernet (Wi-Fi) is available in most campus locations. Students, faculty, and staff should connect to the UWyo wireless network, since it is a faster, more secure connection than UWguest. More information can be found at [www.uwyo.edu/askit](http://www.uwyo.edu/askit) or call the IT Help Desk at 766-HELP (4357), option 1.

**Computer Labs:** are located throughout campus for students, faculty, and staff use. The computers labs contain computers with a wide variety of software and computing equipment. Some labs are staffed by student lab assistants who are able to answer questions. Computer labs in Coe Library and the Information Technology Center are open and staffed 24 hours during the normal academic year. The UWStudent Remote Lab System is a collection of lab machines that are designed to be accessed from off campus networks. The remote lab is configured similar to the UWStudent labs found on campus.

More information, including a link to the UW Student Remote Lab System, a complete listing of labs, lab schedules, and software policies, is available online at [microlab.uwyo.edu](http://microlab.uwyo.edu). For questions and assistance, please e-mail [userhelp@uwyo.edu](mailto:userhelp@uwyo.edu) or call the Help Desk at 766-HELP (4357), option 1.

**Classroom Technology Support (CTS):** provides support and maintenance for audio visual and other technology used in classrooms across campus. For immediate assistance when teaching in a general pool classroom, pick up the phone; the phone will automatically connect to the UW IT Help Desk at the top of the queue. If the issue cannot be resolved over the phone, someone will arrive promptly to provide assistance. Workshops for classroom technologies are available by request. Call 766-2872 for more information. Workshops for all classrooms are also provided by ECTL and CTS at the beginning of each semester. Please go to [www.uwyo.edu/centralscheduling/classroom-building/training.html](http://www.uwyo.edu/centralscheduling/classroom-building/training.html) for further details. Lecture capture technology (Wyocast) is available in several classrooms on campus. For more information on this popular technology please visit <http://www.uwyo.edu/infotech/services/multimedia/wyocast/>

**Data Center Operations (DC Ops):** manages and operates the 6,000 ft<sup>2</sup> University Data Center, located in the Information Technology Center. The Data Center provides a state of the art, highly redundant infrastructure space for university IT equipment. University departments may apply for co-location space in the Data Center to house appropriate production computing equipment. See the ITC Data Center web page ([www.uwyo.edu/InfoTech/aboutit/itc/dc](http://www.uwyo.edu/InfoTech/aboutit/itc/dc)) for more information on co-location, or contact DC Ops at [operate-it@uwyo.edu](mailto:operate-it@uwyo.edu).

**Research Support:** supports high performance computing researchers and computational science. Research Support has installed a mid-range high performance cluster that is available to researchers and students across campus. If you have questions regarding local, regional or national high performance computer, please contact IT research support by email at [arccinfo@uwyo.edu](mailto:arccinfo@uwyo.edu) or call 766-RSIT (7748).

**Computer Maintenance & Sales:** provides repair and general hardware support for PCs, laser printers, and other equipment as well as manufacturer warranty repair support for most Apple, Dell, and Lenovo products. Computer repair requests may be submitted by filling out the web form at [www.uwyo.edu/ITRepair](http://www.uwyo.edu/ITRepair) or by contacting the Help Desk at 766-HELP (4357), option 1. IT Sales provides pre-sale consulting services for a wide range of computer products, specializing in Dell, with consultants located in the ITC who may be contacted at 766-2875 or via e-mail at [itsales@uwyo.edu](mailto:itsales@uwyo.edu). The UW Bookstore is an Apple Authorized Campus Store and takes care of all Apple sales to the campus community.

**Software Sales:** provides Adobe, Microsoft and statistical software to eligible faculty, staff, and students. For more information on available software and prices, please visit <http://www.uwyo.edu/infotech/services/software/>.

## Geological Museum

(307) 766-2646, 2650

E-mail: [uwgeoms@uwyo.edu](mailto:uwgeoms@uwyo.edu)

Web site: [www.uwyo.edu/geomuseum](http://www.uwyo.edu/geomuseum)

The Geological Museum, in the east wing of the S.H. Knight Geology Building, exhibits the story of ancient Wyoming. Highlight exhibits include: one of only six mounted fossil skeletons of the well-known dinosaur *Apatosaurus* (*Brontosaurus*); mounted skeletal cast of the world-renowned "Big Al" the *Allosaurus*; a 50-million-year-old garfish from Wyoming's Green River Formation (one of the largest complete freshwater fossil fish on display in the world); casts of skulls of Wyoming's state dinosaur, *Triceratops*; and its contemporary, *Tyrannosaurus rex*; mounted skeletons of Miocene rhinos and camels; and a fluorescent mineral room, featuring specimens from Wyoming and the world. The museum maintains important display collections (particularly vertebrate and invertebrate fossils) that are available for study by students, as well as scientists from other institutions. The museum provides unique opportunities for undergraduate students to pursue research and display projects in Wyoming paleontology.

## **William D. Ruckelshaus Institute of Environment and Natural Resources**

**Nicole Korfanta, Director**

**Bim Kendall House**

**804 E. Fremont St.**

**Laramie, Wyoming 82072**

**Phone: (307) 766-5080, Fax: (307) 766-5099**

**Email: ruckelshaus@uwyo.edu**

**Web site: [www.uwyo.edu/haub/ruckelshaus-institute](http://www.uwyo.edu/haub/ruckelshaus-institute)**

The William D. Ruckelshaus Institute is housed within the Haub School of Environment and Natural Resources at the University of Wyoming. The Ruckelshaus Institute conducts policy analysis and research, offers resources and facilitation to support collaborative decision making, and provides outreach for natural resource professionals and the public.

**Research and Policy Analysis:** Through proactive initiatives and by invitation, the Ruckelshaus Institute produces neutral scientific, technical, and socioeconomic analysis on natural resource issues important to Wyoming and the West. Since 1994, the Institute has made information available on topics as diverse as land use, wildlife, water, energy-environment linkages, and environmental policy.

**Collaborative Solutions:** The Ruckelshaus Institute supports inclusive and collaborative approaches to environmental conflict resolution by facilitating and convening collaborative processes, offering trainings in mediation and collaborative decision making for natural resource professionals, and teaching courses in negotiation theory for UW students.

**Outreach:** The Ruckelshaus Institute makes research available to stakeholders through accessible publications and by convening conferences on critical natural resource issues. Our Wyoming Open Spaces Initiative, Energy Mitigation Research and Outreach Initiative, and other publications serve a range of environmental and natural resource stakeholders including policy makers, government agencies, non-profits, industry, and the public.

## **Biodiversity Institute**

**Carlos Martinez del Rio, Director**

**Berry Biodiversity Conservation Center, Room 231**

**Phone: (307) 766-6240**

**Email: [biodiversity@uwyo.edu](mailto:biodiversity@uwyo.edu)**

**Web site: [www.uwyo.edu/biodiversity](http://www.uwyo.edu/biodiversity)**

The University of Wyoming's Biodiversity Institute, established in 2012, promotes research, education, and public engagement around biological diversity in all its forms and on all scales. The institute is a center where scholars and the public convene to expand understanding of biodiversity science and to explore the interplay between human society and the natural world.

The Biodiversity Institute is a division of the Haub School of Environment and Natural Resources, whose academic programs and institutes advance the understanding and resolution of complex environmental and natural resource challenges. The Biodiversity Institute fosters conservation of biodiversity by enabling all citizens to participate in scientific discovery.

The goals of the Biodiversity Institute are three-fold: to support research in biodiversity science and its impacts on the environment and society; to provide opportunities for the education of students in the scientific and social aspects of biodiversity; and to engage the public in essential discussions of the value of biological diversity and the consequences of its loss.

Projects include providing grants for biodiversity research and natural history collections support, studying the Berry Center's green roof as a model for sustainable technology, developing a biodiversity curriculum for the University of Wyoming, publishing a biodiversity atlas series, and building a web portal for citizen biodiversity science in Wyoming, among others.

The Biodiversity Institute also organizes and hosts events including concert series, biodiversity films, art exhibits, expeditions, and speakers.

## **Wyoming Geographic Information Science Center**

**Jeff Hamerlinck, Director**

**Agriculture C, Room 337 (307) 766-2532**

**E-mail: [wygisc@uwyo.edu](mailto:wygisc@uwyo.edu)**

**Web site: [www.uwyo.edu/wygisc](http://www.uwyo.edu/wygisc)**

The Wyoming Geographic Information Science Center (WyGIS) has a mission to advance the understanding and application of geographic information science through basic and applied research, education and training, information and technology transfer, and by promoting utilization of geospatial technologies for science, management, and decision making within the University and throughout the state and region. Examples of geospatial technologies include geographic information systems, geographic cartography and visualization, Global Positioning System-based mapping, and image processing of remotely-sensed Earth resource data derived from aircraft or satellites. Broad applications areas exist in both environmental and social sciences, as well as agriculture, engineering and business.

Established in 2001, WyGIS operates under the Office of Academic Affairs and in close coordination with the Office of Research, providing assistance to all units on campus and to numerous private, local, state, and federal entities in Wyoming and the Rocky Mountain region. Services include research collaboration, technical expertise, geospatial technology short course training, and geospatial data dissemination.

WyGIS encourages undergraduate and graduate student participation in its research projects and has sponsored students from the McNair Scholars Program and other student research apprentice programs, as well as graduate students affiliated with participating departments and research centers. Part-time employment and internship opportunities are often available. Inquiries may be directed to the center using the contact information provided above.

## Statistical Consulting Center

Ken Gerow, Director

337 Ross Hall, (307) 766-6600

The Statistical Consulting Center, a unit of the Department of Statistics, exists to coordinate the statistical knowledge and skills available within the department with the subject-matter expertise of other scientists throughout the university, and to bring that combination to bear on applied research problems in diverse areas. The center can provide assistance in research design, sampling, data collection, and/or data analysis for the full range of research needs. The initial consultation is free. Thereafter, a variety of mechanisms are available to acknowledge the contributions of statistical consulting to a given research project, including co-authorship on a scholarly publication, membership on a thesis or dissertation committee, direct compensation to the consultant at private consulting rates, subcontracting with the center on a grant project, etc. On occasion, the center can also offer paid employment and internships to graduate students who have appropriate training and skills to assist other researchers. For further information about any of the services available through the Statistical Consulting Center, please contact the center via the contact information above.

## Wyoming Survey & Analysis Center

Stephen Bieber, Director

UW Office Annex, Second Floor

Dept. 3925; 1000 E. University Ave.

Laramie, Wyoming 82071

Phone: (307) 766-2189, Fax: (307)766-2759

Email: [wysac@uwyo.edu](mailto:wysac@uwyo.edu)

Web site: <http://wysac.uwyo.edu>

The Wyoming Survey & Analysis Center (WYSAC) provides information for decision-makers by collecting, managing and analyzing data. WYSAC acts as a nucleus to the University for applied research, policy analysis, needs assessment and evaluation studies, with special emphasis on topics related to education, the environment, criminal justice and substance abuse. WYSAC personnel provide assistance to the academic community, University administrative units and both the public and private sectors throughout Wyoming and the region. Interested parties can call upon the center's expertise in survey methods, evaluation research, and information technology to carry out their data collection and analysis on a contract basis.

Services include opinion polling, drawing and construction of samples, design of questionnaires, computer data recording, tabulation of data, policy analysis and software development. A computer-assisted telephone interviewing system (CATI) is maintained in the center for use by trained interviewers. The center has staff knowledgeable in current US postal regulations for mail surveys, along with hardware and software for scanning the returns. Surveys are also conducted by e-mail, on the Internet, through in-person interviewing and in focus groups. The center offers paid employment and internships to students assisting in such tasks.

For further information on WYSAC or if interested in a graduate assistantship with WYSAC, contact WYSAC via the contact information provided.

## UW National Park Service Research Center

(307) 766-4227

Web site: [www.uwyo.edu/uwnps](http://www.uwyo.edu/uwnps)

The research center operates in a field station at the historic AMK Ranch in Grand Teton National Park, located 65 km north of Jackson, Wyoming. The field station provides scientists abundant research opportunities in the diverse terrestrial and aquatic environments of Grand Teton and Yellowstone National Parks as well as the surrounding National Forests and Wilderness areas that make up the entire Greater Yellowstone area (GYA). The station has housing for up to 60 researchers and provides terrestrial and aquatic laboratories, boats, field equipment, conference rooms, internet service and a library, all on site. A small grants program provides funding yearly for individual proposals up to \$5,000 as well as scholarship and intern funding for projects conducted in the GYA. Field courses and conference are accommodated in the spring and fall seasons. A weekly seminar series with a barbecue dinner is presented throughout the summer.

Inquiries concerning the UW-NPS Research Center program should be addressed to: Director, University of Wyoming-National Park Service Research Center, Dept. 3166, 1000 E. University Ave., Laramie, WY 82071 or emailed to [chavener@uwyo.edu](mailto:chavener@uwyo.edu).

## Red Buttes Environmental Biology Laboratory

Within a few miles of Laramie, the Department of Zoology and Physiology operates the Red Buttes Environmental Biology Laboratory, a 9,600-square-foot facility equipped to handle both aquatic and terrestrial vertebrates. An aquatic ecology and toxicology laboratory, uniquely designed to accommodate a wide range of test conditions of water flow, temperature and composition, is available within the facility. Animal holding and surgical rooms are specifically constructed to accommodate experimentation on small (e.g. mice, squirrels), medium (e.g. coyote, badger) and large (e.g. elk, bighorn sheep) mammals. Outdoor corrals and fish runs are also available on the 400-acre site.

Inquiries concerning the Red Buttes Environmental Biology Laboratory should be addressed to the Department Head, Department of Zoology and Physiology, Dept. 3166, 1000 E. University Ave., Laramie, WY 82071.

## Rocky Mountain Herbarium

Located in the Aven Nelson Building, the Rocky Mountain Herbarium and the associated U.S. Forest Service National Herbarium contain more than 1,250,000 plant specimens. The primary functions of the herbarium are to (1) serve as a source of information on the flora of the Rocky Mountain region in general and Wyoming in particular; (2) aid in the identification of plants submitted by ranchers, farmers, county agents, and state and federal agencies throughout the region; and (3) serve as a source of research and teaching material in systematic and ecological botany. Thousands of specimens are loaned each year to recognized institutions throughout the United States where research requires a knowledge of western plants. The web site ([www.rmh.uwyo.edu](http://www.rmh.uwyo.edu)) contains data on more than 700,000 specimens as well as thousands of specimen images and interactive distribution maps.

Open to university students and other qualified researchers, the herbarium invites queries regarding the identification of plants. Those persons wishing assistance in the identification of a plant should send two specimens to the herbarium. Inquiries should be addressed to The Curator, Rocky Mountain Herbarium, Department of Botany, Dept. 3165, 1000 E. University Ave., Laramie, WY 82071.

## Western Interstate Commission for Higher Education (WICHE)

The Western Interstate Commission for Higher Education (WICHE) was created in 1953 by the governors and legislators of the western states. The primary commitment is to provide access to educational programs through interstate cooperation. Wyoming provides opportunities for qualified residents in the following programs:

*Professional Student Exchange Program (PSEP)* offers certified Wyoming residents access to professional education in the fields of dentistry, medicine, occupational therapy, optometry, osteopathic medicine, physical therapy, physician's assistant, podiatry, and veterinary medicine. To be eligible for certification, the applicant must be a legal resident of the State of Wyoming for one year immediately prior to enrolling in professional school. Applications for certification are located at [www.uwyo.edu/hs/wiche-wwami-wyident-program/index.html](http://www.uwyo.edu/hs/wiche-wwami-wyident-program/index.html) and are due no later than October 15 of the year preceding the anticipated start date of professional school. Applicants who are accepted to a professional program and who receive state support pay reduced tuition. In all fields except veterinary medicine, students receiving state support must either pay back the money expended on their behalf, or practice in their fields in the state of Wyoming for three years. State support is dependent on continued appropriations from the Wyoming State Legislature.

*Western Regional Graduate Program (WRGP)*: provides opportunities for qualified Wyoming residents to attend distinctive or health-related graduate programs in participating WICHE states and territories. Those accepted pay resident or significantly reduced tuition at the school they attend.

*Western Undergraduate Exchange (WUE)*: allows residents of participating states and territories to attend a participating institution at reduced cost of 150% of the institution's resident tuition. Not all institutions in the participating states offer WUE opportunities.

The University of Wyoming invites competitive applicants from participating states and territories and awards WUE to highly qualified students. Information can be obtained from the UW Admissions Office.

Information about WICHE programs may be obtained from the WICHE Certifying Office; Dept. 3432, 1000 E. University Ave.; Laramie, WY 82071; (307)766-6704 or (307)766-3499 or [cutoff@uwyo.edu](mailto:cutoff@uwyo.edu) or WICHE Student Exchange Program, 3035 Center Green Drive, Suite 200; Boulder, CO 80301-2204, (303) 541-0214.

## Wilhelm G. Solheim Mycological Herbarium

The Wilhelm G. Solheim Mycological Herbarium, housed on the third floor of the Aven Nelson Building, facilitates the study of symbiotic and biotrophic fungi. The herbarium contains approximately 50,000 specimens of fungi from around the world and the largest collection of fungi in the Rocky Mountain Region. These collections are available for study by qualified students and researchers. Specimens may be borrowed by institutions without charge for a one-year period. Inquiries should be addressed to The Curator, Solheim Mycological Herbarium, Department of Botany, Dept. 3165, 1000 E. University Ave., Laramie, WY 82071.

## Wyoming Cooperative Fish and Wildlife Research Unit

(307) 766-5415

Web site: [www.wyocoopunit.org](http://www.wyocoopunit.org)

Email: [wyo-coop@uwyo.edu](mailto:wyo-coop@uwyo.edu)

[www.coopunits.org/Wyoming](http://www.coopunits.org/Wyoming)

The Wyoming Cooperative Fish and Wildlife Research Unit is supported by the University of Wyoming, the Wyoming Game and Fish Department, the U.S. Geological Survey and the Wildlife Management Institute. The three permanent unit staff members serve as full faculty in the Department of Zoology and Physiology.

The Unit conducts research on many types of fish and wildlife issues. A primary emphasis is on evaluating the ecology and management of fish and wildlife in the northern Rocky Mountain region. Much of the Wyoming Game and Fish Department's field research is conducted through the Unit. Both students hired as technicians as well as graduate assistants are involved in Unit research. Additional details of the Unit's research program can be found at [www.wyocoopunit.org](http://www.wyocoopunit.org).

For further information contact the Wyoming Cooperative Research Unit, Dept. 3166, 1000 E. University Ave., Laramie, WY 82071, or [wyo-coop@uwyo.edu](mailto:wyo-coop@uwyo.edu).

## Study Abroad/Exchange

(307) 766-6681

E-mail: [studyabd@uwyo.edu](mailto:studyabd@uwyo.edu)

Web site: [www.uwyo.edu/studyabroad/](http://www.uwyo.edu/studyabroad/)

Study abroad and student international exchange opportunities are available through the International Programs Office, located on the first floor of the Cheney International Center. UW students with a minimum 2.75 GPA are eligible to apply to participate in a wide variety of for-credit programs of study outside the U.S. Some work and internship options may be available. The exchange/study abroad staff works with students individually to tailor the program of study to their specific needs. Considerations are made for cost, financial aid opportunities, transfer of credit, safety and health, time-to-graduation, country or region desired, and optional foreign language requirements.

In addition to perfecting foreign language skills (in non-English-speaking countries) and learning about another culture in depth, international education makes for a life-changing experience. It alters perspectives by developing flexibility and critical thinking. International education also engenders a sense of what it is to be an American, what it is to be a citizen of the world, and who we are individually. Study abroad and exchange can help clarify life and professional goals, and often develops greater direction, focus, and motivation for the remaining years of university life, and beyond.

Through a combination of foreign partner universities, study abroad consortia, and cooperating U.S. universities, UW provides study abroad opportunities at hundreds of locations across the globe. Exchange opportunities also exist – they represent programs where students at partner institutions pay their home university tuition and fees, then simply exchange places. As another path to an international experience, self-designed programs of study with non-partner entities can be arranged as well.



**Commonly Held Misconceptions about Study Abroad**

Myth 1: I can't afford to study abroad.

Fact: There are many programs available that cost the same or nearly the same as attending UW.

Myth 2: I can't use my financial aid to study abroad.

Fact: Financial aid can be used for study abroad. There are also scholarships available to offset additional costs of study. Cheney Grants and Fellowships are unique to qualified, full-time students who study abroad from UW.

Myth 3: I can't study abroad for less than a semester.

Fact: There are many short courses led by UW faculty for a shorter period of time during the winter break, or spring break, as well as recommended field courses with a study abroad component offered in the summer session.

Myth 4: Because I speak English only, I am limited to English-speaking countries for study abroad.

Fact: There are a great many programs abroad for English speakers in non-English speaking countries. In order to attract U.S. students, many foreign universities offer courses in English.

Myth 5: I can't graduate on time if I study abroad.

Fact: Study Abroad advisers work with you and your academic adviser to select a place of study that offers the courses you require to complete your degree on time.

Myth 6: My adviser doesn't recommend study abroad.

Advice: Speak with your department chair and/or dean about this. Your adviser may subscribe to the study abroad myths outlined here. Don't be swayed by them.

Myth 7: There is nowhere abroad I can complete courses in my major.

Fact: UW offers hundreds of study abroad sites overseas. There are programs for every major.

Myth 8: It is dangerous to live abroad.

Fact: Study overseas is no more or less dangerous than it is in the U.S. UW carefully selects and monitors our students' study locations. Just exercise the same precautions you do at home, when visiting a U.S. city, and when walking at night.

Myth 9: Study abroad is not important.

Fact: Only 3% of U.S. undergraduates study abroad during college. The U.S. needs its citizens to be internationally competent so that the nation can secure itself and its economic future in the 21st century, and employers value the skills that come from study abroad.

For further information, contact International Programs at the phone number or e-mail above, or by writing to Study Abroad and Exchange, Department 3707, 1000 E. University Ave., Laramie, WY 82071.

**Wyoming State Veterinary Laboratory**

1174 Snowy Range Road, (307) 766-9925

E-mail: [vetrec@uwyo.edu](mailto:vetrec@uwyo.edu)

Web site: [wyovet.uwyo.edu](http://wyovet.uwyo.edu)

Located west of campus and operated by the Department of Veterinary Sciences, the Wyoming State Veterinary Laboratory (WSVL) is responsible for diagnosis and reporting of animal diseases. Areas of expertise include morphological and clinical pathology, bacteriology, virology, toxicology, parasitology, electron microscopy, molecular diagnostics, and serology.

Cooperative diagnostic and research activities are conducted with various state and federal agencies. The WSVL building also houses a UW classroom, laboratories for the Wyoming Game and Fish Department, and Wyoming Department of Agriculture Analytical Services Laboratory. Students are encouraged to conduct domestic and wildlife disease research in an interdisciplinary setting.

For further information contact WSVL, 1174 Snowy Range Road, Laramie, WY 82070.

# Commonly Used Terms

**Academic load:** The total semester hours of credit for all courses taken during a specified time—semester or summer session.

**Academic probation:** Probation is the status of an undergraduate student who is not progressing satisfactorily toward his or her degree. An undergraduate student shall be placed on probation at the end of the semester or term when his or her cumulative grade point average (GPA) falls below a 2.0; 3.0 for graduate students.

**Academic reinstatement:** Restoration of a student's eligibility to register for courses after being on academic suspension. This process requires a petition that is first reviewed by the dean of the student's college or the Center for Advising and Career Services. Academic reinstatement does not guarantee restoration of financial aid eligibility which is a separate process handled by the financial aid office.

**Academic suspension:** The status of a person whose enrollment at UW has been terminated because of unsatisfactory academic progress towards either an undergraduate or graduate degree.

**Accredited:** A term applied to a school or specific program which has been recognized by a national or regional organization as meeting certain academic standards for quality and educational environment. The University of Wyoming, and all UW academic programs are accredited by the Higher Learning Commission of the North Central Association of Colleges and Schools Commission on Institutions of Higher Education. This is the highest level of accreditation in the United States. Some academic programs have professional standards established by their respective accrediting associations.

**Add and drop deadlines:** The latest date in an academic term when a course may be added or dropped from a student's class schedule *without* approval of someone other than the student. Adding and dropping of courses is done through WyoRecords.

**Admission:** The process of being admitted to the university with the opportunity to take classes.

**AP exam:** An Advanced Placement Examination from the College Entrance Examination Board (CEEB) in a specific subject area available nationally to high school students. Obtain information on taking the examination from a high school guidance counselor. Information on university course credit for these examinations is available from the Office of the Registrar.

**Audit:** Individuals who want to take a course but who do not want either a grade or credit for taking it may register as an audit. The instructor for the course determines the amount of work and/or participation that is required. Marks of either Audit/Satisfactory or Audit/Unsatisfactory are assigned. Audit hours are charged tuition at the normal rate. Audit hours are not used to determine full- or part-time status.

**Banner:** Banner is a suite of products that are used as our student information system.

**Class schedule:** A publication containing a listing of all courses scheduled to be offered during a specific semester or summer session. *Class Schedules* are available on the Web.

**CLEP test:** Subject area examination administered by the College Entrance Examination Board.

**Concentration:** A collection of courses within a major which focuses on a particular subject area.

**Continuing probation:** A student is placed on academic probation at the end of the semester or term when his or her cumulative grade point average (GPA) falls below a 2.0. A student is considered on continuing probation in subsequent semesters if the student earns a term GPA of 2.0 or above but whose cumulative GPA is still below a 2.0.

**Corequisite:** A course to be taken or a requirement to be fulfilled at the same time as a particular course is being taken.

**Cross-listed course:** A course which is identical in content, title, credit hours, and requirements which is offered by one or more academic departments. The four-digit course number must be the same. This designation must be approved by the University Course Review Committee.

**Curriculum:** The set of courses in a particular degree program. More generally, the courses (in total) offered in a college or university.

**Degree requirements:** Degree requirements include all requirements of the university (including University Studies Program), college, academic department, and major. All requirements must be successfully met in order to obtain a specific degree.

**Drop:** To discontinue enrollment in a course or courses prior to the end of the drop/add period at the beginning of a term. A dropped course does not appear on the student's academic transcript. Dropping from a class does not influence a student's Satisfactory Academic Progress measurement, but may impact the amount of financial aid a student earns for the semester in question.

**Dual-listed course:** A course which is offered at both the 4000- and 5000-level that is identical in course prefix, content, title, and credit hours. The last three digits of the four-digit course number must be the same. The 5000-level course must require additional work beyond that required for the 4000-level course. This designation must be approved by the University Course Review Committee.

**Financial aid reinstatement:** Restoration of one's financial aid eligibility based on being granted an exception to financial aid or scholarship rules. Financial aid restoration is a separate process from and is not guaranteed by academic reinstatement.

**Full-time:** A student taking 12 or more credit hours at the undergraduate level or 9 or more credit hours at the graduate level is considered a full-time student. During the summer session, undergraduate students enrolled in 6 or more credit hours and graduate students enrolled in 4.5 or more credit hours are considered full-time.

**Grade point average:** The semester grade point average (GPA) is the sum of all grade points earned in a semester or term divided by all credit hours attempted for letter grade. Credit hours in courses in which marks of I, W, S, or U were assigned are excluded. The cumulative grade point average is the average of all grades earned at UW.

**Lower-division course:** Courses normally taken during the freshman and sophomore years. Lower division courses are those numbered between 1000 and 2999.

**Major:** The primary disciplinary interest or academic subject area of a student as represented by one of the curricula offered by the various academic departments. The undergraduate degree may or may not carry the same title as the major. Every student has one or more majors but may or may not have a minor or concentration.

**Minor:** A secondary subject area interest (to the major) represented by a specified set of hours and/or courses. Differs from a concentration in that a minor is not a subdivision of the major subject area.

**Option:** A concentration of elective courses within a major which emphasizes one aspect of the major, chosen by a student according to his or her interests.

**Orientation:** A program of one to three days on campus designed to acquaint a new student with the facilities, policies, sources of information and assistance, and academic and social environment. Academic advising and registration are also included.

**Prerequisite:** A requirement to be completed before enrollment in a course or a degree program. Prerequisites for individual courses are listed in their course description in this catalog. The statement, “or consent of instructor” is implied for all prerequisites. Students are responsible for being aware of a course’s prerequisites prior to enrolling in the course.

**Registration:** The process of officially enrolling into one or more courses or matriculation at the university.

**Satisfactory academic progress:** Satisfactory Academic Progress only applies to federal financial aid applicants and recipients. Three measures of a student’s advancement toward the earning of his or her stated degree objective are 1) a grade point average putting the student in good academic standing, 2) a ratio of credit hours earned compared to credit hours attempted in the student’s most recent academic year, and 3) a comparison of the number of credit hours attempted in a college career compared to the number of hours required to earn the pursued degree.

**Semester:** The division of the calendar year used in academic scheduling. A semester is roughly 15 weeks in length.

**Semester credit hour:** The unit of academic credit for course work.

**Transfer credit evaluations:** An evaluation of previous college-level course work from another regionally-accredited academic institution, international post-secondary institution, standardized test, or military course work to determine whether courses are transferable to UW as well as to determine any UW equivalents.

**University Catalog:** The *University Catalog*, is the official document of the university which includes information on all undergraduate academic programs and their requirements, courses offered by each academic department, lists of faculty, policies and procedures related to admission, financial aid, all registration activity, and tuition and fees. A student’s degree requirements are based on the *University Catalog* in effect the year he or she enters either UW or another catalog year as approved with a petition.

**Upper-division course:** Courses normally taken during the junior and senior years. These courses are numbered from 3000 – 4999.

**“W” Number:** A student’s unique identifier in the Banner/WyoRecords system will begin with “W”. This “W” number replaces the Social Security Number as a student’s unique identifier.

**Withdrawal:** To discontinue enrollment in a course or courses after the end of the drop/add period. When withdrawing from one or more, but not all, courses, a student should complete the process on WyoRecords. To withdraw from all courses in a semester, a student should begin the process in the Dean of Students Office. A mark of W will be placed on the student’s academic transcript for each course. Withdrawal from a course or from the university may impact both a student’s current and future receipt of financial aid. Ask a financial aid office professional before withdrawal.

**WyoRecords:** The University of Wyoming portal used for communication with the campus community, registration activity, grade posting, financial aid, course management, and advising. A specialized version of WyoRecords is available for all enrolled students, faculty, staff, and alumni.

# Courses of Instruction

## Changes in Catalog Information

The course offerings and requirements of the University of Wyoming are under examination and revision continually. This catalog is not a contract; it merely presents the offerings and requirements in effect at the time of publication and in no way guarantees that the offerings and requirements will not change.

Not all courses are offered each term. The listing of courses does not imply a contractual obligation to offer the same during the year of publication of this catalog. The university reserves the right to offer, limit, or cancel course offerings for academic, funding, or facility considerations, and to cancel any offered course for which there is not sufficient enrollment.

The university reserves the right to change approved course listings at any time during a student's term of residence.

## Preparatory Courses Taught at UW by Laramie County Community College

The University of Wyoming has contracted for Laramie County Community College to offer preparatory courses on the university campus. University students will register through the normal university registration process. Inclusion of these courses in a student's schedule will count as part of the credit load for determining full-time status; however, UW credit is not awarded. For further information, contact the LCCC coordinator, Ross Hall, rooms 26 and 27, (307) 766-2514.

## Course Credits

The amount of credit offered for any course work published in this catalog is based on and governed by prior university faculty recommendation and institutional determinations.

A credit hour denotes a unit of academic work. Normally, one credit hour is earned in a course meeting one hour per week for a semester (15-16 weeks). Each credit hour unit requires an average of three hours of student effort per week. In variable credit courses, the efforts required of the students are proportional to the credit hours attempted.

Even if topics differ in separate sections, variable credits limit the credits which can be earned in that course in one semester and career maximum limit the credits from that course considered toward any one degree.

## Format of Course Listings

On the following pages, courses approved for offering are listed by college, program subject, and course level (number).

The heading which precedes the brief description of each course shows the current course identification number; former course number(s), if any, in brackets; course title; a designation in bold brackets ([QB◀▶Q], e.g. [USP 2003◀▶USP 2015]), if any, concerning applicability of the course to the University Studies Program (see below for designation); an indicator, if any, concerning applicability of the course in postgraduate-careers; the number of semester credit hours established for the course (fixed or variable with the semester); and the career maximum of credit for successive term enrollments in the identified

course, if different from the established semester credit-hours limit. For example, "1-3 (Max.9)" means that a student may earn between 1 and 3 hours of credit for that course within one semester and a maximum of 9 hours within a degree career. The course description indicates any prerequisites for that course and if it is offered for satisfactory/unsatisfactory grading only.

## Course Levels

University courses are distinguished by number indicating five levels of instruction as follows:

- 0000-0999 Preparatory courses (no credit)
- 1000-2999 Primarily for Freshmen and Sophomores
- 3000-4999 Primarily for Juniors and Seniors
- 5000-5999 Primarily for Graduate Students
- 6000-6999 Law courses, WWAMI courses, and Doctor of Pharmacy courses

A bracketed course number [ ] indicates a previous number of the same course. Double credit cannot be earned by repeating a course.

Prerequisites are the primary factor which normally govern whether a student enrolls for any particular course. However, individual departments and/or colleges may place additional restrictions on course enrollments (e.g. enrollment may be restricted by student classification).

Enrollment in engineering courses is generally limited to engineering students.

Law courses are normally open only to students approved for the program.

Graduate students may enroll in courses numbered 1000-3999 to satisfy undergraduate deficiencies but only courses numbered 4000 and above will be computed into the graduate GPA and allowed for graduate credit.

## University Studies Program Designations\*

- C1 = Communication 1
- C2 = Communication 2
- C3 = Communication 3
- FY = First-Year Seminar
- H = Human Culture
- PN = Physical and Natural World
- Q = Quantitative Reasoning
- V = U.S. and Wyoming Constitutions

\*Please note: Throughout the department pages and course descriptions in this catalog, a few of the USP 2015 designations will appear as such: C1 = COM1; C2 = COM2; C3 = COM3; FY = FYS.

# Course Prefixes and Description Index

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ATSC	Atmospheric science	419	HIST	History	244
BE	Bioengineering	459	HLED	Health education	485
BMS	Biomedical Science	520	HLSC	Health sciences	469
BOT	Botany	183	HM	Human medicine	489
BUSN	Business	345	HP	Honors program	560
CE	Civil engineering	434	IMGT	Information management	348
CHE	Chemical engineering	424	INBU	International business	359
CHEM	Chemistry	188	INST	International studies	239
CHIN	Chinese	259	ITEC	Instructional technology	403
CHST	Latina/o studies	267	JAPN	Japanese	263
CLAS	Classics	258	KIN	Kinesiology	479
COJO	Communication and journalism	194	LANG	Languages	263
CNSL	Counseling	391	LATN	Latin	263
COSC	Computer science	448	LAW	Law	532
CRMJ	Criminal justice	201	LBRY	Information Literacy	551
DHYG	Dental hygiene	470	LIBS	Library sciences	405
DSCI	Decision science	357	LIFE	Life Science	269
ECOL	Ecology	522	LS	Land Surveying	442
ECON	Economics	352	LTED	Literacy Education	383
EDAD	Educational administration	399	MATH	Mathematics	273
EDAG	Agricultural education	411	MBAM	Master of Business Administration	365
EDCI	Curriculum and instruction	379	MBAX	Online Master of Business Administration	366
EDEC	Early childhood education	388	ME	Mechanical engineering	463
EDEL	Elementary education	387	MGT	Management	360
EDEX	Exceptional children	407	MICR	Microbiology	134
EDRE	Educational Research	401	MKT	Marketing	362
EDSE	Secondary education	410	MLSK	Medical laboratory science	512
EDST	Educational studies	385	MOLB	Molecular biology	138
EE	Electrical engineering	456	MUSC	Music	283
EMAT	Mathematics Education	383	NASC	Natural science	413
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<b>Prefix</b>	<b>Department</b>	<b>Page</b>	<b>Prefix</b>	<b>Department</b>	<b>Page</b>
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PEAC	Physical education - activity	479	RUSS	Russian	264
PEAT	Varsity Athletics	479	SOC	Sociology	319
PETE	Petroleum engineering	428	SOIL	Soil sciences	120
PHCY	Pharmacy	506	SOWK	Social work	515
PHIL	Philosophy	291	SPAN	Spanish	265
PHYS	Physics	297	SPPA	Speech language pathology	474
PLNT	Plant sciences	144	STAT	Statistics	324
POLS	Political science	301	THEA	Theatre and dance	331
PRST	Professional Studies	409	UWYO	University of Wyoming DSP	562
PSYC	Psychology	309	WIND	Wyoming Institute for Disabilities	519
RELI	Religious studies	315	WMST	Women's studies	212
REWM	Rangeland ecology and watershed management	117	ZOO	Zoology and physiology	338

# College of Agriculture and Natural Resources

151 Agriculture Building

Frank Galey, Dean

Phone: (307)766-4133 Fax: (307)766-4030

Web site: [www.uwyo.edu/uwag](http://www.uwyo.edu/uwag)

The College of Agriculture and Natural Resources offers a wide variety of course work in agriculture, natural resources, molecular biology, and family and consumer sciences. The curriculum provides a sound background in basic sciences and the choice of a number of fields in which to specialize. Students are trained in principles which apply throughout the world, with special emphasis on agriculture and natural resources found in the Rocky Mountain region.

Laboratory work is stressed in all programs because of its importance in agricultural and natural resource professions. Students receive excellent training from case studies and practical experience provided at research and extension centers. Other facilities include modern laboratories and classrooms, an abattoir, meat processing rooms, farm shop, greenhouses, and wool laboratory.

In addition to the academic departments, the college includes the Agricultural Experiment Station and the Cooperative Extension Service. Materials and techniques resulting from this effective triple combination benefit both students and staff in the never-ending search for problem-solving information. The close relationship between teachers, researchers, and extension workers creates a learning atmosphere that encourages the development of the finest students.

## Programs of Study Undergraduate Degrees

### Bachelor of Science

- Agricultural business
- Agricultural communications
- Agroecology
- Animal and veterinary sciences
- Microbiology
- Molecular biology
- Rangeland ecology and watershed management

### Bachelor of Science in Family and Consumer Sciences

### Bachelor of Applied Science

- Organizational leadership

## Graduate Degrees

### Master of Arts

- Molecular biology

### Master of Science

- Agricultural and applied economics
- Agricultural economics/water resources
- Agronomy
- Animal and veterinary sciences
- Entomology
- Entomology/water resources
- Family and consumer sciences
- Family and consumer sciences/  
Early childhood development
- Food science and human nutrition
- Molecular biology
- Rangeland ecology and watershed management
- Rangeland ecology and watershed management/water resources
- Reproductive biology
- Soil science
- Soil science/water resources

### Doctor of Philosophy

- Agronomy
- Animal and veterinary science
- Entomology
- Molecular and cellular life sciences
- Molecular biology
- Rangeland ecology and watershed management
- Reproductive biology
- Soil science

The following certificates and/or degrees in the College of Agriculture and Natural Resources are available through the UW Outreach School:

- Certificate: Early Childhood Program Director
- Bachelor of Applied Science
- Online bachelor's degrees: Family and Consumer Sciences (Professional Child Development or Family and Community Services Options)

For more information, contact the UW Outreach School at (800) 448-7801 or go to the web at [outreach.uwyo.edu](http://outreach.uwyo.edu).

The College of Agriculture and Natural Resources also offers a graduate certificate in reclamation and restoration ecology. For more information, contact the Department of Ecosystem Science and Management.

## Basic Education Core

All undergraduates in College of Agriculture and Natural Resources curriculums are required to follow the basic education core as noted below.

Core Components (USP 2015)	Hrs.
First-Year Seminar (FYS).....	3
Quantitative Reasoning (Q).....	3
Communication 1 (COM1).....	3
Communication 2 (COM2).....	3
Communication 3 (COM3).....	3
Human Culture (H).....	6
Physical & Natural World (PN).....	6
U.S. and Wyoming Constitutions (V).....	3
Subtotal (min. core requirements).....	30
Hours for major, support areas and electives as determined by division... 90-98	
<b>Total Hours</b>	<b>120-128</b>

Core Components (USP 2003)	Hrs.
Intellectual Community (I).....	1-3
Writing 1 (WA).....	3
Oral Communication (O).....	3
Quantitative Reasoning 1 (QA)*.....	3
Quantitative Reasoning 2 (QB).....	3
Science (S, SB, SP, SE).....	4-8
Cultural Context (C, CH, CS, CA).....	9
U.S. and Wyoming Constitutions (V).....	3
Physical Activity and Health (P).....	1
Subtotal (min. core requirements).....	30-36
Hours for major, support areas and electives as determined by division....79-91	
<b>Total Hours</b>	<b>120-128</b>

\*Core Components are mutually exclusive of each other; hence, two core components may not be fulfilled by the same course. Except for the QA, core courses may have topics from the embeddable components list included in their curriculum, where appropriate.

## Courses taken for S/U

A maximum of 20 elective hours with a grade of S (satisfactory) may be included as part of the total credit requirements for graduation; but no S/U hours may be used to satisfy university, major requirements or required electives, unless the course is offered for S/U grading only.

**Minors in Agriculture and Natural Resources**

Minors provide a formalized recognition of concentrated study in a specific subject area. A minor degree offers recognition for academic achievement outside of the students' major course curriculum and gives students a concentration of work in the chosen minor area.

A minors program can enable students to enhance and expand career opportunities. A minor will also improve the possibility of admission to graduate programs in any chosen major, minor, or related field of study.

**Minors Available in the College of Agriculture and Natural Resources Include:**

- Agricultural business
- Agroecology
- Animal and veterinary science
- Apparel design
- Farm and ranch management
- Forest resources
- General agricultural economics
- Horticulture
- Human development and family sciences
- Human nutrition
- Insect biology
- Interior design
- International agricultural economics
- Molecular biology
- Natural resource economics
- Plant protection
- Rangeland ecology and watershed management
- Reclamation and restoration ecology
- Soil science

**Agricultural Communications Major**

A wide variety of courses in agriculture, communications, and journalism provides students with basic preparation for positions as broadcasters, editors or writers for farm and home organizations, state and federal agencies, magazines, newspapers, radio and television stations, and commercial businesses. Communication skills are also distinct assets in agricultural sales, research, service and teaching.

Students enrolled in agricultural courses acquire up-to-date and knowledgeable backgrounds of the subject matter. Courses in communication and journalism develop proficiencies demanded by employers of communication professionals.

**Minimum Requirements for Agricultural Communications Majors (B.S.)**

	Hrs.
University Studies Program requirements.....	30
Communications/journalism core .....	24
COJO 1000, 1040, 2010, 2100, 3530 and minimum of 9 hours of communication/journalism elective	
Agriculture core requirements .....	42
At least 18 hours must be lower division (Ag 1000-2000) elective courses, and at least 24 hours must be upper division (Ag 3000-4000) elective courses and include AGRI 4975.	
Supporting course requirement .....	4
STAT 2050 or 2070	
Additional hours for major and electives .....	20
<b>Total Hrs:</b>	<b>120</b>

Students wishing to pursue an area of emphasis in the agricultural communications option are encouraged to also select a minor. The college currently offers 19 minors, and any of these can help to better prepare students for employment or graduate work. (see above)

Agricultural communication majors also may complete an internship in their field. A variety of opportunities are available and students can work with the Associate Dean to determine an appropriate internship for their area of emphasis.

**Agriculture (AGRI)**

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

**1001. Intellectual Community and Information Literacy in Agriculture. 2. [I,L◀▶(none)]** For students interested in Environmental, Human and Life Sciences, Agriculture and Natural Resources, or for anyone with interests in Ecology and Behavior. Comprised of a series of guest presentations, supplemented by class discussions, case studies, field trips, and demonstrations, reflective writings, and small group, active cooperative learning activities.

**1520. Field Practices: Extension. 1-2 (Max. 2).** Project based work that includes practice applications of Extension programming. Directed by Extension faculty around matching topics of youth development, rangeland resources, food safety and nutrition, community development, or profitable and sustainable agriculture. Local issues are addressed in the context of applied research for public good.

**2100. International Experiences in Natural Resources. 1-3 (Max. 3).** Cultural and environmental topics in another country through classroom sessions, self study, and a visit to the host country. Topics discussed include similarities and differences in natural resource and environmental issues, history, traditions, and cultural norms, focusing on the host country and the United States.

**3000. Discovering and Utilizing Ideas and Information. 3. [I,L◀▶(none)]** Learning in this area guides students to accessing, evaluating, and utilizing information and ideas; communicating information and ideas effectively and responsibly; civic engagement for individual, organizational and community problem-solving, and applying new skills, knowledge, and perspectives in a contemporary society. Prerequisites: WA and junior status.

**4500. International Experiences in Agriculture. 1 (Max. 3).** Learn about agricultural customs in another country through classroom lectures, written assignments, and a visit to the host country during the spring break period. Topics discussed include the influence of foreign agriculture on U.S. economies and agricultural practices, focusing on the host country. Prerequisites: completion of WA course and junior standing.

**4520. Field Practicum: Extension Work. 1-4 (Max. 8).** Provides practical experiences to those wanting to pursue a career with Cooperative Extension Service. Interns are matched with county-based personnel for hands-on learning experiences across the state. Develop working knowledge of CES's mission to provide the citizens of Wyoming with education and applied research. Dual listed with AGRI 5520. Prerequisite: must pass volunteer screening process.

**4546. Agriculture: Rooted in Diversity. 3. [C,D◀▶(none)]** Addresses multiple themes related to diversity in agriculture with the goal of making visible the experiences of minorities and women in agriculture. Involves significant independent research, class discussion, project development, and development of oral and written communication skills. Establishes linkages with supporting disciplines. Cross listed with ENGL/AIST/CHST/FCSC/AMST/HIST 4546. Prerequisites: Junior class standing or consent of instructor and concurrent enrollment or major in any of the following: ethnic studies, agriculture, American studies, anthropology, English, history, sociology, or women's studies.

**4600. Developing Organizational Leadership. 3.** A senior capstone experience for Bachelor of Applied Science students, bringing together reading, research, writing, and com-



munication skills to focus on a major project. Leadership skills and approaches to organizational problem-solving are deepened using the structural, human resource, political, and symbolic frames to change and improve leadership and organizational culture. *Prerequisites:* COM1, COM2, AGRI 3000, and senior status.

**4960. Bachelor of Applied Science Internship. 6.** Provides Bachelor of Applied Science students academic credit for advanced work experiences in their area of specialization. Required to complete academic assignments such as a weekly journal, discussion and writing assignments in addition to their field-based responsibilities. Takes place in a mentored, supervised setting. *Prerequisites:* Bachelor of Applied Science student, AGRI 3000, senior status, and consent of instructor.

**4975. Agricultural Communications Senior Project. 1.** A baccalaureate degree capstone experience incorporating self assessments of student learning, reflective writings, and an analysis, synthesis and evaluation of the agricultural communications curriculum. Students develop and present a personalized, comprehensive, professional portfolio. *Prerequisite:* agricultural communication major with senior standing and WB.

**4990. Topics. 1-6 (Max. 8).** Accommodates topics whose subject matter is not included in other College of Agriculture and Natural Resources and Natural Resources offerings. Please see the class schedule for current topic. *Prerequisite:* WB.

**5520. Field Practicum: Extension Work. 1-4 (Max 9).** Organization, teaching, and promotion of county programs.

**5900. Practicum in College Teaching. 1-3 (Max 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies: 1 - 3. (Max 99).** Designed to provide an enrichment experience in a variety of topics. Note: Credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1 - 12. (Max 16).** Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

## Department of Agriculture and Applied Economics

206 Agriculture Building, 766-2386

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Web site: [www.uwyo.edu/ag/agecon](http://www.uwyo.edu/ag/agecon)

E-mail: [ag-econ@uwyo.edu](mailto:ag-econ@uwyo.edu)

Department Head: Roger Coupal

### Professors:

**NICOLE S. BALLENGER**, B.A. University of California, Santa Cruz 1975; M.S. University of California, Davis 1980; Ph.D. 1984; Professor of Agricultural Economics 2004.

**ROGER COUPAL**, B.S. Utah State University 1978; M.S. University of Arizona 1985; Ph.D. Washington State University 1997; Professor of Agricultural Economics 2015, 1997.

**DON MCLEOD**, B.S. St. John's College 1982; M.S. Oregon State University 1987; Ph.D. 1994; Professor of Agricultural Economics 2015, 1995.

**L. STEVEN SMUTKO**, B.S. Colorado State University 1978; M.C.R.P. North Dakota State University 1982; Ph.D. Auburn 1995; Spicer Chair of Collaborative Practice, Professor of Agriculture and Applied Economics 2009.

**DAVID T. TAYLOR**, B.S. Montana State University 1972; M.S. 1973; Ph.D. Colorado State University 1987; Professor of Agricultural Economics 1994, 1985.

**GLEN D. WHIPPLE**, B.A. Brigham Young University 1974; M.S. Utah State University 1976; Ph.D. Washington State University 1980; Professor of Agricultural Economics 1990, 1985; Director, UW Extension.

### Associate Professors:

**MATTHEW A. ANDERSEN**, B.A. Colorado College 1991; M.S. Colorado School of Mines 2000; Ph.D. University of California, Davis 2005; Associate Professor of Agricultural and Applied Economics 2013, 2007.

**CHRISTOPHER T. BASTIAN**, B.S. University of Wyoming 1987; M.S. 1990; Ph.D. Colorado State University 2004; Associate Professor of Agricultural and Applied Economics 2010, 2005.

**MARIAH D. EHMKE**, B.S. Kansas State University 1997; M.S. Ohio State University 2001; Ph.D. Purdue University 2005; Associate Professor of Agricultural Economics 2012.

**DANNELE E. PECK**, B.S. University of Wyoming 2000; M.S. 2002; Ph.D. Oregon State University 2006; Associate Professor of Agricultural Economics 2012.

**BENJAMIN S. RASHFORD**, B.S. University of Wyoming 1999; M.S. 2001; Ph.D. Oregon State University 2006; Associate Professor of Agricultural Economics 2012.

**JOHN RITTEN**, B.S. Arizona State University 2001; M.B.A. New Mexico State University 2004; Ph.D. Colorado State University 2008; Associate Professor of Agriculture and Applied Economics 2015, 2008.

### Assistant Professors:

**KRISTIANA M. HANSEN**, B.A. Reed College 1996; M.S. University of California, Davis 2003; Ph.D. 2008; Assistant Professor of Agriculture and Applied Economics 2009, 2012.

**CHIAN A. RITTEN**, Ph.D. Economics, Colorado State University; Assistant Professor of Agriculture and Applied Economics 2013.

### Academic Professionals:

**COLE EHMKE**, B.A. Bethany College 1997; M.S. University of Sydney, Australia 1999; Assistant University Extension Educator 2005.

**BRIDGER M. FEUZ**, Senior Extension Educator 2012.

**THOMAS FOULKE**, B.A. University of Montana 1985; M.S. University of Wyoming 1992; Associate Research Scientist 2005, 1998.

**JOHN HEWLETT**, B.S. Montana State University 1985; M.S. Oregon State University 1987; Extension Educator 1987.

### Temporary Lecturer:

**JIM THOMPSON**, B.A. Occidental College; M.A., Ph.D. University of Illinois-Chicago.

### Professors Emeritus:

Edward Bradley, Larry J. Held, James J. Jacobs. Dale Menkhous, Carl Olson, Alan C. Schroeder

The Department of Agricultural and Applied Economics offers three options within the agricultural business bachelor of science degree program. They are agribusiness management, farm and ranch management, and international agriculture. All three options focus on the development of critical thinking, research, negotiation, and communication skills for students interested in

1. agricultural operations,
2. small rural businesses;
3. community economics,
4. financial institutions,
5. agricultural and natural resources development and;
6. other pursuits where applied economic tools will be useful.

A brief description of minimum course requirements for each of the three options in agricultural business is given below. In addition, faculty advisers will work with students to tailor a curriculum to individual interests and goals.

### Agribusiness Management Option

This curriculum is for students preparing for careers in the agribusiness field. Applied agricultural economics courses are supplemented with marketing, management, finance and other courses from the College of Business and production-oriented courses from other departments in the College of Agriculture and Natural Resources.

#### Minimum Course Requirements for Agricultural Business (B.S.) Majors within the Agribusiness Management Option<sup>1</sup>

	Hrs.
First-Year Seminar (FYS).....	3
Writing .....	9
ENGL 1010 <sup>2</sup> (COM1), Communication II (COM2) <sup>3</sup> , AGEC 4965 and AGEC 4970 (COM3)	
Quantitative (Q) (required for major).....	7
MATH 1400; 2350 <sup>4</sup>	
Science <sup>5</sup> (PN) .....	6
Human Culture (H) .....	6
U.S. & Wyoming Constitutions (V).....	3
Agricultural Economics <sup>6</sup> .....	24
1010, 1020, 3400, 4050 or MKT 3210 (counts for upper-division AGEC and business credit), 4060, 4500; either 4450 or 4830 or 4840 or 4880; 3 hours of AGEC electives	
Supporting Agriculture .....	9
(other than Agricultural Economics)	
Statistics .....	4
Computers <sup>7</sup> .....	3
Supporting Economics.....	6
ECON 3010 and 3020	
Business .....	15
ACCT 1010 and 1020; and 9 hours of 3000-4000 level business courses	
Electives .....	25
<b>Total Hours</b>	<b>120</b>

<sup>1</sup>A minimum of 42 credits must be at the 3000 and 4000 level for graduation. At least 30 of the 42 credits must be earned from UW.

<sup>2</sup>Recommend or equivalent COM1 course.

<sup>3</sup>Majors in agribusiness management option must satisfy this requirement by earning 3 credits in a USP approved COM2 course.

<sup>4</sup>MATH 2350 is required as of fall 2008.

<sup>5</sup>Credits earned in USP approved science courses offered within the College of Agriculture and Natural Resources shall also serve as Supporting Agriculture credits.

<sup>6</sup>24 credit hours in Ag Econ beyond those earned to satisfy University Studies requirements.

<sup>7</sup>COSC 1200 recommended.

### Farm and Ranch Management Option

This curriculum is for students intending to become farm and/or ranch operators or professional managers of farms, ranches or feedlots. It is also well suited for students interested in the field of agricultural finance.

In this option, courses in farm and ranch management, finance, and marketing are supplemented by courses in crops, range management, veterinary sciences and animal science, with electives in other areas.

#### Minimum Course Requirements for Agricultural Business (B.S.) Majors within the Farm and Ranch Management Option<sup>1</sup>

	Hrs.
First-Year Seminar (FYS).....	3
Writing .....	9
ENGL 1010 <sup>2</sup> (COM1), Communication II (COM2) <sup>3</sup> , AGEC 4965 and AGEC 4970 (COM3)	
Quantitative (Q) (required for major).....	7
MATH 1400; 2350 <sup>4</sup>	
Science <sup>5</sup> (PN) .....	6
Biological Sciences.....	6
Physical Science .....	4
CHEM 1000 or 1020 or 1050	
U.S. & Wyoming Constitutions (V).....	3
Agricultural Economics <sup>6</sup> .....	28
1010, 1020, 2020, 3400, 4640, 12 hours AGEC electives	
Supporting Agriculture .....	12
SOIL 2010 (8 AG college hours other than Agricultural Economics)	
Statistics .....	4
Computers <sup>7</sup> .....	3
Supporting Economics.....	6
ECON 3010 and 3020	
Business .....	3
ACCT 1010 .....	32
Electives .....	32
<b>Total Hrs.</b>	<b>120</b>

<sup>1</sup>A minimum of 42 credits must be at the 3000 and 4000 level for graduation. At least 30 of the 42 credits must be earned from UW.

<sup>2</sup>Recommend or equivalent COM1 course.

<sup>3</sup>Major in the Farm and Ranch Management Option must satisfy this requirement by earning 3 credits in a USP approved COM2 course other than AGEC 3400.

<sup>4</sup>MATH 2350 is required as of fall 2008.

<sup>5</sup>Credits earned in USP approved science courses offered within the College of Agriculture and Natural Resources shall also serve as Supporting Agriculture credits.

<sup>6</sup>24 credits in Ag Econ beyond those earned to satisfy University Studies requirements.

<sup>7</sup>COSC 1200 recommended.

### International Agriculture Option

This curriculum is for students who desire training related to international agricultural business, and with agricultural and economic problems of developing nations. International trade and relations, world food production, agricultural and economic geography, economic development and comparative systems are emphasized in this program.

#### Minimum Course Requirements for Agricultural Business (B.S.) Majors within the International Agriculture Option<sup>1</sup>

	Hrs.
First-Year Seminar (FYS).....	3
Writing .....	9
ENGL 1010 <sup>2</sup> (COM1), Communication II (COM2), AGEC 4965 and AGEC 4970 (COM3)	
Quantitative (Q) (required for major).....	7
MATH 1400; 2350 <sup>3</sup>	
Science <sup>4</sup> (PN) .....	6
Social Science .....	6
SOC 1000 or POLS 1200	
U.S. & Wyoming Constitutions (V).....	3
Agricultural Economics .....	24
1010, 1020, 4060 or 4450, 4600 or 4660, 4880, and 6 hours of AGEC electives	
Supporting Agriculture <sup>5</sup> .....	6
Other than agricultural economics	
Statistics .....	4
Computers <sup>6</sup> .....	3
Supporting Business.....	12
BUSN/INST 2000, ECON 3010, 3020 and 4740	
Supporting International <sup>7</sup> .....	15
POLS 2310 or 3220 or 3230 or 3270 or 4240 or 4250 or 4330 or 3220; GEOG 1020 or 1030 or 3030 or 3050 or 3550; SOC/INST 4110 or 4300 or SOC 4600; AGEC 4930 <sup>8</sup> , BUSN 4540, MKT/INST 4540 and other pre-approved courses	
Foreign Language <sup>9</sup> .....	12
1010, 1020, 2030 .....	10
Electives .....	10
<b>Total Hrs.</b>	<b>120</b>

<sup>1</sup>A minimum of 42 credits must be at the 3000 and 4000 level for graduation. At least 30 of the 42 credits must be earned from UW.

<sup>2</sup>Recommended or equivalent COM1 course.

<sup>3</sup>MATH 2350 is required as of fall 2008.

<sup>4</sup>Credits earned in USP approved science courses offered within the College of Agriculture and Natural Resources shall also serve as Supporting Agriculture credits.

<sup>5</sup>Recommend AECL 1000, ANSC 1010, FDSC 1410, FCSC 1140, PLNT 2300, ENTO 1000 or 1001, REWM 2000 or 3020. Credits earned in USP approved science

courses offered within the College of Agriculture and Natural Resources shall serve as Supporting Agriculture credits.

<sup>6</sup>COSC 1200 recommended.

<sup>7</sup>The student is required to take once course in POLS, GEOG, and SOC listed plus a minimum of two additional courses. Students may elect to satisfy this with the equivalent INST courses. A maximum of 3 credits of AGECE 4930 can be applied within the International Agriculture option.

<sup>8</sup>An approved international internship or experience is highly recommended for the AGRI Business majors within the International Agricultural option.

<sup>9</sup>If a student wishes to use their elective hours to contribute to a minor in foreign language (18 hours beyond the 12 hours required, 6 credits of International Social Sciences, Business and Economics requirement can be waived).

### Livestock Management Option

This curriculum is for students intending to work in any sector of the livestock industry, ranging from input suppliers, to ranches, feedlots, meat packing companies, marketing and sales agents, futures/commodities exchange groups, policy makers, and international trade organizations. In this option, courses in farm and ranch management, agricultural finance, marketing, and trade are supplemented with courses in animal science, biology, range management, food science, data analysis, and other disciplines. Students may pursue a minor in Animal Science as part of this option, but can choose the non-minor version instead. Students will gain a broad understanding of both the business and science of the livestock industry.

### Minimum Course Requirements for Agricultural Business (B.S.) Majors within the Livestock Business Management Option (without a minor)

	<b>Hrs.</b>
First-Year Seminar (FYS) <sup>1,2</sup> .....	3
Writing - Communication <sup>2,3</sup> .....	9
COM1 <sup>2,3</sup> , COM2 <sup>2,3,4</sup> - AGECE 3020,	
COM3 - AGECE 4965 and AGECE 4970 <sup>3</sup>	
Quantitative (Q) .....	7
MATH 1400 <sup>2</sup> ; 2350 <sup>3</sup>	
Science (PN) <sup>5</sup> .....	8
CHEM 1000; LIFE 1010	
Human Culture (H) <sup>5</sup> .....	6
U.S. & Wyoming Constitutions (V).....	3
Agricultural Economics .....	31
AGECE 1010, 1020, 2020, 4640, 3400 or	
4710, 4060, 4050 or MKT 2310, AGECE	
4830 or 4840 <sup>8</sup> , 4880 or 4280 or ECON	
4720, AGECE 4500	

Additional Quantitative Skills.....	10
STAT 2050 or 2070 <sup>3</sup> ; COSC 1200 or	
IMGT 2400 <sup>9</sup> ; AGECE 4230 or 4840 or	
STAT 3050 or IMGT 2400 or 3400 or	
MATH 2355 or ACCT 1010 or 1020	
Biology of Livestock (for Animal Science	
minor <sup>10</sup> ) .....	36
LIFE 2022, ANSC 3010, ANSC 4120,	
ANSC 2010, ANSC 3100, LIFE 3050,	
ANSC 4540, ANSC 3150 or 4220	
or 4230 or 4240, PATB 4110. FDSC	
2040 <sup>12</sup> , FDSC 3060	
Biology of Livestock (for non-minor <sup>11</sup> ).....	36
LIFE 2022, ANSC 1010, ANSC 4050,	
REWM 2000, REWM 3020, LIFE	
3050, ANSC 4540, ANSC 2020, PATB	
4110 or REWM 4000, FDSC 2040,	
FDSC 3060	
Supporting Business.....	3
ECON 3020	
Electives .....	4-5
<b>Total Hrs.</b>	<b>120</b>

A minimum of 42 credits must be at the 3000 and 4000 level for graduation. At least 30 of the 42 credits must be earned from UW.

<sup>1</sup>Transfer students who earn an A.A., A.S. or A.B. are waived from all USP requirements except COM3, V, and departmental requirements (MATH 1400 & 2350). FYS is waived for transfer students with 30 or more credits earned after high school, or 1 full year completed at another college (but less than 30 credits completed). COM3 automatically fulfills old I, L requirements.

<sup>2</sup>Must earn a "C" or better.

<sup>3</sup>Or equivalent course.

<sup>4</sup>A transfer student may fulfill COM2 with an intermediate composition course **and** a public speaking course.

<sup>5</sup>PN and H may not be fulfilled by AGECE courses or any course cross listed with AGECE.

<sup>6</sup>USP 2015 no longer requires a PEAC (Physical Activity) course.

<sup>7</sup>18 hours of upper-division, not including AGECE 4965 or 4970.

<sup>8</sup>AGECE 4840 may not be double-counted towards both Agricultural Economics and Quantitative Skills.

<sup>9</sup>Suggest COSC 1200 for most, or AGRI 1010 (for inexperienced users), or IMGT 2400 (for advanced users).

<sup>10</sup>Must earn a "C" or better in all courses required in the minor to earn the minor.

<sup>11</sup>Courses identified for the non-minor option represent the most relevant livestock-related courses. However, if scheduling conflicts or other needs arise, advisors may petition for substitutions (except those in bold).

<sup>12</sup>FDSC 2040 is not actually required for the minor, but is recommended because of its relevance to all sectors of the livestock industry. Advisors may petition a substitution if it fits a student's needs better.

### Environment and Natural Resources

Students interested in natural resource or environmental issues or careers may complete any of the three options within agricultural business offered by the department with an environment and natural resource emphasis. Inquiries about environment and natural resource concentrations in agricultural business should be directed to the Department of Agricultural and Applied Economics.

### Minors Program

The department also offers five minor programs. These five minors are to give students majoring in other undergraduate curricula in the university a concentration of work in any of the four specialized undergraduate curricula offered by the department or in general agricultural economics. Each minor requires 27 hours in prescribed course work including 6 hours in supporting agriculture. Students need to plan their course work to meet course prerequisites.

**Agricultural Business Minor.** AGECE 1010, 1020, 4050 or MKT 3210 and 4060; Accounting 1010; 6 additional hours in upper-level agricultural economics courses; 6 hours in supporting agriculture courses.

**Farm and Ranch Management Minor.** AGECE 1010, 1020, 2020 and 4640; 9 additional hours in upper-level agricultural economics courses; 6 hours in supporting agriculture courses.

**International Agriculture Minor.** AGECE 1010, 1020, 3860 and 4880; 6 additional hours in upper-level agricultural economics courses; 3 or 4 hours in foreign culture or language; 6 hours in supporting agriculture courses.

**Natural Resource Economics Minor.** Required: AGECE 1020, 4700, 4720, and 4750; choose 9 additional hours from AGECE 4450, 4600, 4710; ECON 2400, 4400, 4410, 4520 (note: College of Business prerequisites); ENR 4500.

**General Agricultural Economics Minor.** AGECE 1010, 1020 and 15 additional hours in agricultural economics courses with 12 hours at the upper-level; 6 hours in supporting agriculture courses.

## Graduate Study

The Department of Agricultural and Applied Economics offers graduate work leading to the Master of Science degree. Students may choose among major options in the areas of agricultural and applied economics and agricultural business. The agricultural economics major emphasizes research with any of the following focus areas:

- production economics and management,
- marketing and market analysis,
- resource and environmental economics,
- international agriculture, and
- economic and rural development

The agricultural business option offers advanced skills to students who desire professional careers in the business sector. Students in the agricultural business option may concentrate their coursework and writing in management, marketing, or finance. Dual majors in water resources, and environment and natural resources are also offered.

Finally, the Department offers a graduate minor in applied economics. This program is for currently enrolled graduate students in other disciplines seeking a foundation in economics as well as their major discipline.

### Program Specific Admission Requirements

Undergraduate major in agricultural economics or economics is not required.

Students may be required to complete program prerequisite courses, without graduate credit, that were not completed in their undergraduate education.

Specifically, students who have not completed at least one course in calculus, statistics, intermediate microeconomic theory and intermediate macroeconomic theory will be required to complete these courses without graduate credit during their first semester in residence.

### Program Specific Degree Requirements

#### *Master of Science in Agricultural Economics*

The following courses constitute the M.S. in Agricultural Economics core requirements and are required of both Plan A and Plan B candidates (20 hours).

#### Economic Theory

AGEC 5310 Theory of the Firm and Producer Behavior.....	3
AGEC 5630 Advanced Natural Resource Economics .....	3

AGEC 5710 Advanced Agricultural Market Theory .....	3
AGEC 5740 Theory of Consumer Behavior .....	3

#### Quantitative Methods

AGEC 5230 Intermediate Econometric Theory .....	3
AGEC 5320 Quantitative Methods in Agricultural Econ.....	3

#### Research

AGEC 5650 Research Methods.....	1
AGEC 5880 Advanced Seminar.....	1

#### *Plan A (thesis):*

Minimum of 30 credit hours including AGECE M.S. core requirements, thesis hours and electives.

No more than three hours of AGECE coursework numbered below 5000-level count toward the 30 hour requirement.

Achieve a cumulative 3.0 GPA in the AGECE M.S. core requirements.

The student's graduate committee, nominated by the major professor, the student, and the department head determine the final program of study and thesis research topic.

Presentation of research results at a formal public seminar.

Completion of an oral examination covering the student's thesis research administered by the graduate committee.

#### *Plan B (non-thesis):*

Minimum of 32 hours of coursework;

Non-thesis business analysis paper accepted by the student's graduate committee;

Minimum of 13 credit hours of agricultural economics coursework numbered at the 5000-level are required, including:

- AGEC 5310
- AGEC 5740
- AGEC 5880
- AGEC 5630 or 5710
- AGEC 5320 or 5230

In addition, students are required to complete 3 credit hours from each of the following three areas:

- Management:  
AGEC 4060, 4640 or 5460; or MGT  
4410, 4420, 4440, 4470, or 4520
- Marketing:  
AGEC 4050, 4830, 4840, 4880, or 5710,  
or MKT 4240, 4430, 4520, or 4540
- Finance:  
AGEC 4500; or FIN 4510, 4520,  
4610, 4810; or ECON 4740

Remaining credit hours will be filled with electives.

The student's graduate committee, nominated by the major professor, the student and the department head determine the final program of study and business analysis topic.

Presentation of the business analysis paper at a formal public seminar.

An internship experience is strongly encouraged as part of the agricultural business option (AGECE 5990).

#### *Master of Science in Agricultural Economics/ Water Resources; Plan A (thesis):*

Students must complete the 26 credit hour agricultural and applied economics including M.S. core requirements plus 4 thesis hours and 10 credit hours in water resources approved courses.

Please refer to Water Resources Degree program in this *Catalog* for updated degree requirements.

Achieve a cumulative 3.0 GPA in the AGECE M.S. core requirements.

The student's graduate committee, nominated by the major professor, the student and the department head determine the final program of study and business analysis topic, which must be in the water resources area.

Presentation of research results at a formal public seminar.

Completion of an oral examination covering the student's thesis research administered by the graduate committee.

#### *Master of Science in Agricultural Economics/ Environment and Natural Resources (ENR); Plan A (thesis):*

Students must complete the 26 credit hour agricultural and applied economics including M.S. core requirements plus 4 thesis hours and 15 credit hours in environment and natural resources, as approved by the student's committee and the ENR academic adviser;

Achieve a cumulative 3.0 GPA in the AGECE M.S. core requirements;

The student's graduate committee, nominated by the major professor, the student and the department head determine the final program of study and business analysis topic, which must be in the area of environment and natural resources;

Presentation of research results at a formal public seminar;

Completion of an oral examination covering the student's thesis research administered by the graduate committee.

**Graduate Minor in Applied Economics:**

Graduate standing;

AGEC 4640, AGECE 5310 or 5740, AGECE 5320 or 5230, and 6 additional credits of graduate AGECE courses;

Committee selection for the student's major thesis or dissertation committee should include at least one faculty member from AGECE.

## Agricultural Economics (AGECE)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

**1000. Agricultural and Applied Economics Orientation. 2. [I,L♦♦(none)]** Directs students through a series of short writing and research exercises designed to improve the academic skills of new or prospective agribusiness majors. Also explores cultural diversity, career opportunities and degree requirements for majors, and strategies for using campus resources. Offered S/U only. (Normally offered fall semester)

**1010. Principles of Macroeconomics I. 3. [CS♦♦(none)]** A beginning study of how economic society is organized and uses scarce resources to provide for its material wants. National income analysis; business cycles; the banking system; monetary and fiscal policy. Inflation and unemployment. Cross listed with ECON 1010.

**1020. Principles of Microeconomics. 3. [CS♦♦(none)]** A basic study of value and price theory, monopoly and public policy; markets for productive goods and services; alternative forms of economic organization; international trade. Cross listed with ECON 1020.

**1101. First-Year Seminar. 3. [(none)♦♦FYS]**

**2020. Farm and Ranch Business Management. 4.** Discusses economic principles, business methods and science applied to organization and operation. Includes measurements of size of business; rate and efficiency of production. (Normally offered fall semester)

**3000. Small Enterprise Management. 3.** Discusses tools for managerial decision-making, including demand analysis, input and output decisions, short- vs. long-term decision-making, linear programming, and risk management. Students will apply this knowledge to small-scale production and value-added agriculture, niche markets, and alternative enterprises. Prerequisites: AGECE 1020 or ECON 1020 and MATH 1400.

**3020. Practice Makes Perfect: Applying Principles of Economics to Current Agricultural and Agribusiness Problems. 3. [(none)♦♦COM2]** The purpose of the class is twofold: to practice the application of concepts, tools, and models from principles of economics to real-world problems and issues affecting agriculture and agribusiness; and to develop foundational written, oral, and digital communication skills for sharing knowledge and understanding or applied economic analyses. Prerequisites: AGECE/ECON 1020 and AGECE/ECON 1010, or equivalent, and satisfactory completion of COM1 requirements. COSC 1200 recommended.

**3400 [4400]. Agricultural Law. 3. [WB♦♦(none)]** Surveys legal issues and principles of practical concern to agriculture and examines legal institutions authorized to carry out laws affecting agriculture. Prerequisite: WA and junior standing. (Normally offered fall semester)

**3750 [4750]. Natural Resource Planning and Economics. 3.** Economic concepts and rudimentary analytical tools are applied to federal, state and local natural resource planning and management programs. The value of economic input into natural resource policy is examined. Evaluating tradeoffs and resolving conflicts play a particularly important role in the course content. Cross listed with ENR 3750. Prerequisites: QA, WA and junior standing. (Offered spring semester of odd-numbered years)

**3860 [4860]. Economics of World Food and Agriculture. 3. [G♦♦(none)]** Explores global food and agricultural issues with a focus on hunger, chronic malnutrition, and diets of people in developing countries. Introduces basic economic concepts pertinent to understanding and analyzing global food markets and prices and to evaluating government policies designed to reduce food insecurity, enhance diets, and promote agricultural development. Cross listed with INST 3860. Prerequisite: An economics principles course. (Normally offered spring semester)

**4050. Agribusiness Marketing. 3.** Students develop a strategic marketing plan for an agricultural and food product. Content includes study of aspects of the global food industry influencing consumer demand; contemporary topics in food marketing and policy; agricultural supply marketing; marketing research methods; marketing profitability measures; pricing; new product introduction; branding, and industry competitive analysis. Prerequisites: AGECE 1020 or ECON 1020 and MATH 1400. (Normally offered spring semester)

**4060. Agribusiness Management. 3.** Applies quantitative, economic, financial and managerial analysis to agribusiness sector. Prerequisites: AGECE 1020 and MATH 1400. (Normally offered fall semester)

**4070. Agricultural Sales. 3.** Applies transactional analysis for understanding human behavior in agribusiness sales. Introduces experimental learning and fundamentals of agribusiness sales. Prerequisites: AGECE 1020 and COJO 1010 or COJO 2010. (Normally offered spring semester)

**4200. Gender and Race in the Economy. 3. [D♦♦(none)]** Focuses on the role gender and race play in the economy; specifically the way that gender and race affect economic outcomes for individuals in the United States. Cross listed with WMST 4200. Dual listed with AGECE 5200. Prerequisites: AGECE 1020 or equivalent, or SOC 1000, or WMST 1080, and WB.

**4230. Intermediate Econometric Theory. 3.** Covers simple and multiple regression models, problems of estimation, hypothesis and diagnostic testing, dummy variable, autoregressive and distributed lag models, and time-series analysis. The objective is to understand the underlying theory of econometric modeling and obtain operational ability to construct, estimate, and test econometric models. Cross Listed with ECON 4230; dual listed with AGECE 5230. Prerequisites: ECON 3020, STAT 2050 and MATH 2350. (Normally offered spring semester)

**4280. International Food and Farm Cultures. 3. [G♦♦(none)]** Study-tour course in western France of lectures, fieldtrips, and other cultural activities are integrated into a curriculum to study sustainable food cultures and farming systems. Students live with host families and learn about current policies, belief systems and cultural practices that guide food production, consumption and marketing in Europe. Prerequisite: completion of WA and I.

**4450. Negotiation. 3.** Examines how to use negotiation to resolve conflict and get agreement. Describes conflict; outlines ways to address conflict; examines different negotiation strategies and the impact of cognitive bias, power, ethics, and individual and cultural differences; and explores mediation practices. Students complete negotiations, role-plays, and questionnaires. Cross listed with ENR 4450. Dual listed with AGECE 5450. Prerequisite: completion of USP O requirement; junior standing.

**4460 [5460]. Agriculture and Economic Development. 3.** Examines the roles of agriculture in the transformation of the economics of underdeveloped countries. Examines devel-

opment theories, case studies and analytical techniques. *Prerequisites:* AGECE 1010, 1020 and a G course.

**4500 [650]. Agricultural Finance. 3.** Principles of financial management; compounding and discounting; leverage and capital budgeting and alternatives in resource control. *Prerequisite:* AGECE 1020 or equivalent. (Normally offered fall semester)

**4550. Negotiation Analysis. 3.** Focuses on using an analytical perspective for maximizing joint gains between negotiators. Students learn analytical techniques to prepare for negotiation, evaluate options and proposals during a negotiation, and evaluate negotiated outcomes with respect to maximization of joint gains and fairness criteria. Dual listed with AGECE 5550; Cross listed with ENR 4550. *Prerequisite:* QA.

**4600. Community Economic Analysis. 3. [(none)◀▶H]** Analysis of regions and rural communities; their problems, socioeconomic characteristics, land use and economic development. Provides training in regional economic analysis, fiscal impact analysis and benefit cost analysis. Dual listed with AGECE 5600. *Prerequisites:* ECON 3010, 3020, and MATH 1400.

**4640. Advanced Farm/Ranch Management. 3.** Tools of management decision-making applied to problems of farm-ranch management and resource acquisition and use. *Prerequisites:* AGECE 1020, 2020 and MATH 1400. (Normally offered spring semester)

**4660. Community and Economic Development. 3.** Community development from an interdisciplinary perspective, integrating theory, concepts and methods from sociology, economics, political science, and community development. Students learn how community theory can be used to design and support effective economic development programs. Includes readings, lectures, guest lectures, field trips and community analysis projects. Dual listed with AGECE 5660. *Prerequisites:* AGECE/ECON 1020 or SOC 2090 and junior standing.

**4700. Economics of Range Resources. 3.** Applies economic and decision theory to management and allocation of public and private range resources. *Prerequisite:* AGECE 1020 or equivalent. (Normally offered fall semester)

**4710. Natural Resource Law and Policy. 3.** Legal and economic examination of laws intended to resolve environmental conflicts. Surveys economic rationales both for private property and government intervention in environmental disputes; content of selected environmental laws in the U.S.; and basic prin-

ciples of environmental mediation. *Prerequisites:* AGECE 1020, ECON 1020 or equivalent and 3 hours of business law or agricultural law. (Offered fall semester of even-numbered years)

**4720. Water Resource Economics. 3.** Presents principles and procedures appropriate to water resource allocation and development decisions. Studies agricultural, recreational, industrial and other uses of water. Includes a field trip. *Prerequisite:* AGECE 1020 or equivalent; QB course, WB course; senior standing. (Offered fall semester of even-numbered years)

**4740. Agricultural Policy. 3.** Identifies problems in agriculture and considers alternative programs. *Prerequisite:* AGECE 1020 or equivalent. (Offered spring semester of odd-numbered years)

**4830. Agricultural Commodities and Futures Markets. 3.** Economics of price determination for agricultural commodities and development of pricing strategies in cash and futures markets. *Prerequisite:* AGECE 1020 or equivalent. (Normally offered fall semester)

**4840. Agricultural Market Analysis. 3.** Applies economic theory to an analysis of economic organization and operation of agricultural markets, including price behavior. *Prerequisites:* MATH 1400 and ECON 3020. (Offered spring semester of odd-numbered years)

**4880. International Agricultural Trade, Markets and Policy. 3. [G◀▶(none)]** International agricultural commodity markets, product markets and market channels are characterized and examined. Presents economic theory relevant to description and analysis of international markets. Characterizes and analyzes historical and contemporary U.S. commercial trade policy and agricultural policy and their effect on markets. *Prerequisites:* AGECE 1010 and 1020 or equivalent and ECON 3020. (Offered spring semester of even-numbered years)

**4890. Special Topics in \_\_\_\_\_. 1-3 (Max. 6).** Accommodates seminar series or course offering by visiting faculty whose subject matter is not included in other courses. *Prerequisites:* junior standing and/or consent of instructor. (Offered based on sufficient demand and resources)

**4910. Problems in Agricultural Economics. 1-3 (Max. 6).** Consists of supervised study and investigation on topics of current importance in agricultural economics. *Prerequisites:* 12 hours in AGECE or ECON and consent of instructor.

**4930. Agricultural Economics Internship. 1-6 (Max. 6).** Provides practical agricultural business firm and/or agency experience. Develops working knowledge of how basic

economic concepts are used by firms and agencies in policy and procedures development and decision making by the organization. *Prerequisites:* 10 hours of AGECE and approval of faculty supervisor.

**4950. Senior Seminar and Thesis I. 1. [WC◀▶(none)]** Beginning of preparation and presentation of senior research thesis relevant to agriculture economics field. *Prerequisites:* 15 hours of AGECE and/or ECON and WB writing course.

**4960. Senior Seminar and Thesis II. 2. [WC◀▶(none)]** Final preparation and presentation of senior thesis and writing of final report. *Prerequisite:* AGECE 4950.

**4965. Agribusiness Strategy and Ethics Capstone. 3. [WC◀▶COM3\*]** Integrates economic theory, strategic management, and ethical principles into management decision analysis related to food, agricultural, and resource-based industries. Students develop the appropriate professional documents, interpersonal communication skills, and oral presentation skills to pursue career in agribusiness management. Emphasis is placed on refining students' professional writing abilities. *Prerequisites:* senior standing, 15 hours of AGECE and/or ECON and WB writing course. *\*Both AGECE 4965 and AGECE 4970 must be completed successfully in order to earn USP 2015 COM3.*

**4970. Technical Communication for Agribusiness. 3. [(none)◀▶COM3\*]** This course is the senior capstone for agribusiness majors. Students will use written, oral, and digital communication appropriate for the discipline to complete a technical report and oral presentation on a complex topic affecting agriculture or natural resources. *\*Both AGECE 4965 and AGECE 4970 must be completed successfully in order to earn USP 2015 COM3.*

**5200. Gender and Race in the Economy. 3.** Focuses on the role gender and race play in the economy; specifically the way that gender and race affect economic outcomes for individuals in the United States. Cross listed with WMST 5200. Dual listed with AGECE 4200. *Prerequisites:* AGECE 1020 or equivalent, or SOC 1000, or WMST 1080, and WB.

**5230. Intermediate Econometric Theory. 3.** Covers simple and multiple regression models, problems of estimation, hypothesis and diagnostic testing, dummy variables, autoregressive and distributed lag models, and time-series analysis. The objective is to understand the underlying theory of econometric modeling and obtain operational ability to construct, estimate, and test econometric models. Dual listed with AGECE 4230. *Prerequisites:* ECON 3020, STAT 2050 and MATH 2350.

**5310. Theory of Producer Behavior. 3.** Economic models of optimization as they apply to firm-level production decisions. Topics include the properties of production functions, theories of linear and non-linear optimization, firm decision making under perfect and imperfect competition and firm decision making under uncertainty. *Prerequisites:* ECON 3020, STAT 2050 and MATH 2350.

**5320. Quantitative Methods in Agricultural Economics. 3.** Covers mathematical programming and simulation techniques for solving applied problems in agricultural economics. Emphasizes the formulation of economic research problems in quantitative terms and the use of computer software packages to derive solutions. *Prerequisites:* ECON 3020, STAT 2050 and MATH 2350.

**5450. Negotiation. 3.** Examines how to use negotiation to resolve conflict and get agreement. Describes conflict; outlines ways to address conflict; examines different negotiation strategies and the impact of cognitive bias, power, ethics, and individual and cultural differences; and explores mediation practices. Students complete negotiations, role-plays, and questionnaires. Cross listed with ENR 5450. Dual listed with AGECE 4450. *Prerequisite:* completion of USP O requirement; junior standing or consent of instructor.

**5550. Negotiation Analysis. 3.** Focuses on using an analytical perspective for maximizing joint gains between negotiators. Students learn analytical techniques to prepare for negotiation, evaluate options and proposals during a negotiation, and evaluate negotiated outcomes with respect to maximization of joint gains and fairness criteria. Dual listed with AGECE 4550; Cross listed with ENR 5550. *Prerequisite:* QA.

**5600. Community Economic Analysis. 3.** Analysis of regions and rural communities; their problems, socioeconomic characteristics, land use and economic development. Provides training in regional economic theory, regional economic analysis, fiscal impact analysis and benefit cost analysis. *Prerequisite:* ECON 3010, 3020 and MATH 1400; or consent of instructor.

**5630. Advanced Natural Resource Economics. 3.** An in-depth treatment of theoretical issues, quantitative techniques, and institutional arrangements in the natural resource field. Topics include welfare economics, property rights, market failure and externalities, and benefit cost analysis. *Prerequisites:* ECON 3010 and 3020, STAT 2050 and MATH 2350.

**5650. Research Methods. 1.** Examines scientific methods as they specifically relate to a masters level research project in applied eco-

nomics. This includes formulating the research question, developing hypotheses, determining a theoretical framework from which the data gathering and analysis will proceed and lead to reporting research outcomes. *Prerequisites:* ECON 3010 and 3020, STAT 2050.

**5660. Community and Economic Development. 3.** Community development from an interdisciplinary perspective, integrating theory, concepts and methods from sociology, economics, political science, and community development. Students learn how community theory can be used to design and support effective economic development programs. Includes readings, lectures, guest lectures, field trips and community analysis projects. Dual listed with AGECE 4660. *Prerequisite:* AGECE/ECON 1020 or SOC 2090 and junior standing.

**5710. Advanced Agricultural Market Theory. 3.** Theoretical foundations of the study of agricultural markets and how business is conducted in those markets. Topics include pure competition, industrial organization concepts related to imperfect competition including game theory, principal-agent theory, transaction costs economics, intermediary theory, and welfare implications of alternative agricultural market structures. *Prerequisites:* ECON 3020 and MATH 2350.

**5740. Consumer Behavior and Prices Analysis. 3.** Focuses on microeconomic consumer theory and its application. Topics include utility theory, market demand theory, expected utility theory, and econometric applications. *Prerequisites:* ECON 3020, MATH 2350 and STAT 2050.

**5880. Advanced Seminar. 1-2 (Max. 2).** Involves reporting to the seminar group on research methods and results obtained in the investigation of a topic or question relevant to the field of agricultural economics. *Prerequisite:* 9 credits in AGECE and/or ECON.

**5890. Advanced Problems in Agricultural Economics. 1-3 (Max. 6).** Supervised study and research on current problems in marketing, farm and ranch management, policy prices, land economics or finance. *Prerequisite:* graduate standing in AGECE or ECON.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: Credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrolled in a graduate degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Department of Animal Science

101 Animal Science/Molecular Biology Bldg., 766-2224

FAX: (307) 766-2355

Web site: [uwyo.edu/anisci](http://uwyo.edu/anisci)

Department Head: Michael Day

### Professors:

**MICHAEL L. DAY**, B.S. University of Missouri 1980; M.S. University of Nebraska 1982; Ph.D. 1985; Professor of Animal Science 2015.

**STEPHEN P. FORD**, B.S. Oregon State University 1971; M.S. West Virginia University 1973; Ph.D. Oregon State University 1977; Professor of Animal Science 2000.

**BRET W. HESS**, B.S. University of Nevada, Reno 1991; M.S. 1993; Ph.D. University of Missouri-Columbia 1996; Professor of Ruminant Nutrition 2008, 2002.

**RICHARD J. MCCORMICK**, B.S. University of Connecticut 1979; M.S. 1980; Ph.D. Kansas State University 1985; Professor of Animal Science 1997, 1985.

**DANIEL C. RULE**, B.S. University of California, Davis 1977; M.S. 1980; M.S. Washington State University; Ph.D. Iowa State University 1984; Professor of Animal Science 1999, 1987.

### Associate Professors:

**BRENDA M. ALEXANDER**, B.S. University of Wyoming 1986; M.S. 1988; Ph.D. 1999; Associate Professor of Animal Science 2012.

**KRISTI M. CAMMACK**, B.S. South Dakota State University 1999; M.S. University of Nebraska-Lincoln 2001; Ph.D. University of Missouri Columbia 2005; Associate Professor of Animal Science 2014, 2012.

**SCOTT L. LAKE**, B.S. University of Nevada 1998; M.S. 2001; Ph.D. University of Wyoming 2005; Associate Professor of Animal Science 2014, 2008. Extension Livestock Specialist.

**PAUL A. LUDDEN**, B.S. University of Nebraska-Lincoln 1991; M.S. Purdue University 1994; Ph.D. University of Missouri-Columbia 1997; Associate Professor of Ruminant Nutrition 2004, 1998.

**WARRIE J. MEANS**, B.S. Colorado State University 1979; M.S. 1982; Ph.D. 1985; Associate Professor of Animal Science 2002, 1992.

**STEVEN I. PAISLEY**, B.S. University of Wyoming 1993; M.S. 1995; Ph.D. Oklahoma State University 1998; Extension Beef Cattle Specialist; Associate Professor of Animal Science 2007, 2001.

**Assistant Professors:**

**BLEDAR BISHA**, D.V.M. Agricultural University of Tirana-Albania 1999; M.S. Iowa State University 2004; Ph.D. 2009; Assistant Professor of Animal Science 2013.

**WEI GUO**, B.S. College of Life Science 1999; Ph.D. China Agriculture University 2004; Assistant Professor of Animal Science 2013.

**Academic Professional Lecturers:**

**CALEB BOARDMAN**, B.S. Texas A&M University 2012; M.S. 2014; Academic Professional Lecturer 2015.

**JENNIFER A. INGWERSON**, B.S. University of Nebraska-Lincoln 2005; M.S. Iowa State University 2014; Academic Professional Lecturer 2014.

**Adjunct Professors:**

Thomas Hansen, John Johnston, Tom McDonald, Peter Nathanielsz, Mark Nijland, Donal Skinner, D. Paul Thomas, Heywood Sawyer

**Professors Emeriti:**

Ray Field, Frank Hinds, Doug Hixon, Steven W. Horn, Conrad Kercher, Gary Moss, William Murdoch, Johannes Nel, Bibek Ray

The Department of Animal Science offers a variety of courses in animal and food science. The department uses modern laboratories and excellent animal facilities including a livestock teaching arena and a meat processing facility.

The Department of Animal Science and the Department of Veterinary Science have a combined curriculum, under Animal and Veterinary Science (ANVS). The curriculum has options in production, range livestock, business, communication, animal biology, preveterinary medicine, meat science and food technology, and equine science. The curriculum leads to a wide variety of career opportunities for animal and veterinary science graduates.

**Animal and veterinary science**

The Department of Animal Science and the Department of Veterinary Sciences have combined their efforts to offer several degree options leading to the bachelor of science degree in animal and veterinary science. Courses in animal science, food science, and pathobiology are the core offerings in the various options.

Agriculture, in its broadest definition, is the nation's largest industry. Livestock production is Wyoming's largest agricultural enterprise. Animal agriculture and its associated industries offer many opportunities for the interested student. Whether a student is interested in production livestock, allied fields such as meat science, business or animal health, or wants to apply to a college of veterinary medicine, the degree tracks offered will form the basis for a challenging career in animal agriculture/biology. The various options provide maximum flexibility to meet the changing needs of students and their employers. For students interested in pursuing advanced research, M.S. and Ph.D. degrees are offered.

Several degree options allow for specialization and graduate or professional school preparation. A brief description of each option and the educational opportunities they provide is given with the course requirements.

A grade of C or better must be earned in the following courses when the courses are required in the individual option for completion of the degree: ANSC 3010, 3100, 4120, 4540, 4630; FDSC 3060, PATB 4110, PATB 4111, LIFE 1010, 2022.

Students are encouraged to participate in activities related to their degree option. The university has livestock, horse and meats judging teams. Each team travels and participates in at least one major exposition a year. Each year, the Academic Quadrathlon competition is held, combining practical and classroom skills for students. Field trips, as practical teaching aids in many classes, are scheduled throughout the year. Internships are available to gain practical experience. Student organizations such as the Block and Bridle Club, Food Science Club, Microbiology Club, Range Club, and the Pre-vet Club provide additional educational and recreational opportunities.

**Production Option**

This option provides a strong background in livestock production and management. Students interested in livestock production should enroll in this option.

Animal and Veterinary Science.....  
 Required courses: ANSC 1010, 2020, 3010\*, 3100\*, 4120\*, 4540\*, 4630\* (COM3) and two courses selected from ANSC 3150, 4220, 4230, or 4240; PATB 4110\*  
 Agricultural Sciences .....  
 Required courses: FDSC 2040, 3060\*; AGECE 1020, 2020; REWM 2000  
 Other math/science courses .....  
 Required courses: LIFE 1010\* (PN), 2022\*, 3050; CHEM 1000 (PN), ANSC 2010 or CHEM 2300, MATH 1400 (Q); STAT 2050 or 2070  
 Other communication courses.....  
 ENGL 1010\* (COM1) and a COM2\* course  
 Other University Studies courses .....  
 First-Year Seminar\* (FYS), 2 courses in Human Culture (H), and U.S. and Wyoming Constitutions (V)  
**Required credits 128\*\***

\*A grade of C or better must be earned in these courses for successful completion of degree.  
 \*\*Required credits: 128 total credit hours, 42 credit hours or more at the 3000-level or above.

**Range Livestock Option**

This option emphasizes range livestock management. Students interested in the management of livestock and range resources should enroll in this option.

Animal and Veterinary Science.....  
 Required courses: ANSC 1010, 3010\*, 3100\*, 2020 or 4100, 4120\*, 4150, 4220, 4230 or 3150, 4540\*, 4630\* (COM3); PATB 4110\*  
 Rangeland Ecology and Watershed Management .....  
 Required courses: REWM 2000, 2500, 3500, 4000, 4330, 4900  
 Agricultural Sciences .....  
 Required courses: FDSC 2040, 3060\*; AGECE 1020, 2020  
 Other math/science courses .....  
 Required courses: LIFE 1010\* (PN), 2022\*, 3050; CHEM 1000 (PN), ANSC 2010 or CHEM 2300, MATH 1400(Q); STAT 2050 or 2070  
 Other communication courses.....  
 ENGL 1010\* (COM1) and a COM2 course  
 Other University Studies courses .....  
 First-Year Seminar\* (FYS), 2 courses in Human Culture (H), and U.S. and Wyoming Constitutions (V)  
**Required credits 128\*\***

\*A grade of C or better must be earned in these courses for successful completion of degree.



\*\*Required credits: 128 total credit hours, 42 credit hours or more at the 3000-level or above.

**Business Option**

Students desiring a strong background in business in addition to the basic courses in animal and veterinary science should enroll in this option. Graduates will be qualified for careers in the livestock agribusiness industry. Animal and Veterinary Science.....

Required courses: ANSC 1010, 2020, 3010\*, 3100\*, 4120\*, 4540\*, 4630\* (COM3) and two courses selected from ANSC 3150, 4220, 4230 or 4240; PATB 4110\*

Agricultural Economics and Business.....

Required courses: AGECE 1010, 1020, 3860 or 4880; AGECE 4050 or MGT 3210; AGECE 4060 or MKT 3210; ACCT 1010

Agricultural Sciences .....

Required course: FDSC 3060\*

Other math/science courses.....

Required courses: LIFE 1010\* (PN), 2022\*, 3050; CHEM 1000 (PN), ANSC 2010 or CHEM 2300, MATH 1400 (Q); STAT 2050 or 2070

Other communication courses.....

ENGL 1010\* (COM1) and a COM2 course

Other University Studies courses .....

First-Year Seminar\* (FYS), 2 courses in Human Culture (H), and U.S. and Wyoming Constitutions (V)

**Required credits 128\*\***

\*A grade of C or better must be earned in these courses for successful completion of degree.

\*\*Required credits: 128 total credit hours, 42 credit hours or more at the 3000-level or above.

**Communication Option**

Students in this option obtain a basic education in animal and veterinary science and also acquire in-depth communication skills. Students interested in careers in agriculture communications with emphasis on the livestock industry should enroll in this option. Animal and Veterinary Science.....

Required courses: ANSC 1010, 2020, 3010\*, 3100\*, 4120\*, 4540\*, 4630\* (COM3) and two courses selected from ANSC 3150, 4220, 4230, or 4240; PATB 4110\*

Communication .....

Required courses: COJO 2010 (COM2), plus 14 additional credit hours in COJO

Agricultural Sciences .....

Required course: FDSC 3060\*

Other math/science courses.....

Required courses: LIFE 1010\* (PN), 2022\*, 3050; CHEM 1000 (PN), ANSC 2010 or CHEM 2300, MATH 1400 (Q); STAT 2050 or 2070

Other communication course .....

ENGL 1010\* (COM1)

Other University Studies courses .....

First-Year Seminar\* (FYS), 2 courses in Human Culture (H), and U.S. and Wyoming Constitutions (V)

**Required credits 128\*\***

\*A grade of C or better must be earned in these courses for successful completion of degree.

\*\*Required credits: 128 total credit hours, 42 credit hours or more at the 3000-level or above.

**Animal Biology Option**

This option within the major requires more complete and stringent basic sciences. Students may complete premedical requirements or other pre-professional allied health requirements while completing a B.S. degree that prepares them for alternate career choices. Selected courses provide opportunity for more complete exposure in both biological sciences and pathobiology. Possible alternatives to professional schools include graduate school admission or employment by government or industry in research, promotion or sales.

Because of the variation in pre-professional requirements for different professional programs, students are encouraged to determine the specific requirements of the programs in which they are interested.

Animal and Veterinary Science.....

Required courses: ANSC 1010, 3010\*, 3100\*, 4120\*, 4630\* (COM3); PATB 4400

Agricultural Sciences .....

Required courses: FDSC 3060\*; MICR/MOLB 2021 or 2240; MOLB 3610 and 4100 or MOLB 4600 and 4610

Other math/science courses.....

Required courses: LIFE 1010\* (PN), 2022\*, 3050; CHEM 1020 (PN), 1030, 2300 or CHEM 2420 and 2440; PHYS 1110, 1120; ZOO/PSYC 3600; MATH 1400, 1405, 2200 (Q); STAT 2050 or 2070

Other communication courses.....

ENGL 1010\* (COM1) and a COM2 course

Other University Studies courses .....

First-Year Seminar\* (FYS), 2 courses in Human Culture (H), and U.S. and Wyoming Constitutions (V)

**Required credits 128\*\***

\*A grade of C or better must be earned in these courses for successful completion of degree.

\*\*Required credits: 128 total credit hours, 42 credit hours or more at the 3000-level or above.

**Meat Science and Food Technology Option**

Students taking this option will have an excellent background for entering the meat industry. The food industry is the largest employer in this country and offers a wide variety of career opportunities.

Animal and Veterinary Science.....

Required courses: ANSC 1010, 3010\*, 3100\*, 4050, 4630\* (COM3); PATB 4110\*

Food Science .....

Required courses: FDSC 1410, 2040, 3060\*, 3062, 3063, 4090\*, 4100, 4720\*, 4771, 4772, 4773, 4774, 4900\*

Agricultural Sciences .....

Required course: AGECE 1020, 3860

Other math/science courses.....

Required courses: LIFE 1010\* (PN), 2022\*; CHEM 1000 (PN), ANSC 2010 or CHEM 2300, MATH 1400 (Q); Stat 2050 or 2070

Other communication courses.....

ENGL 1010\* (COM1) and a COM2 course

Other University Studies courses .....

First-Year Seminar\* (FYS), 2 courses in Human Culture (H), and U.S. and Wyoming Constitutions (V)

Suggested courses.....

FDSC 3061; FCSC 1141

**Required credits 128\*\***

\*A grade of C or better must be earned in these courses for successful completion of degree.

\*\*Required credits: 128 total credit hours, 42 credit hours or more at the 3000-level or above.

**Pre-Veterinary Medicine Option**

This option is especially designed to prepare students for application to colleges of veterinary medicine. There is a strong emphasis on the biological, biomedical and physical sciences. This curriculum is also appropriate for students wishing to pursue graduate school opportunities, other professional school applications, or careers in many areas of agribusiness. A minimum of three years of formal course work is required before one can apply to a college of veterinary medicine. Students accepted before completion of their B.S. degree can transfer credits back to UW to complete their degree requirements. Wyoming does not have a college of veterinary medicine. Faculty advisers insure that students meet the variable preveterinary requirements for application to colleges of veterinary medicine in their home state or region.

Animal and Veterinary Science.....	
Required courses: ANSC 3010*, 3100*, 4120*; one course selected from ANSC 3150, 4220 or 4230; PATB 4110*, 4400, 4500, 4710	
Agricultural Sciences .....	
Required courses: MICR/MOLB 2021, 2220; MOLB 3610	
Other math/science courses .....	
Required courses: LIFE 1010* (PN), 2022*, 3050; CHEM 1020 (PN), 1030, 2420, 2400; PHYS 1110, 1120; MATH 1400 (Q), 1405 (Q); STAT 2050 or 2070	
Other communication courses.....	
ENGL 1010* (COM1), a COM2* course, ANSC 4630* (COM3) or other COM3* course	
Suggested courses .....	
ANSC 4050, 4132, 4150, 4260, 4540; FDSC 3060; PATB 4001, 4130, 4170, 4360; ANSC/PATB 4111	
Other University Studies courses .....	
First-Year Seminar* (FYS), 2 courses in Human Culture (H), and U.S. and Wyoming Constitutions (V)	

**Required credits 128\*\***

\*A grade of C or better must be earned in these courses for successful completion of degree.

\*\*Required credits: 128 total credit hours, 42 credit hours or more at the 3000-level or above.

**Equine Science Option**

This option provides a strong background in equine production and management. Students interested in equine should enroll in this option.

Animal and Veterinary Science.....	
Required courses: ANSC 1010, 1030, 3010*, 3100*, 3150*, 3250, 4120, 4132, 4250*, 4540*, 4630* (COM3); ANSC/PATB 4111*	
Agricultural Sciences .....	
Required courses: FDSC 2040; AGE 2020; REWM 2000	
Horsemanship .....	
2 advisor/department head approved courses	
Other math/science courses .....	
Required courses: LIFE 1010* (PN), 2022*, 3050; CHEM 1000 (PN), ANSC 2010 or CHEM 2300, MATH 1400 (Q); STAT 2050 or 2070	
Other communication courses.....	
ENGL 1010* (COM1) and a COM2 course	
Other University Studies courses .....	
First-Year Seminar* (FYS), 2 courses in Human Culture (H), and U.S. and Wyoming Constitutions (V)	

**Required credits 128\*\***

\*A grade of C or better must be earned in these courses for successful completion of degree.

\*\*Required credits: 128 total credit hours, 42 credit hours or more at the 3000-level or above.

**Agriculture Education with Concurrent Major in Animal and Veterinary Science**

This program consists of 128 total hours. Minimum 2.75 cumulative GPA and minimum 2.5 content GPA required. This major will be advised in the College of Education with a secondary adviser in Animal Science. Refer to the College of Education for specific curriculum requirements.

**Undergraduate Minor**

The Departments of Animal Science and Veterinary Sciences offer a minor in animal and veterinary science for non-majors. The courses required for a minor must be taken for a letter grade and the student must receive a grade of C or better in each course. Courses required are: ANSC 3010, 3100, 4120, 4540; FDSC 3060; PATB 4110 and at least one of the following: ANSC 3150, 4220 or 4230. The Department of Animal Science or Veterinary Sciences undergraduate minor adviser may be contacted by students needing assistance or having questions.

**Graduate Study**

The Departments of Animal Science and Veterinary Science offer programs leading to the M.S. (Plan A and Plan B) and Ph.D. degrees in animal and veterinary science. A M.S. degree in food science and human nutrition is offered in cooperation with the Department of Family and Consumer Sciences. The Department of Animal Science also participates in the interdisciplinary M.S./Ph.D. Reproductive Biology Program which has morphed into Biomedical Science Program.

**Program Specific Degree Requirements**

**Master's Program - Plan A (thesis)**

The student, major professor, and graduate committee determine the program of study and research project, which meets the needs of the individual student. The candidate's graduate committee should be established and functioning by the time the student has completed 12 semester hours of formal coursework. The master of science program should be approved and filed by the end of the student's second semester of graduate study in animal science. This committee shall also determine if the student is making satisfactory progress to be advanced to a candidate for a master's

degree or continued in a doctoral program by the end of the student's third semester following matriculation.

The student can specialize in breeding, food science and human nutrition, nutrition, physiology, meat science, reproduction or wool for coursework and thesis/dissertation project. In addition, supporting coursework is available in agricultural economics, biochemistry, microbiology, range management, genetics, statistics, and other areas of interest to the individual. In certain cases it is possible to develop a joint research project between animal science and another department.

Students may use the research facilities and herds of beef cattle, sheep, and swine at the university livestock center near the university or at one of the university research and extension centers in the state. Research laboratories are located on campus and include a modern meat processing facility.

The Plan A program is a 30 hour program, 26 hours of coursework and 4 hours of thesis research.

**Master's Program - Plan B (non-thesis)**

The Plan B program requires a coursework-intensive, non-thesis master of science program for those students whose career paths may not require a thesis research program.

The program requires 32 hours of coursework in addition to an acceptable non-thesis research paper as defined by the student's graduate committee.

**Doctoral Program**

The program requires 72 hours. Students must follow minimum graduate requirements.

**Animal Science (ANSC)**

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB↔Q]).

**1000. Intellectual Community in Animal and Veterinary Sciences. 1. [I,L↔(none)]** Introduction to the field of animal and veterinary science and the purpose and philosophy of higher education. Major issues in the field will be explored through writing and class discussion. The undergraduate curriculum and career options are also discussed. (Offered fall semester)

**1010. Livestock Production. 4.** Scope of industry, management of beef cattle, sheep, dairy cattle, horses, swine and poultry. Introduces breeding and genetics, reproduction and nutri-

tion of domestic animals. Acquaints students with wool, meat, dairy and poultry products. (Normally offered fall semester)

**1030. Equine Management. 3.** An overview of the horse industry and proper way to manage horses. (Normally offered spring semester)

**1070. Livestock Fitting and Showing. 1.** Teaches fitting and showing techniques for domestic livestock. Students will have the opportunity to fit an animal of their choice and participate in the Little International Livestock Show at the Animal Science Livestock Center. (Normally offered fall semester)

**2010. Domestic Animal Metabolism. 3.** Integrates cellular and whole-animal metabolism through introduction to metabolic regulation. Introduces students to the nomenclature, structures and functions of cellular metabolites and vitamins. Knowledge of chemical structure will be applied to cellular reactions in various tissues of domestic animals. Ruminants and non-ruminants will be contrasted. *Prerequisite:* CHEM 1000. (Normally offered spring semester)

**2020. Feeds and Feeding. 4.** Nutrient classification and use, feed value, ration formulation and feeding domestic animals. (Normally offered spring semester)

**2035. Companion Animal Nutrition. 3.** Nutrition and biology of digestion of companion/pet animals. Fundamentals of nutrition and the nutrients, as well as appropriate terminology will be covered, with direct application to companion animals. (Offered spring semester)

**3010. Comparative Anatomy and Physiology of Domestic Animals. 4.** Teaches comparative anatomy and physiology of digestion, circulation, production, reproduction and environment of farm animals. *Prerequisites:* LIFE 1010 and 2022 with a minimum grade of C. (Normally offered spring semester)

**3100. Principles of Animal Nutrition. 3.** Description of the nutrients, nutrient digestion and absorption, and nutrient function within the body of various domesticated animals. *Prerequisite:* CHEM 2300 or ANSC 2010. (Normally offered spring semester)

**3150. Equine Nutrition and Physiology. 3.** Provides general knowledge of nutrition, physiology and biochemistry of exercise and reproductive processes of equine. *Prerequisite:* 4 hours of biology. (Normally offered fall semester)

**3250. Equine Behavior and Welfare. 3.** To familiarize students with an equine interest about behavior, learning, and welfare issues associated with management and training of equine. *Prerequisites:* ANSC 1030, ANSC 3150.

**3550. Livestock Judging. 1-2 (Max. 6).** Livestock judging only. Students representing the university in national and regional contests are selected from this course. Requires field trips. *Prerequisite:* 6 hours in animal science.

**3555. Equine Evaluation and Selection. 2 (Max. 6).** Objectively evaluate equine for performance and breeding purposes according to breed standards and or discipline. Emphasis will be placed on learning how conformation relates to overall function and longevity of equine. Competitive horse judging team criteria will be used to build organizational skills, equine terminology, and communication skills. *Prerequisites:* ANSC 1010 and ANSC 1030.

**3560. Advanced Equine Evaluation and Selection. 2 (Max. 6).** Objectively evaluate equine for halter and performance according to breed standards and or discipline. Competitive horse judging team criteria will be used to build organizational skills, equine terminology, and communication skills. Students will compete as members of the Collegiate Horse Judging Team and represent University of Wyoming at national horse judging competitions. *Prerequisites:* ANSC 3555.

**3650. Exploring Graduate Study in Animal Science. 1.** Gives undergraduates the opportunity to explore graduate studies in Animal Science. Discussions center on graduate program searches, applications, and interviews as well as graduate student responsibilities and career possibilities. Undergraduates are paired with graduate student mentors, participate in data collection, and attend departmental seminars. *Prerequisites:* consent of instructor, junior standing and 3.0 GPA or higher recommended.

**4050. Animal Growth and Development. 3.** Explores aspects of animal growth and development, with a focus on skeletal muscle, adipose, soft connective tissues, and bone. Addresses genetic, endocrine, nutritional, and environmental impacts on tissue development and growth. Dual listed with ANSC 5050. *Prerequisite:* LIFE 2022.

**4061. Cell Signaling. 3.** Cell signaling pathways in animal growth and development. Defines how cells respond to external stimuli. Includes: G-protein couple signaling, calcium signaling, growth factor associated signaling, redox signaling, lipid related signaling, and apoptosis. Dual listed with ANSC 5061. *Prerequisites:* MOLB 3610 or an equivalent biochemistry or cell biology course. (Normally offered fall semester)

**4100. Nutritional Management. 3.** Integration and application of the principles of nutrition. Addresses nutrient requirements, feed composition and nutritional value, in addition

to feeding management strategies for various classes of farm animals. Provides practical nutritional experience through laboratory. Dual listed with ANSC 5100. *Prerequisite:* ANSC 3100. (Normally offered fall semester)

**4111. Equine Health and Disease. 3.** To familiarize students with identification, prevention and treatment of diseases in horses through proper health management techniques. Dual listed with ANSC 5111. Cross listed with PATB 4111. *Prerequisites:* ANSC 1030, ANSC 3150.

**4120. Principles of Mammalian Reproduction. 3.** Overview of the anatomy, physiology, endocrinology and biochemistry of reproductive processes in male and female mammals. Dual listed with ANSC 5120. *Prerequisite:* a course in systemic anatomy and physiology/endocrinology. (Normally offered fall and spring semesters)

**4130. Management of Reproduction. 3.** Lecture-laboratory course. Introduces methods of manipulating reproduction within livestock management systems. Includes artificial insemination, diagnosis of pregnancy, induction and control of estrus and ovulation, induction of parturition, embryo transfer and control and prevention of diseases. *Prerequisite:* ANSC 4120. (Normally offered spring semester)

**4132. Equine Reproduction. 2.** Introduces methods of manipulating reproduction within equine management systems. Includes artificial insemination, diagnosis of pregnancy, induction and control of estrus and ovulation, parturition, embryo transfer, and control and prevention of equine reproductive diseases. *Prerequisites:* ANSC 4120 and ANSC 3150. (Normally offered spring semester)

**4150. Physiology of Ruminant Digestion. 3.** Anatomical structure, function and symbiotic relationship of ruminant digestive system. Dual listed with ANSC 5150. *Prerequisite:* ANSC 3100. (Normally offered spring semester)

**4210. Wool Structures and Properties. 2.** Chemical structure and reactions of wool fiber, as well as physical properties as related to structure. *Prerequisite:* CHEM 2300 or equivalent. (Offered based on sufficient demand and resources)

**4220. Advanced Beef Production and Management. 3.** Integrates animal breeding, nutrition and reproductive physiology in beef production management schemes. Emphasizes analysis and decision making. Consists of two hours of lecture and two hours of lab, with approximately one-half of labs meeting at Animal Science Livestock Center. *Prerequisites:* ANSC 3100, 4120, 4540. (Normally offered spring semester)

**4230. Advanced Sheep Production Management. 3.** Integrates animal breeding, nutrition and reproductive physiology in sheep production management schemes. *Prerequisites:* ANSC 3100, 4120, 4540. (Normally offered spring semester)

**4240 [3330]. Advanced Swine Production and Management. 3.** Integrates animal breeding, nutrition and reproductive physiology in swine production management schemes. Consists of two hours of lecture and two hours of lab, with at least one-half of labs meeting at Animal Science Livestock Center. *Prerequisites:* ANSC 3100, 4120, or 4540. (Normally offered fall semester)

**4250. Advanced Equine Production and Management. 3.** A capstone course for students wanting to pursue a career in the equine industry with main focus on equine management. Business applications, health, facilities, and management will be explored in depth. Integrates equine breeding, nutrition, and reproductive physiology in equine production management schemes. *Prerequisites:* ANSC 1030 and 3150. (Normally offered spring semester)

**4260. Mammalian Endocrinology. 3.** Introduces principles of endocrinology, role of endocrine systems in regulating metabolism, growth, reproduction and lactation in mammals. Dual listed with ANSC 5260. *Prerequisite:* ANSC 3010, ZOO 2110 or 4220. (Normally offered spring semester)

**4500. Problems in Animal Science. 1-3 (Max. 6).** Provides opportunity for students to conduct supervised research in breeding, genetics, management, nutrition and physiology. *Prerequisites:* 6 hours in animal science and consent of instructor. (Offered fall, spring and summer)

**4540. Principles of Animal Breeding. 3.** Discusses genetic principles underlying animal improvement; introductory population genetics; heritability; systems of mating; and selection. Dual listed with ANSC 5540. *Prerequisites:* MATH 1000 or a statistics course; LIFE 3050. (Normally offered fall semester)

**4550. Internship in Animal Science. 1-8 (Max. 8).** Provides opportunities to acquire experience in a field of interest to the student. Offers learning experiences that are difficult, if not impossible, to realize in classroom settings. Following off-campus educational experience, students are more able to evaluate potential career opportunities and select additional classes on-campus to complement career direction. Offered S/U grade only. *Prerequisites:* sophomore standing; 2.5 GPA. (Offered fall, spring and summer)

**4630. Topics and Issues in Animal Science. 3. [WC◀COM3]** Writing-intensive course that focuses on writing projects related to current topics and issues in animal science. Emphasizes writing skills, strategies, information gathering and critical judgment. Assignments include short and long papers, resumes, letters of transmittal, and oral presentations. *Prerequisites:* senior standing and completion of WA and WB writing requirements. (Offered spring semester)

**4700. Behavior of Domestic Animals. 2.** Applied ethology emphasizing the behavioral biology of domestic and companion animals with a concentration on causes and treatments of unwanted behaviors. Ethological approaches include evolutionary, genetic, neural, and hormonal considerations. The foundations of classical and operant conditioning are discussed in relation to behavior modification techniques. *Prerequisites:* LIFE 2022 or equivalent; ANSC 3010.

**4900. Undergraduate Teaching Practicum. 1-2 (Max. 4).** Participation of undergraduates in the teaching of ANSC or FDSC courses under the supervision of ANSC faculty/staff. Offered Satisfactory/Unsatisfactory only. *Prerequisites:* junior standing and consent of instructor.

**5050. Animal Growth and Development. 3.** Explores aspects of animal growth and development, with a focus on skeletal muscle, adipose, soft connective tissues, and bone. Addresses genetic, endocrine, nutritional, and environmental impacts on tissue development and growth. Dual listed with ANSC 4050. *Prerequisite:* LIFE 2022.

**5061. Cell Signaling. 3.** Cell signaling pathways in animal growth and development. Defines how cells respond to external stimuli. Includes: G-protein couple signaling, calcium signaling, growth factor associated signaling, redox signaling, lipid related signaling, and apoptosis. Dual listed with ANSC 4061. *Prerequisite:* MOLB 3610 or an equivalent biochemistry or cell biology course.

**5100. Nutritional Management. 3.** Integration and application of the principles of nutrition. Addresses nutrient requirements, feed composition and nutritional value, in addition to feeding management strategies for various classes of farm animals. Provides practical nutritional experience through laboratory. Dual listed with ANSC 4100. *Prerequisite:* ANSC 3100. (Normally offered fall semester)

**5111. Equine Health and Disease. 3.** To familiarize students with identification, prevention and treatment of diseases in horses

through proper health management techniques. Dual listed with ANSC 4111. Cross listed with PATB 5111. *Prerequisites:* ANSC 1030, ANSC 3150.

**5120. Principles of Mammalian Reproduction. 4.** In addition to attendance in the lecture component of this course, graduate students will be expected to participate in in-depth weekly discussions of the scientific literature and to prepare a research grant proposal on a specific topic. Dual listed with ANSC 4120. *Prerequisite:* a course in systemic anatomy and physiology or consent of instructor.

**5150. Physiology of Ruminant Digestion. 3.** The anatomical structure, function, and symbiotic relationship of the ruminant digestive system. Dual listed with ANSC 4150. *Prerequisite:* ANSC 3100.

**5170. Feed and Food Analysis. 3.** A lecture-laboratory course designed to provide students in animal science, food science and nutrition with instruction and hands-on experience with proximate analysis and instrumentation used for nutrient analysis of foods and feedstuffs as well as discussion of sampling, dilutions, and calculations. Cross listed with FDSC 5170. *Prerequisite:* 6 credits in chemistry or biochemistry, or consent of instructor.

**5180. SAS Applications in Agriculture. 2.** Use of PC Statistical Analysis (SAS) software for analysis of data generated using experimental designs common to the agricultural sciences. Course will emphasize applied programming and interpretation of results. *Prerequisite:* STAT 5080 or equivalent.

**5260. Mammalian Endocrinology. 3.** Introduction to the principles of endocrinology. The role of endocrine systems in regulating metabolism, growth, reproduction, and lactation in mammals are discussed. Dual listed with ANSC 4260. *Prerequisite:* ANSC 3010. (Normally offered spring semester)

**5510. Mineral Metabolism. 3.** Lectures on current mineral nutrition topics with student reports on recent journal articles. *Prerequisite:* ANSC 3100.

**5530. Topics in Range Nutrition. 3.** Lectures on current range nutrition topics with student reports on recent journal articles. *Prerequisite:* ANSC 3100 and consent of instructor.

**5540. Principles of Animal Breeding. 3.** Discusses genetic principles underlying animal improvement; introductory population genetics; heritability; systems of mating; and selection. Dual listed with ANSC 4540. *Prerequisites:* MATH 1000 or a statistics course; LIFE 3050. (Normally offered fall semester)

**5550. Investigations in Animal Nutrition. 2-3 (Max. 6).** Special problems involving nutritional research with domestic or laboratory animals. *Prerequisite:* ANSC 3100 and consent of instructor.

**5620. Wool Measurement Methods. 3.** Theory and practice relating to routine and standard analytical fiber measurements. *Prerequisite:* ANSC 3040 and STAT 2050 or consent of instructor.

**5680. Wool Problems Analysis. 1-5 (Max. 10).** Scientific papers on assigned topics. *Prerequisite:* STAT 2050.

**5770. Lipid Metabolism. 3.** An in-depth study of lipid metabolism and regulation of genes and enzymes involved in transport, synthesis, mobilization, and oxidation of lipids with application to ruminant and non-ruminant species as well as to humans. Cross listed with FDSC 5770. *Prerequisite:* ANSC 3100 or MOLB 3610 or FCSC 4145.

**5780. Investigations in Animal Breeding. 1-3 (Max. 6).** Assigned problems involving genetic and physiological research with domestic or laboratory animals. *Prerequisite:* ANSC 4550.

**5790. Investigations in Animal Physiology. 2-3 (Max. 6).** Special problems involving reproductive physiology or other physiology research with domestic or laboratory animals. *Prerequisite:* ANSC 3010, 4120 and consent of instructor.

**5865. Advanced Seminar in Nutrition. 1-2 (Max. 2).** Preparation and presentation of seminars on a variety of topics relating to animal nutrition, metabolism, and livestock production. *Prerequisites:* graduate standing.

**5870. Reproductive Biology Seminar. 1 (Max. 12).** A graduate seminar designed to examine a variety of topics relating to the physiological processes of reproduction in mammals. *Prerequisite:* graduate standing.

**5880. Advanced Topics. 1-3 (Max. 6).** Special topics will be offered based on interest of students and faculty. Credit hours are variable 1-3 and are repeatable. *Prerequisite:* graduate standing.

**5890. Advanced Seminar. 1-2 (Max. 6).** Preparation, presentation, and discussion of assigned reports. Invitational lectures by visiting guests.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: Credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrolled in a graduate degree program.

**5961. Graduate Project. 1-4 (Max. 4).** Limited to those students enrolled in a Plan B graduate program. Students should be involved in non-course scholarly activities in support of the Plan B project. *Prerequisites:* must be enrolled in Plan B program and have departmental approval.

**5980. Dissertation Research. 1-12 (Max. 48).** Graduate level course designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

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## Food Science

Food science is the application of basic sciences to the processing, quality control, storage, distribution and consumer use of food products. The microbiological, chemical and physical characteristics of foods as related to food processing and product quality are studied. Major emphasis is placed in the area of animal food products.

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## Food Science (FDSC)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

**1101. First-Year Seminar. 3. [(none)▶FYS]**

**1410. Food and Our Well Being. 3.** Introductory course dealing with current questions and concerns about foods. Considers food composition, effects of food processing, food labeling, diet, degenerate diseases and general health. Students become familiar with foods and food industry. (Normally offered spring semester)

**1490. Safety of Our Food. 4.** For students interested in knowing what makes a food, the most basic necessity of life, safe or unsafe. This

will be explored through discussions on factors that make a food safe or unsafe, risk-benefit concepts, the real safety issues and the role of regulatory agencies and consumers to ensure safety of food. When possible, outside experts will be invited to give their views during which students will be encouraged to discuss the issues. Laboratory is required. Course credit cannot be applied toward degree requirements in food science. (Offered once a year)

**2040. Principles of Meat Animal Evaluation. 3.** Live animal and carcass evaluation of beef, sheep and swine. Slaughter, meat inspection and anatomy are discussed. (Normally offered fall semester)

**3060. Principles of Meat Science. 3.** Fabrication of carcasses into cuts and associated processing techniques; muscle growth, structure and metabolism; conversion of muscle into meat; fresh meat properties and quality; chemical properties of meat; meat microbiology, preservation and storage; meat by-products; HACCP. *Prerequisites:* CHEM 1000 and LIFE 1010.

**3061. Livestock Slaughter Practicum. 1.** Students learn and practice proper techniques of livestock slaughter. *Prerequisite:* FDSC 3060 or concurrent enrollment.

**3062. Carcass Fabrication Practicum. 1.** Students learn and practice proper techniques of carcass fabrication. *Prerequisite:* FDSC 3060 or concurrent enrollment.

**3063. Meat Processing Practicum. 1.** Students learn and practice proper procedures for the production of sausages and cured meat products. *Prerequisite:* FDSC 3060 or concurrent registration.

**3550 [2100]. Meat Evaluation. 1-2 (Max. 6).** USDA grading standards, value pricing, yield and quality attributes of meat are used to evaluate products. Students who represent the university in national and regional contests are selected for this class. Requires field trips. *Prerequisites:* FDSC 2040 or 6 credits in ANSC/FDSC.

**4090. Food Microbiology. 3.** Discusses microorganisms and theory of their growth and survival in relation to spoilage and preservation of foods and health hazards in foods. Dual listed with FDSC 5090; cross listed with MICR 4090. *Prerequisite:* MOLB 2210. (Normally offered spring semester)

**4100 [610]. Laboratory Techniques in Food Microbiology. 1.** Lab techniques used in food microbiology. Dual listed with FDSC 5100; cross listed with MICR 4100. *Prerequisite:* FDSC 4090 or 5090, taken concurrently. (Normally offered spring semester)

**4720. Food Chemistry. 3.** Studies chemical composition of foods and food products. Emphasizes processing and storage. Dual listed with FDSC 5720. *Prerequisite:* CHEM 2300. (Normally offered fall semester)

**4771. Muscle Structure and Function. 1.** Explores properties of skeletal muscle with emphasis on cellular and extracellular proteins, ultrastructure and function. *Prerequisite:* FDSC 3060 or equivalent.

**4772. Conversion of Muscle to Meat. 1.** Explores molecular and biochemical changes in postmortem muscle and their impact on meat quality. *Prerequisite:* FDSC 3060 or equivalent.

**4773. Advanced Meat Processing. 1.** Explores chemical and physical properties of meat and non-meat ingredients and their effect on meat processing. *Prerequisite:* FDSC 3060 or equivalent.

**4774. Advanced Concepts in Meat Microbiology. 1.** Explores spoilage and pathogenic microorganisms in meat products, including shedding, virulence, resistance, and detection methods. *Prerequisite:* FDSC 3060 or equivalent.

**4800. Problems in Food Science. 1-3 (Max. 6).** Examines special problems related to quality control, formulation and processing of meat, poultry and dairy foods. Offers research techniques and instrumentation in foods. *Prerequisites:* 6 hours in FDSC, 6 hours in chemistry and consent of instructor. (Offered fall, spring and summer)

**4900. Food Safety. 3.** Issue-oriented lecture/discussion course. Includes topics such as what is safe food, what makes food unsafe and how safety of a food is determined. Presents laws and regulations on food safety. In addition to a text, area experts are invited to discuss important issues. *Prerequisite:* 6 hours of biological science. (Offered fall semester of odd-numbered years)

**5090. Food Microbiology. 3.** Discusses microorganisms and theory of their growth and survival in relation to spoilage and preservation of foods and health hazards in foods. Dual listed with FDSC 4090. *Prerequisite:* MOLB 2210.

**5100. Food Microbiology Laboratory. 1.** Laboratory techniques used in food microbiology. Dual listed with FDSC 4100. *Prerequisite:* FDSC 4090 or 5090, taken concurrently.

**5170. Food Analysis. 3.** A lecture-laboratory course designed to provide students in animal science, food science and nutrition with instruction and hands-on experience with proximate analysis and instrumentation used for nutrient analysis of foods and foodstuffs as well as discussion of sampling, dilutions,

and calculations. Cross listed with ANSC 5170. *Prerequisite:* six credits in chemistry or biochemistry.

**5220. Techniques of Food Science. 3.** A laboratory course designed to introduce undergraduate and graduate students to sophisticated techniques used in food science research. *Prerequisites:* one semester of graduate study and consent of instructors.

**5720. Food Chemistry. 3.** A study of the chemical composition of foods and food products with emphasis upon processing and storage. Dual listed with FDSC 4720. *Prerequisite:* CHEM 2300.

**5770. Lipid Metabolism. 3.** An in-depth study of lipid metabolism and regulation of genes and enzymes involved in transport, synthesis, mobilization, and oxidation of lipids with application to ruminant and non-ruminant species as well as to humans. Cross listed with FDSC 5770. *Prerequisite:* ANSC 3100 or MOLB 3610 or FCSC 4145.

**5771. Muscle Structure and Function. 1.** Explores properties of skeletal muscle with emphasis on cellular and extracellular proteins, ultrastructure and function. Dual listed with FDSC 4771. *Prerequisite:* FDSC 3060 or equivalent.

**5772. Conversion of Muscle to Meat. 1.** Explores molecular and biochemical changes in postmortem muscle and their impact on meat quality. Dual listed with FDSC 4772. *Prerequisite:* FDSC 3060 or equivalent.

**5773. Advanced Meat Processing. 1.** Explores chemical and physical properties of meat and non-meat ingredients and their effect on meat processing. Dual listed with FDSC 4773. *Prerequisite:* FDSC 3060 or equivalent.

**5774. Advanced Concepts in Meat Microbiology. 1.** Explores spoilage and pathogenic microorganisms in meat products, including shedding, virulence, resistance, and detection methods. Dual listed with FDSC 4774. *Prerequisite:* FDSC 3060 or equivalent.

**5880. Advanced Problems and Topics. 1-3 (Max 6).** Designed to allow graduate students to pursue advanced research problems and advanced topics and to obtain experience in the teaching process. *Prerequisite:* graduate standing and consent of instructor.

**5890. Seminar in Food Science and Nutrition. 1.** A seminar course on topics in food science and human nutrition. Dual listed with FDSC 4890. *Prerequisite:* graduate standing.

**5900. Practicum in College Teaching. 1-3 (Max 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may NOT be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisites:* enrolled in a graduate degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

The Department of Veterinary Sciences section, including Pathobiology course offerings begins on page 143.

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## Department of Ecosystem Science and Management

2013 Agriculture Building, 766-2263

FAX: (307) 766-6403

Web site: [uwyo.edu/esm](http://uwyo.edu/esm)

Department Head: John A. Tanaka

### Professors:

**ANN L. HILD**, B.A. University of Iowa 1975; M.S. Texas Tech University 1991; Ph.D. 1995; Professor of Rangeland Ecology and Watershed Management 2008, 1996.

**DAVID E. LEGG**, B.S. University of Missouri 1978; M.S. 1980; Ph.D. University of Minnesota 1983; Professor of Entomology 2003, 1988.

**KATTA J. REDDY**, B.S. A.P. Agricultural University (India) 1978; M.S. 1980; Ph.D. Colorado State University 1986; Professor of Water Quality 2006, 2000.

**SCOTT R. SHAW**, B.S. Michigan State University 1977; M.S. University of Maryland 1981; Ph.D. 1984; Professor of Entomology 1998, 1989.

**PETER D. STAHL**, B.S. Oklahoma State University 1978; M.S. University of Wyoming 1982; Ph.D. 1989; Professor of Restoration Ecology 2009, 2000; Director, Wyoming Reclamation and Restoration Center.

**JOHN A. TANAKA**, B.S. Oregon State University 1978; M.S. 1982; Ph.D. Utah State University 1986; Professor of Rangeland Ecology and Watershed Management 2009.

**DAVID G. WILLIAMS**, B.A. University of Texas 1985; M.S. Texas A&M University 1988; Ph.D. Washington State University 1992; Professor of Rangeland Ecology and Watershed Management 2009, 2002.

#### Associate Professors:

**JEFFREY L. BECK**, B.S. Brigham Young University 1993; M.S. 1996; Ph.D. University of Idaho 2003; Associate Professor of Rangeland Ecology and Watershed Management 2013, 2007.

**TIMOTHY R. COLLIER**, B.S. University of California—Riverside 1987; Ph.D. University of California—Santa Barbara 1994; Associate Professor of Entomology 2008, 2002.

**ALEXANDRE V. LATCHININSKY**, B.S. St. Petersburg State University (Russia) 1979; M.S. 1980; Ph.D. University of Wyoming 2001; Associate Professor of Entomology 2008, 2003.

**SCOTT N. MILLER**, B.S. Brown University 1991; M.S. University of Arizona 1995; Ph.D. 2002; Associate Professor of Rangeland Ecology and Watershed Management 2008, 2002.

**JAY B. NORTON**, B.S. University of Montana 1985; M.S. Iowa State University 1996; Ph.D. University of Montana 2000; Associate Professor of Soil Science 2012.

**VIRGINIA B. PAIGE**, B.A. Colorado College 1984; M.S. University of Massachusetts 1992; Ph.D. University of Arizona 2000; Associate Professor Rangeland Ecology and Watershed management 2009, 2004.

**J. DANIEL RODGERS**, B.S. East Texas State University 1963; M.S. Texas Tech University 1966; Ph.D. Utah State University 1980; Associate Professor of Rangeland Ecology and Watershed Management 1980.

**THIJS KELLEENERS**, B.S. Wageningen University, The Netherlands 1988; M.S. 1993; Ph.D. 2001. Associate Professor 2012.

**JAMES W. WAGGONER, JR.**, B.S. New Mexico State University 1970; M.S. 1972; Ph.D. University of Illinois 1975; Associate Professor of Rangeland Ecology and Watershed Management 1994.

#### Assistant Professors:

**KRISTINA HUFFORD**, Assistant Professor of Rangeland Ecology and Watershed Management 2010.

**MELANIE MURPHY**, B.S. University of Idaho 1998; M.S. 2001; Ph.D. Washington State University 2008; Assistant Professor of Rangeland Ecology and Watershed Management 2010.

**J. DEREK SCASTA**, B.S. Texas A&M University 2004; M.S. 2008; Ph.D. Oklahoma State University 2014; Assistant Professor of Rangeland Ecology and Watershed Management 2014.

**KAREN L. VAUGHAN**, B.S. University of Delaware-Newark 2001; M.S. University of Maryland-College Park 2004; Ph.D. University of Idaho-Moscow 2008; Assistant Professor of Pedology 2015.

**MENGQIANG ZHU**, B.E. North China Electric Power University 2002; M.S. Chinese Academy of Sciences 2005; Ph.D. University of Delaware 2010; Assistant Professor of Soil and Environmental Biogeochemistry 2013.

#### Academic Professionals:

**CRAIG COOK**, B.S. University of Utah 1978; Assistant Research Scientist, Stable Isotope Facility Manager.

**RACHEL D. MEALOR**, B.S. University of Wyoming 2004; M.S. 2007; Assistant University Extension Coordinator 2007.

**SCOTT SCHELL**, B.S. University of Wyoming 1991; M.S. 1994; Assistant Extension Entomologist 2005, Associate Research Scientist 2009.

**CALVIN STROM**, Research Scientist 2010.

#### Adjunct Professors:

Justin Derner, Jack Morgan, Brenda Schladweiler, Gerald Schuman, Nancy Shaw, Ramesh Sivanpillai

#### Professors Emeriti:

Robert Heil, William Laycock, John Lloyd, Larry Munn, Richard Olson, Quentin Skinner, Michael Smith, Thomas Thurow, George Vance, James Wangberg, Thomas Wesche, Stephen Williams

The Department of Ecosystem Science and Management offers two programs leading to a Bachelor of Science degree. These are Rangeland Ecology and Watershed Management and Agroecology (an interdepartmental program offered through the Department of Ecosystem Science and Management and the Department of Plant Sciences). The coursework requirements necessary for obtaining an agroecology degree are described in the Department of Plant Sciences section of this publication. Either degree can also be obtained as an affiliate degree in conjunction with the School of Environment and Natural Resources. Six minor degree programs are offered through the department: Insect Biology, Rangeland Ecology and Watershed Management, Soil Science, Agroecology, Forest Resources, and Reclamation and Restoration Ecology.

Obtaining a minor to complement a B.S. major degree program provides credentials and knowledge that can expand career opportunities.

The degree programs reflect the department's diverse expertise in natural resource and agriculture sciences. Students completing degrees offered through the department are well prepared for careers in natural resource management and sustainable agriculture (e.g., range management, watershed management, restoration ecology/reclamation of degraded land, wildlife habitat management, biocontrol/integrated pest management, soil science and various types of environmental consulting) or other science careers.

#### Student Learning Outcomes

The goal of the Department of Ecosystem Science and Management is to provide students with a comprehensive knowledge in several different areas in addition to their specific area of study. These expectations ensure that students may take these learned skills and successfully apply them in their post-graduate endeavors. Assessments in all areas are based on knowledge, skills, and attitude.

These areas include:

Oral communication encompasses all the abilities necessary for effective expression and sharing of information, ideas, and feelings in a format including verbal and nonverbal symbols.

Proficiency in written communication will ensure that students will be able to write for different audiences, from expressive writing to technical writing, using a range of sophistication in language.

Professional behavior involves attaining high standards of behavior and appropriate attitudes, not only through acquiring knowledge and experience, but a lifelong commitment to learning and achievement.

Competency in critical thinking and problem solving will enable students to engage in reasonable, reflective thinking focused on deciding what to believe or do.

Computer and information literacy ensures that students will be viewed as trainable and adaptable in a computerized work environment. Proficiency in this area also enables students to effectively access online information, and skillfully make use of it.

The results in these different areas will aid the department in:

- Planning instructional strategies to address student strengths and weaknesses;
- Evaluating and describing overall student achievement;
- Counseling students for academic and career options; and
- Evaluating the effectiveness of instructional programs.

**Minor in Forest Resources**

The primary goal of the Forest Resources minor degree program is to develop a working knowledge of the processes that influence provision of the key products derived from forest lands. Courses taken in fulfillment of a major degree program will also be able to be applied to a minor degree program.

	<b>Hrs.</b>
Minimum Requirements .....	20
RNEW 2100, SOIL 4150, RNEW 4775, and REWM 4540. Choose one from REWM 3100, REWM 4285, REWM 4700, or GEOG 4420; choose one from GEOG 2550 or REWM 4103; choose one from REWM 2000, ZOO 2450, RNEW 3000, or GEOG 4470.	

**Minor in Reclamation and Restoration Ecology**

This program covers the use of basic and applied ecological concepts to rehabilitate and restore processes and functions to disturbed ecosystems.

	<b>Hrs.</b>
Required Courses .....	14
LIFE 3400, SOIL 2010, REWM 4200, 4580, RNEW 4990	
Planning and Policy (choose one).....	3
AGEC 4710, ENR 3000, GEOG 4040, 4750, REWM 4051, 4052, 4900	
Below-Ground Processes (choose one) .....	3-4
CE 4800, 4820, SOIL 4100, 4120, 4140, 4150, 4160	
Above-Ground Processes (choose one) .....	2-4
BOT 4700, 4111, ENTO 4678, 4685, GEOG 4200, REWM 4285, 4540, 4700, 4710, 4850, ZOO 4550	
<b>Total</b>	<b>22-25</b>

**Graduate Study**

The Department of Ecosystem Science and Management is an interdisciplinary department made up of five disciplinary areas: entomology, rangeland ecology, soil sciences, agroecology, and watershed management. The department offers the master of science and doctor of philosophy degrees in entomology, rangeland ecology and watershed management, and soil science. A water resources dual major may be obtained in conjunction with each of these master’s degrees. For the rangeland ecology and watershed management degrees, thesis and dissertation problems may be developed in aspects of range ecology, wildlife habitat, reclamation of disturbed lands, watershed management, utilization and improvement of rangelands, and many other facets of range and forest ecology management. For the entomology degrees, thesis and dissertation problems may be developed in many areas of basic and applied aspects of insect ecology. For the soil degrees, thesis and dissertation problems may be developed in many basic and applied aspects of soil science. The degree programs reflect the department’s diverse expertise in natural resource and agriculture sciences. Students completing degrees offered through the department are well prepared for careers in natural resource management and sustainable agriculture (e.g., range management, watershed management, restoration ecology/reclamation of degraded land, wildlife habitat management, biocontrol/integrated pest management, soil science and various types of environmental consulting) or other science careers.

A graduate certificate in reclamation and restoration ecology may be obtained after completion of a B.S. degree or in conjunction with an M.S. or Ph.D. degree.

At present, no program for graduate degrees in agroecology is offered; however, some courses at the graduate level are available. Responsibility for this program is shared with the Department of Plant Sciences.

**Program Specific Admission Requirements**

Admission is contingent upon a faculty member being willing to assume responsibility for working with the student as an adviser.

Applicants are encouraged to initiate correspondence with faculty who share similar research interests as part of the process of securing faculty advising commitment.

In special circumstances, and with the faculty adviser’s support, a student may be admitted in a provisional status with continued enrollment dependent upon meeting performance requirements specified at the time of admission.

**Program Specific Graduate Assistantship Information**

Current graduate assistantship availability, subject of study, and remuneration can be determined by checking: www.uwyo.edu/esm. Prospective students are also encouraged to directly correspond about future opportunities for graduate assistantships with faculty that share similar research interests.

**Program Specific Degree Requirements**

*Master of Science in Entomology*

*Plan A (thesis)*

The master of science degree normally is offered under Plan A which requires at least the university minimum degree requirements and an oral examination.

*Plan B (non-thesis)*

Requires 30 hours of graduate credit to include 9 hours of required courses, 11 hours of required electives, and 10 hours of other electives.

Plan B project - follows format of Plan A thesis.

A Plan B master of science will be a terminal degree program in the Department of Ecosystem Science and Management. Students completing this option will not qualify for a subsequent Ph.D. program in Department of Ecosystem Science and Management at the University of Wyoming.

*Master of Science in Entomology/Water Resources*

Please refer to the Water Resources section of this Catalog for degree requirements.

*Master of Science in Rangeland Ecology and Watershed Management*

*Plan A (thesis)*

The master of science degree normally is offered under Plan A which requires at least the university minimum degree requirements and an oral examination.

An oral defense of the thesis is required.



**Plan B (non-thesis)**

Plan B is available under special circumstances and requires 30 hours of graduate coursework.

Plan B candidates must also prepare one professional paper (i.e., content and form compatible with publication in a scientific journal) or, if the adviser requests, two professional papers in selected topic areas.

An oral defense of the paper(s) is required.

**Master of Science in Rangeland Ecology and Watershed Management/Water Resources**

Please refer to Water Resources section of this Catalog for degree requirements.

**Master of Science in Soil Science****Plan A (thesis)**

Plan A requires the university minimum degree requirements and an oral final examination.

**Plan B (non-thesis)**

Plan B is available and requires 30 hours of graduate coursework.

An oral defense of the paper(s) is required.

**Master of Science in Soil Science/Water Resources**

Please refer to the Water Resources section of this Catalog for degree requirements.

**Doctoral Programs****Doctor of Philosophy in Entomology**

Candidates must complete the minimum requirements for the doctor of philosophy degree, plus a preliminary examination (written and oral) covering knowledge related to the discipline (taken after most coursework complete) and an oral final examination.

**Doctor of Philosophy Program in Hydrology**

Water Resources/Environmental Science and Engineering (WRESE) is an Interdisciplinary Ph.D. program that fulfills an important need by organizing a rigorous Ph.D.-level curriculum, with sufficient numbers of relevant, frequently-offered courses to serve the needs of Ph.D. students affiliated with program faculty.

The program's Ph.D.-level coursework is essential and forward-looking in areas such as aquatic chemistry, transport in natural systems, hydrometeorology, land-atmosphere interactions, eco-hydrology, hydrogeology, vadose zone hydrology, hydrologic applications of stable isotopes, limnology, hydrologic model-

ing, hydrological and water quality effects on aquatic organisms, hydroclimatology, hydrologic remote sensing and watershed hydrology.

**Doctor of Philosophy in Rangeland Ecology and Watershed Management**

Candidates must complete the minimum requirements for the doctor of philosophy degree, plus a preliminary examination (written and oral) covering knowledge related to the discipline (taken after most coursework complete) and an oral final examination.

**Doctor of Philosophy in Soil Science**

Candidates must complete the minimum requirements for the doctor of philosophy degree, plus a preliminary examination (written and oral) covering knowledge related to the discipline (taken after most coursework complete) and an oral final examination.

**Doctor of Philosophy in Ecosystem Science and Management/Applied Economics**

The course requirements for the PhD program in Ecosystem Science and Management (ESM) with a concentration in Applied Economics are highly flexible to accommodate a wide variety of student backgrounds and interests. Students can major in any PhD program within ESM including Rangeland Ecology and Watershed Management (REWM), Soil Science (SOIL), and Entomology (ENTO) following the ESM admission procedures. The student's graduate committee, with the approval of the Department Heads and College Dean, determine the final program of study. Acknowledging flexibility, each student's program of study is expected to meet the following minimum requirements:

A minimum of 72 credit hours of coursework. The credit hour requirement can include:

Up to 48 credit hours transferred from approved graduate courses earned while pursuing an M.S. degree (no more than 4 credit hours of thesis);

A minimum of 12 credit hours of approved ESM (REWM, SOIL, ENTO) courses;

A minimum of 18 credit hours of approved AGECE or ECON courses, with at least 12 credit hours at the 5000-level.

At least 42 of the 72 credit hour requirement must be earned in formal coursework.

No more than 12 credit hours of 4000-level courses can count towards the 72 credit hour requirement.

In addition to the degree requirements listed, students pursuing this option will also meet

the following general requirements:

- Enroll in, and complete, the graduate minor in Applied Economics.
- Include co-chairs, one from ESM and one from AGECE, on the graduate committee.
- Participate in a meaningful teaching experience to be coordinated by the student's major professor.
- Complete a preliminary examination covering knowledge related to both ESM and AGECE.
- Present research results at a formal public seminar.
- Complete a final oral examination covering the student's thesis research administered by the graduate committee.

**Graduate Certificate Program****Reclamation/Restoration Ecology Graduate Certificate**

The Reclamation/Restoration Ecology (RRE) graduate certificate prepares the student to use basic and applied ecological concepts to reclaim and/or restore processes and functions to disturbed ecosystems. Reclamation and/or restoration of disturbed ecosystems requires an understanding of the edaphic, biotic, hydrologic, geologic, and topographic factors comprising these ecosystems, including the complex interrelationships that support and perpetuate ecosystem function. The graduate certificate will be granted to students who have completed a B.S. in an appropriate science-oriented discipline or are currently enrolled in an M.S. or Ph.D. program.

The graduate certificate will also be available to professionals working in reclamation/restoration oriented fields seeking to upgrade their training in reclamation and restoration ecology. Those interested in the graduate certificate will be required to complete the coursework listed below as well as write a synopsis paper with a formal presentation advertised as an open forum seminar.

**Required Certificate Courses:**

Reclamation and restoration ecology courses  
 REWM 4200, REWM 5580 ..... 6 hours  
 Reclamation problems  
 SOIL 5565 or REWM 5640..... 4 hours  
 Reclamation process course (choose one)  
 BOT 5700, BOT 5730, BOT 5780, PLNT  
 5070, PLNT 5470, GEOL 5444, GEOL  
 5570, REWM 5280, REWM 5710, RNEW  
 5540, SOIL 5100, SOIL/MATH 5110,  
 SOIL 5120, SOIL 5130, SOIL 5140, SOIL  
 5150, ZOO 5550 ..... 3 hours

Planning/policy courses (choose one)  
ENR 4900, ENR 5900 ..... 3 hours  
Minimum total credits needed: 16 hours

Courses of instruction in the department are offered in agroecology, entomology, rangeland ecology and watershed management, renewable resources, and soil science.

## Ecosystem Science and Management (ESM)

**4990. Topics. 1-4 (Max 8).** Topics pertaining to ecosystem science and natural resource management. Intended to accommodate instruction in various specialized subjects being offered for the first time or not offered on a regular basis. Students may enroll in more than one section of this course provided topics are different. *Prerequisites:* Appropriate to the particular topic will be specified in the course advertisement.

**5995. Topics. 1-4 (Max 8).** Topics pertaining to ecosystem science and natural resource management. Intended to accommodate instruction in various specialized subjects being offered for the first time or not offered on a regular basis. Students may enroll in more than one section of this course provided topics are different. *Prerequisites:* Appropriate to the particular topic will be specified in the course advertisement.

## Renewable Resources (RNEW)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**2100 [BOT 2100]. Forest Management. 3.** Principles of forest management. Topics include the laws affecting forest management, methods of harvesting wood from forests, fire and insect management, the effects of disturbances on stream flow and nutrient cycling, and the challenges of developing management plans for forests. Cross listed with ENR 2100. *Prerequisites:* LIFE 1001 or 1010.

**2345. Natural Resource Ethics. 3. [CH,D♦(none)]** Introduction to ethics in context of natural resource extraction, use, conservation, preservation, and distribution. Ethical frameworks include teleological and deontological theories primarily applied to human needs and wants. Concepts and applications of environmental justice are addressed, including private property, sustainability, and obligations to future generations. Cross listed with ENR/PHIL 2340.

**3000. Tropical Ecology. 3.** Examines the characteristics of tropical ecosystems, how they evolved, their value to humans, their present status, and current issues relating to biodiversity, deforestation, extinction, and conservation. *Prerequisites:* LIFE 1001 or 1010.

**4130. Applied Remote Sensing for Agricultural Management. 3.** Addresses principles and applications of remote sensing to crop and rangeland management. Provides an overview of remote sensing concepts and applications pertaining to crops, shrubs and range vegetation. In laboratory, students will learn to process remotely sensed data for mapping and monitoring crop and rangelands. Cross listed with AECL/BOT 4130; dual listed with RNEW 5130. *Prerequisites:* QA course and 9 credit hours in student's major field and junior/senior standing or permission of instructor.

**4340. Issues: Environmental Ethics. 3.** Encompasses selected topics in environmental and natural resource ethics. Cross listed with PHIL 4340. *Prerequisites:* PHIL 2330, 3300, 3350.

**4400. Invasive Plant Ecology. 3.** Ecological impacts of invasive, non-indigenous plant species, the ecological, genetic and evolutionary hypotheses for invasiveness, as well as management strategies for invasive plant species. Dual listed with RNEW 5400; cross listed with AECL 4400. *Prerequisite:* LIFE 3400.

**4730. Plant Physiological Ecology. 4.** Acquaints advanced students with environmental factors which affect the establishment and growth of plants. Emphasizes adaptive mechanisms. Dual listed with RNEW 5730. Cross listed with BOT 4730. *Prerequisites:* one course in physiology and one course in ecology. (Normally offered spring semester)

**4775. Forest Ecology. 4.** Integrative study of the structure, function, and ecological diversity of forested ecosystems, and the physical factors that influence this diversity, including emergent properties of energy flow and nutrient cycling. Special emphasis is given to understanding forest disturbances and succession, and implications for impacts of management and sustainability are discussed throughout. Cross listed with BOT 4775. *Prerequisite:* LIFE 3400.

**4990. Topics in: \_\_\_\_\_ 1-4 (Max. 8).** Special topics pertaining to renewable natural resource management. Intended to accommodate instruction in various specialized subjects not offered on a regular basis. Students may enroll in more than one section of this course provided topics are different. Dual listed with RNEW 5990. *Prerequisite:* consent of the instructor to pursue study of the topic.

**5130. Applied Remote Sensing for Agricultural Management. 3.** Addresses principles and applications of remote sensing to crop and rangeland management. Provides an overview of remote sensing concepts and applications pertaining to crops, shrubs, and range vegetation. In laboratory, students will learn to process remotely sensed data for mapping and monitoring crop and rangelands. Dual listed with RNEW 4130; cross listed with BOT 5130. *Prerequisites:* QA and 9 hours in student's major field and junior/senior standing.

**5200. Spatial Analysis of Watersheds and Ecosystems. 3.** Covers topics related to analysis of spatial and temporal processes at watershed and ecosystem scales using Geographic Information Systems (GIS). Topics include land classification and suitability analysis interpolation techniques, terrain analysis, model integration, and visualization. Sources of potential error and ramifications are examined. *Prerequisite:* GEOG 4210 or equivalent.

**5400. Invasive Plant Ecology. 3.** Ecological impacts of invasive, non-indigenous plant species, the ecological, genetic and evolutionary hypotheses for invasiveness as well as management strategies for invasive plant species. Dual listed with RNEW 4400; cross listed with AECL 5400. *Prerequisite:* LIFE 3400.

**5500. Stable Isotope Ecology. 3.** Application of stable isotope measurements to organismal and systems ecology. Lectures address the theory underlying the use of stable isotopes at natural abundance levels as tracers and integrators of important physiological and ecological processes. Laboratory exercises provide hands on experience with stable isotope ratio measurements. *Prerequisite:* graduate classification in a natural science or agriculture discipline.

**5540. Shrubland Ecology. 3.** Ecology of shrub-dominated lands and shrub species in grasslands. Location, importance and environmental constraints of shrub distributions. Topics include herbivory, woody plant invasions, competitive interactions, monitoring and population dynamics. Emphasizes familiarity with scientific literature. *Prerequisite:* RNEW 3000, BOT 4700.

**5545. Shrub Ecology Trip. 2.** Field study in North American shrublands of western US ecosystems. Participants learn from researchers, managers, field activities, required readings and written assignments. Participants will be camping and a fee is required. *Prerequisite:* RNEW 5540.

**5730. Plant Physiological Ecology. 4.** Acquaints advanced students with environmental factors which affect the establishment and growth of plants. Emphasizes adaptive

mechanisms. Lecture with inclusive hands-on laboratory. Dual listed with RNEW 4730; cross listed with BOT 4730/5730. *Prerequisite:* one course in physiology and one course in ecology.

**5775. Forest Ecology. 4.** Integrative study of the structure, function, and ecological diversity of forested ecosystems, and the physical factors that influence this diversity, including emergent properties of energy flow and nutrient cycling. Special emphasis is given to understanding forest disturbances and succession, and implications for impacts of management and sustainability are discussed throughout. Dual listed with RNEW 4775; cross listed with BOT 5775 and ECOL 5775. *Prerequisite:* LIFE 3400.

**5959. Enrichment Studies. 1-3 (Max. 3).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5985. Seminar. 1-3 (Max. 3).** Current issues relevant to renewable resources research and management. Offered S/U only. *Prerequisite:* graduate standing.

**5990. Topics In Renewable Resources. 1-4 (Max. 8).** Special topics pertaining to renewable natural resource management. Intended to accommodate instruction in various specialized subjects not offered on a regular basis. Students may enroll in more than one section of this course provided topics are different. Dual listed with RNEW 4990.

## Environment and Natural Resources Affiliate Degrees

Bachelor of Science degrees in either the Agroecology or the Rangeland Ecology and Watershed Management offered through the Ecosystem Science and Management Department may also be obtained as affiliate degrees with the School of Environment and Natural Resources (i.e., the degree titles would be Environment and Natural Resources/Rangeland Ecology and Watershed Management or Environment and Natural Resources/Agroecology). The additional coursework requirements necessary for obtaining an affiliate degree are described in the School of Environment and Natural Resources section of this publication.

## Entomology Minors Programs

Because of the pervasiveness of insects, the entomology minors programs provide a vital link among the life and environmental sciences at the University of Wyoming. Students will be prepared to serve society not just through the vital industry of agriculture, but through

contributions to basic biology, human and animal health, ecosystem management, wild-life conservation and a myriad of other ways.

## Minor in Insect Biology

This minor is intended for students who have an interest in insects as organisms, including their basic biology, ecology and evolution. As insects dominate biological diversity, they are essential to most ecological systems, and have unique physiological systems. Students majoring in zoology, botany, molecular biology, biology or similar fields will find the study of these organisms a rewarding and valuable (if not essential) element of the life sciences.

In terms of biological diversity, at least 75 percent of all species are insects, with over 800,000 known species and another 10-50 million yet to be described. Insects are increasingly used as bioindicators of environmental health. Many industries now recognize that insects may be the world's richest, untapped natural resource, with billions of dollars of unexploited goods and services. Accessing these resources requires trained entomologists. Such training demands an academic setting, such as the University of Wyoming, where collections are maintained, productive faculty are involved in quality research and teaching, the latest methodologies are available and taught, the necessary scientific literature is readily accessible and a curriculum available that allows the student to pursue this field.

Minimum requirements.....13

Choose one from ENTO 1000 or 1001, then choose from ENTO 4678, 4682, 4684, 4686, 4687, and 4884 to meet the minimum 13 credit hour requirement.

## Insect Biology/Entomology Graduate Study

The department offers graduate work leading to the Master of Science and Doctor of Philosophy in entomology and an affiliated graduate option in water resources. Department faculty have active programs in insect ecology (biological control, population biology and plant-insect interactions), systematics (taxonomy, phylogeny and evolution) and pest management (biological control, biometrics and sampling, and pest management on humans, livestock, crops and rangeland).

## Entomology (ENTO)

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).**

**1000. Insect Biology. 3. [SB♦PN]** Introduces insects and related arthropods. Introduces aspects of insect biology, behavior, life history and diversity, as well as many ways that insects affect humans.

**1001. Insect Biology. 4. [SB♦(none)]** Covers same lecture material as ENTO 1000, but includes a laboratory.

**1150. Pesticide Safety and Application. 1.** Introduces various types and safe methods of pesticides application. Subsequent to completion, students may take the certification test administered by the Wyoming Department of Agriculture. Cross listed with CROP 1150. Offered S/U only. (Normally offered the week prior to spring semester)

**4100. Senior Thesis: Proposal Preparation. 1-3 (Max. 6).** Individualized preparation of a research proposal for a senior thesis project. Offered S/U only. *Prerequisite:* senior standing.

**4200. Senior Thesis: Research Project. 1-3 (Max. 6).** Individualized research project based on the senior thesis proposal. Offered S/U only. *Prerequisite:* ENTO 4100.

**4300. Applied Insect Ecology. 3.** Examines concepts of insect ecology and their application to the management of agricultural and rangeland insect pests. Control of rangeland weeds using insects in also examined. Covers population dynamics, predator-prey and insect-plant interactions, biological control and integrated pest management. *Prerequisite:* ENTO 1000 or 9 hours of biology or ecology-related coursework.

**4678. Aquatic Entomology. 3.** Emphasizes biology, ecology, distribution, and taxonomy of aquatic insects. Includes aquatic insects as indicators of pollution. Students must make and identify a collection of immature aquatic insects. Dual listed with ENTO 5678. *Prerequisite:* ENTO 1000, 1001. (Normally offered fall semester of even-numbered years)

**4682. Insect Anatomy and Physiology. 5.** Studies structure and function of the insect body, particularly emphasizing the relationship between anatomical features and their cellular/biochemical functions. Dual listed with ENTO 5682. *Prerequisite:* ENTO 1000. (Normally offered spring semester of even-numbered years)

**4684. Classification of Insects. 4.** Studies insect orders, families and taxonomic treatises. Requires collection of adult insects representing 100 families, or equivalent museum project,

for completion of course requirements. Dual listed with ENTO 5684. *Prerequisite:* ENTO 1000. (Normally offered fall semester of odd-numbered years)

**4686. Problems in Entomology. 1-3 (Max. 6).** Individual library, laboratory or field study of insects. *Prerequisites:* 4 hours of biological science and 3 hours of entomology. (Offered fall, spring and summer semesters)

**4687. Insect Evolution. 3.** Examines major events of insect evolution including origins, fossils, wings and flight, metamorphosis, extinct orders, diversification patterns of modern orders, climate change, plate tectonics, coevolution with plants, parasitism, social behavior, and origin of modern faunas. Dual listed with ENTO 5687. *Prerequisite:* ENTO 4684 required; ENTO 4670, 4682 recommended.

**4852. Senior/Graduate Seminar. 1 (Max. toward B.S. 2; Max. toward M.S. 2; Max. toward Ph.D. 6).** Presentation of results and interpretation of the senior thesis research. Dual listed with ENTO 5852.

**4884. Insect Behavior. 3.** Examines the behavior of insects, including foraging, mating and social behavior. The course focuses on the applied as well as the fundamental aspects of behaviors, and both the strategic and physiological bases of behavior. Dual listed with ENTO 5884. *Prerequisite:* ENTO 1000.

**5080. Statistical Methods for the Agricultural and Natural Resource Sciences. 3.** Brief review of statistical principles. Use of SAS programming. Numerous analysis of variance techniques along with commonly used experimental designs. Multiple mean comparisons, linear contrasts, power of F test, simple linear regression, polynomial regression, analysis of covariance, and some categorical data techniques for student in the agriculture and natural resources sciences. Credit cannot be earned in more than one of the following courses: STAT 2100, 3050, 5050, 5060, 5070, 5080. Cross listed with STAT 5080. *Prerequisite:* STAT 2050 or equivalent.

**5300. Applied Insect Ecology. 3.** Examines concepts of insect ecology and their application to the management of agricultural and rangeland insect pests. Control of rangeland weeds using insects is also examined. Covers population dynamics, predator-prey and insect-plant interactions, biological control and integrated pest management. Dual listed with ENTO 4300. *Prerequisite:* ENTO 1000 or 9 hours of biology or ecology related coursework.

**5601. Insects for Teachers: Collection and Identification of Insects. 1.** Designed for school teachers K-12. Basic concepts such as insect classification, insect habitats, insect metamorphosis, and destructive and beneficial

insects are discussed with emphasis on the presentation of these concepts in the school classroom. Half of the class is devoted to field trips, laboratories, workshop activities, and films. Each student will make an insect collection, and learn how to preserve, mount, and identify specimens to order level. Course may be taken independently of ENTO 5602. Identical to NASC 4790. *Prerequisite:* junior standing. Offered summer term only.

**5602. Insects in the Classroom: Insects and Their Ways. 1.** Designed for school teachers K-12. Basic concepts of insect structure and function (insect morphology, insect physiology, insect ecology, and insect behavior) are discussed with emphasis on the presentation of these concepts using living insects in the classroom. Half of the class is devoted to field trips, laboratories, workshop activities, and films. Each student will design, conduct, and write-up an experiment with insects. Course may be taken independently of ENTO 5601. Identical to NASC 4790. *Prerequisite:* junior standing. Offered summer term.

**5678. Aquatic Entomology. 3.** Biology, ecology, distribution and taxonomy of aquatic insects will be emphasized. Additional material covered will include aquatic insects as indicators of pollution. Students must make and identify a collection of immature aquatic insects. Dual listed with ENTO 4678. *Prerequisite:* 1 year of basic biology.

**5682. Insect Physiology. 5.** Structure and function of the insect body, with particular emphasis on the relationship between anatomical features and their cellular/biochemical functions. Dual listed with ENTO 4682. *Prerequisite:* ENTO 1000.

**5684. Classification of Insects. 4.** A study of insect orders, families and taxonomic treatises. Collection of adult insects representing 100 families, or equivalent museum project, is required for completion of course requirements. Dual listed with ENTO 4684. *Prerequisite:* ENTO 1000; ENTO 4670 is recommended.

**5686. Problems in Entomology. 1-3 (Max. 6).** Individual library, laboratory or field study of insects. Dual listed with ENTO 4686. *Prerequisite:* 4 hours of biological science and 3 hours of entomology.

**5687. Insect Evolution. 3.** Examines major events of insect evolution including origins, fossils, wings and flight, metamorphosis, extinct orders, diversification patterns of modern orders, climate change, plate tectonics, coevolution with plants, parasitism, social behavior, and origin of modern faunas. Dual listed with ENTO 4687. *Prerequisite:* ENTO 4684/5684 required. Recommended: ENTO 4670/5670, ENTO 4682/5682.

**5689. Topics in Entomology. 1-4 (Max. 6).** Current topics in entomology taught by entomology faculty, adjunct faculty or visiting faculty. Please check class schedule for current title.

**5850. Research in Entomology. 1-3 (Max. 8).** Individual investigations of particular problems. *Prerequisite:* graduate standing

**5852. Senior/Graduate Seminar. 1 (Max. 6).** Discussion of important contributions to entomology. Dual listed with ENTO 4852. *Prerequisite:* graduate standing.

**5884. Insect Behavior. 3.** Fundamentals of insect behavior and an analysis of behavioral patterns. Dual listed with ENTO 4884. *Prerequisite:* one year of basic biology or equivalent; ENTO 5682 is recommended.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrollment in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Graduate level course designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisites:* enrollment in a graduate level degree program.

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## Agroecology Program

Rooms 50/2013 Agriculture Building

(307) 766-3103/766-2263

Departments of Plant Sciences and Ecosystem Science and Management

The Bachelor of Science degree program in agroecology is an interdepartmental major involving the collaborative teaching, advising and research expertise in the Departments of Plant Sciences and Ecosystem Science and Management. An agroecology minor is

also available. See the Plant Sciences section under the College of Agriculture and Natural Resources for more information on the Agroecology program.

## Rangeland Ecology and Watershed Management Major

Rangeland occupies 47% of the Earth's land area. The 50 million acres of rangeland in Wyoming provide diverse opportunities for the multiple uses of livestock and wildlife grazing, recreation, water production and natural beauty. Students are taught to understand and manage complex rangeland ecosystems.

The rangeland ecology and watershed management curriculum is designed for students choosing to study ecology, utilization and management of rangelands and wildland watersheds and related resources of forestry, recreation, wildlife management, soil science, botany, and zoology. Degrees include Bachelor of Science, Master of Science, and Doctor of Philosophy.

The undergraduate course of study helps students become well prepared for careers in natural resource management (e.g., range management, watershed management, restoration ecology/reclamation of degraded land, wildlife habitat management, ranch management, various types of environmental consulting), or other natural science careers. The curriculum fully meets the Office of Personnel Management (OPM) requirements for Range Conservationist. By appropriate course selection within the elective hours, students will also meet OPM requirements for additional professional work, such as soil conservationist or hydrologist.

### Rangeland Ecology and Watershed Management Graduate Study

Areas of graduate study leading to a M.S. or Ph.D. in rangeland ecology and watershed management include range ecology, animal nutrition, watershed management, wildlife habitat management, restoration ecology, and reclamation of disturbed lands. A graduate certificate in reclamation and restoration ecology and a graduate option in water resources are offered in affiliation with the rangeland ecology and watershed management graduate degree.

## Course Requirements for a Major in Rangeland Ecology and Watershed Management (B.S.)

	Hrs.
REWM .....	37
2000, 2400, 3000, 3100, 4285, 4330, 4530, 4700, 4830, 4850, 4900	
Resource management.....	14-15
SOIL 2010, SOIL 4120, AGECE 4700, and choose one from RNEW 4130, BOT 4111, BOT 3150 or GEOG 4200	
Physical and Natural World.....	8
LIFE 1010 and CHEM 1000	
Biological sciences.....	7
LIFE 2022, 2023, or MICR 2021, LIFE 3400	
Communication skills.....	6
USP Communication 1 and COJO 2010	
Quantitative reasoning.....	7
MATH 1400, STAT 2050	
Human Culture .....	6
Human Culture, AGECE 1020	
First-Year Seminar.....	3
US and WY Government.....	3
Electives .....	28-29
<b>Total</b>	<b>120</b>

### Minor

A minor in rangeland ecology and watershed management is available for students in other majors interested in increasing their knowledge of the field. The number of hours required is 22. The required courses for the minor are: LIFE 1010 (4 hrs.) and 3400 (3); and REWM 2000 (3), 2500 (2), 4330 (3), 4530 (1) and 6 hrs. selected from other REWM upper-division (3000 or 4000 level) courses.

## Rangeland Ecology and Watershed Management (REWM)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB↔Q]).

**2000. Principles of Rangeland Management.** 3. Basic principles of range management as they apply to various regions and vegetative types. Relationship of range management practices to livestock production, wildlife management, forestry, hydrology and other land uses. Introductory course for majors and non-majors. *Prerequisite:* LIFE 1001 or 1010.

**2400 [2500]. Range Ecosystems and Plants.** 4. Ecology of range ecosystems of western North America and identification of 200 most common plants species, including taxonomic keying. *Prerequisite:* REWM 2000 with a grade of C or better.

**3020. Nutritional Management of Grazing Ungulates.** 4. Characterization of grazing animal nutritional needs and foraging behavior; rangeland forages and supplements. Management of animals and forages/feeds to optimize nutrient intake. *Prerequisite:* approved University Studies biological sciences course. (Normally offered fall semester)

**3100. Principles of Wildland Water Quality.** 3. Basic principles of aquatic chemistry and water quality as they relate to watershed management practices including livestock production, agronomic production, mineral and natural gas extraction and other land uses. Cross listed with ENR 3100. *Prerequisite:* CHEM 1000. (Normally offered fall semester)

**3390. Range Judging.** 2. Identification of important range plants based upon specialized morphological characteristics. UW Range Judging Team is selected from this course. *Prerequisite:* C or better in REWM 2000, REWM 2500, REWM 3020. (Normally offered spring semester)

**3500. Rangeland Plant Ecophysiology.** 3. Examines plant physiological processes that have application to ecological and land management issues. Topics include carbon assimilation, water relations, mineral nutrition as applied to plant distributions, plant and system responses to grazing, as well as plant tolerance of extreme conditions including drought, excessive temperatures and changes in climate. *Prerequisite:* LIFE 2022 or 2023. (Normally offered fall semester)

**4000. Poisonous Plants and Plant Toxins.** 3. Plants poisonous to livestock in Wyoming and the Mountain West; identification, ecology, toxic principles, physiologic responses of animals, situations leading to poisoning, control and management to prevent losses. *Prerequisite:* 12 hours of biological and chemical sciences. (Normally offered spring semester)

**4051. Environmental Politics.** 3. [WC↔(none)] Analyzes environmentalism as a political phenomenon. Provides students with a basic understanding of how to analyze political issues by: (1) examining the historical and contemporary issues that produce controversy over environmental matters; and (2) surveying the impacts of these issues on the formulation and implementation of laws, policies, and regulations. Cross listed with AMST, ENR, GEOG and POLS 4051. *Prerequisite:* POLS 1000.

**4052. Federal Land Politics.** 3. Examines the political forces that have shaped and continue to shape federal land policy and management. Explores the interactions between democratic decision making and science in the management of federal lands. Surveys the sources of

controversy over federal land management and methods for harmonizing public demands with technical expertise. Cross listed with POLS/ENR/GEOG/AMST 4052. *Prerequisite:* POLS 1000.

**4103 [3103]. Range and Ranch Recreation.**

**3.** Understanding of public demands for leisure use of public and private rangelands; potential impacts on rangeland resources, ranch practices and families and other rangeland users. Students prepare public range or private ranch recreation operations plan. Graduate students assist in preparation and presentation of lecture. Dual listed with REWM 5103.

*Prerequisites:* C or better in REWM 2000 and CS course. (Normally offered spring semester)

**4150 [3150]. Behavior Modification for Production of Grazing Herbivores. 3.**

Strategies for manipulation of behavior and management of the grazing herbivore will be developed from scientific and practical information. Designed to equip the student to manage for animal and natural resource production. Dual listed with REWM 5150. *Prerequisites:* C or better in REWM 2000 and REWM 3020 or ANSC 3100. (Normally offered spring semester)

**4200. Reclamation of Drastically Disturbed Lands. 3.**

Overviews reclamation of drastically disturbed lands in the west, emphasizing surface mined lands. Includes principles of ecology, agronomy, soils and other relevant disciplines as applied to mitigate adverse environmental impacts of land disturbance. *Prerequisite:* LIFE 3400, AECL 2100. (Normally offered fall semester)

**4210. Land Reclamation Seminar. 1 (Max. 2).**

Discusses pertinent topics within the reclamation field of disturbed lands. *Prerequisite:* REWM 4200 or concurrent registration. (Normally offered fall semester)

**4285. Wildland Hydrology. 3.** Teaches essential and unique characteristics of hydrologic cycle as occurred on range and forest lands, concentrating on quantification of these processes and storages. Cross listed with ENR 4285. Dual listed with REWM 5285. *Prerequisite:* QA (Normally offered fall semester of even-numbered years)

**4300 [3320]. Grass Taxonomy. 3.**

Identification of grasses and their place in range management and world agriculture. Dual listed with REWM 5300. *Prerequisite:* REWM 2500 or LIFE 2023. (Normally offered spring semester)

**4330. Rangeland Ecosystem Assessment and Monitoring. 3.**

Assessment, monitoring, and analysis of rangeland ecosystems and processes. Students integrate sampling

design, measurements of vegetation attributes, indicators of rangeland health, ecological site information, riparian and wildlife habitat values, utilization, and statistical applications to evaluate rangeland resource integrity and sustainable use. Students collect, analyze, and report data using current technologies. *Prerequisites:* REWM 2000, REWM 2500, and STAT 2050 or 2070. Concurrent enrollment in REWM 2500 and STAT 2050/STAT 2070 is permissible. (Normally offered fall semester)

**4340. Reclamation Techniques Field Trip.**

**2.** Provides increased comprehension of current land reclamation problems and solutions by means of a field trip to sites in region where land reclamation is occurring. *Prerequisite:* REWM 4200. (Normally offered fall semester)

**4530. Seminar. 1 (Max. 2). [(none)◀COM2]**

Discusses pertinent range management problems. *Prerequisite:* REWM 2000 (earn at least a C) or ENR 4000.

**4540. Problems. 1-4 (Max. 6).** Experimental work or intensive reading and discussion on range management problems. Includes problems offered in the following areas of range management: natural resources ecology, livestock habitat, business, improvements, watershed, reclamation, extension, and international development. *Prerequisite:* basic training in field of problem selected and consent of instructor. (Offered fall, spring and summer)

**4550. Internship in \_\_\_\_\_. 1 (Max. 4).**

Supervised field experience in range management or disturbed land reclamation. No more than 4 credits. *Prerequisites:* basic course work in subject selected and consent of instructor.

**4580. Rangeland Restoration Ecology. 3.**

Detailed analysis of various disturbed ecosystems unique to western rangelands. Primary emphasis on plant community restoration following degradation from edaphic, biotic, hydrologic, and topographic influences on degradation and strategies for vegetative rehabilitation. Strong focus on current research to formulate restoration strategies. Dual listed with REWM 5580. *Prerequisites:* REWM 4200 or LIFE 3400.

**4700. Wildland Watershed Management.**

**3.** Studies hydrological cycle with specific emphasis on the role of vegetation in hydrologic processes such as interception, surface detention storage, infiltration, percolation, run-off, and water quality. Utilization of watersheds and vegetation manipulation practices to modify these hydrologic processes. *Prerequisite:* LIFE 1001 or 1010. (Normally offered spring semester)

**4710 [4180]. Watershed Water Quality Management. 3.**

Studies watershed processes controlling water quality. Examines impacts of

land use activities such as agriculture production, livestock grazing, and mineral and natural gas extraction on surface water and ground water quality. Emphasis will be placed on water quality modeling and management. Dual listed with REWM 5710. *Prerequisites:* CHEM 1000. (Normally offered spring semester)

**4750. Wildlife Habitat Restoration Ecology. 3.**

Emphasis on fundamental and applied aspects of restoration ecology for terrestrial wildlife habitats following anthropogenic and natural disturbances. Although the course overviews theoretical concepts applicable to many systems, there is a focus on applications for wildlife habitats in western North America. Dual listed with REWM 5750. *Prerequisites:* Minimum of 6 hours of Biology or Life Sciences courses.

**4830. Ecological Applications for Wildland Management. 3. [WB◀COM2]**

Emphasis on applying understanding of interactions among components of rangelands to facilitate sustainable provision of ecosystem services. The influences of stochasticity and disturbances on ecosystem structure and function will be the focus of discussion and technical writing exercises. *Prerequisites:* WA, REWM 2000 (earn at least a C), LIFE 3400 (latter may be concurrent). (Normally offered fall semester)

**4850. Rangeland Vegetation Management Techniques. 3.**

Uses applied ecological principles in restoration of degraded rangeland ecosystems to introduce methods for manipulating rangeland vegetation that satisfy land management objectives. Provides ecologically-sound practices to maintain optimal and sustained yield of rangeland products. *Prerequisites:* C or better in REWM 2000 and SB. (Normally offered spring semester)

**4900. Rangeland Management Planning.**

**3. [WC◀COM3]** Applies planning processes that integrate soil, vegetation, water, livestock, wildlife, and environmental regulatory considerations within the context of satisfying ecologically sustainable rangeland management objectives. *Prerequisites:* REWM 4830, ECON or AGECE 1010 or 1020, SOIL 4120 or 4150 (may be concurrent), REWM 3020 (may be concurrent), REWM 4330 (may be concurrent). (Normally offered spring semester)

**4990. Undergraduate Teaching Practicum. 1 (Max 2).**

Teaching experience in classroom or laboratory assisting faculty instructor. (Offered based on sufficient demand and resources)

**5000. Range Resource Management. 3.**

Basic concepts and theories of rangeland resource management, trends in rangeland classification, grazing management and improvement

practices. *Prerequisite:* graduate classification in agriculture or related natural resource subject matter areas.

**5050. Range Forage Quality. 3.** Effects of environments, grazing, and management factors on preference and forage values of native range plants for domestic and wild grazing animals. *Prerequisite:* graduate or senior standing and REWM 2000 and ANSC 2020 or 3100.

**5103. Range and Ranch Recreation. 3.** Understanding of public demands for leisure use of and private rangelands; potential impacts on rangeland resources, ranch practices and families and other rangeland users. Preparation of public range or private ranch recreation operations plan. Graduate students assist in preparation and presentation of lecture. Dual listed with REWM 4103. *Prerequisites:* REWM 2000 and CS course.

**5150. Behavior Modification for Production of Grazing Herbivores. 3.** Strategies for manipulation of behavior and management of the grazing herbivore are developed from scientific and practical information. Designed to equip the student to manage for animal and natural resource production. Dual listed with REWM 4150. *Prerequisite:* REWM 2000 and ANSC/REWM 3020 or ANSC 3100.

**5250. Water Resources Seminar. 1.** Objective is to develop interaction among students from the various water resource disciplines to enhance their perspectives on how water problems are addressed within an interdisciplinary environment. *Prerequisite:* graduate status.

**5285. Wildland Hydrology. 3.** Teaches essential and unique characteristics of hydrologic cycle as occurs on range and forest lands, concentrating on quantification of these processes and storages. Cross listed with ENR 5285. Dual listed with REWM 4285. *Prerequisite:* graduate standing and University Studies QA.

**5300. Grass Taxonomy. 3.** Identification of grasses and their place in range management and world agriculture. Dual listed with REWM 4300. *Prerequisite:* REWM 2500 or LIFE 2023.

**5520. Ecology and Management of Grasslands. 3.** Ecological nature, management strategies, and management problems of North American and world grassland ecosystems. *Prerequisites:* REWM 4300, 5300 and BOT 4700.

**5580. Rangeland Restoration Ecology. 3.** Detailed analysis of various ecosystems unique to western rangelands. Primary emphasis on plant community restoration following degradation from edaphic, biotic, hydrologic, and topographic factors. Application of ecological principles to rehabilitate vegetation and restore ecosystem function. Strong emphasis on current research to formulate restoration strategies. *Prerequisites:* REWM 4200 or LIFE 3400.

**5610. Quantitative Modeling in Landscape Ecology. 3.** Emphasis on quantitative, spatial analysis of landscapes and application of these quantitative tools to making sound management decisions. Work with real data, acquire high-level quantitative skills, develop problem-solving skills, and discuss management application of model results. Analysis will encompass abiotic, biotic (plant and animal), and human use of ecological systems in a spatial context. Cross listed with ECOL 5610. *Prerequisites:* upper division stats course (e.g., STAT 4015 or STAT 4025) and graduate standing.

**5620. Graduate Seminar. 1-2 (Max. 6).** Presentation and discussion of recent range management research. *Prerequisite:* graduate standing.

**5640. Investigation. 1-4 (Max. 10).** Research on specialized problems in range management. Investigations offered in the following areas of range management, habitat management, business management, range improvements and monitoring, watershed management, extension and international development. *Prerequisite:* graduate standing.

**5710. Watershed Water Quality Management. 3.** Studies watershed processes controlling water quality. Examines impacts of land use activities such as agriculture production, livestock grazing and mineral and natural gas extraction on surface water and ground water quality. Emphasis is placed on water quality modeling and management. Dual listed with REWM 4710. *Prerequisites:* CHEM 1000.

**5750. Wildlife Habitat Restoration Ecology. 3.** Emphasis on fundamental and applied aspects of restoration for terrestrial wildlife habitats following anthropogenic and natural disturbances. Although the course overviews theoretical concepts applicable to many systems, there is a focus on applications for wildlife habitats in western North America. Dual listed with REWM 4750. *Prerequisites:* Minimum of 6 hours of Biology or Life Sciences courses.

**5800. Experiments in Restoration. 2.** Emphasis on the current status of restoration science and the application of ecological theory in restoration ecology. Focus on concepts of population genetics, metapopulation biology and ecosystem science, food webs, biodiversity and invasion, conceptual models, experimental design, and climate change. Address topics in experimental, ecological restoration. *Prerequisites:* graduate standing, STAT 2050, LIFE 3400.

**5830. Wildlife Habitat Ecology. 2.** For students in wildlife and rangeland ecology emphasizing the relationships between wild-

life populations and their habitats. Concepts forming the basis of wildlife habitat ecology including habitat and niche, habitat metrics, resource selection, habitat-relationships modeling, and habitat restoration and management.

*Prerequisites:* Graduate-level course in statistics and graduate standing or instructor consent.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

## Earth System Science with a Concentration in Soil Science

The new Earth's Systems Science (ESS) undergraduate program integrates several disciplines across the UW campus, providing greater opportunities for students to learn about the importance of different components of the Earth. Soil Science is an integrating subject that unifies interactions among the atmosphere, hydrosphere, lithosphere, and biosphere. An ESS degree with a concentration in Soil Science enhances educational opportunities for students by offering unique learning experiences because of UW's location, resources, and faculty.

FRESHMAN YEAR: Fall		Hrs.
ESS	1000 .....	2
CHEM	1020 or 1050 .....	4
MATH	1450 .....	5
LIFE	1010 .....	4
<b>Total</b>		<b>15</b>

<b>FRESHMAN YEAR: Spring</b>	<b>Hrs.</b>
SOIL 2010 .....	4
CHEM 1030 or 1060 .....	4
LIFE 2XXX .....	4
ENGL 1010 .....	3
PEAC 1001 .....	1
<b>Total</b>	<b>16</b>

<b>SOPHOMORE YEAR: Fall</b>	<b>Hrs.</b>
ESS 2000 .....	4
SOIL 3130 .....	3
MATH 2200 .....	4
USP Cultural Context and Diversity .....	3
<b>Total</b>	<b>14</b>

<b>SOPHOMORE YEAR: Spring</b>	<b>Hrs.</b>
MATH 2205 .....	4
GEOL/GEOG Elective .....	5
BOT Elective .....	3
REWM Elective .....	3
<b>Total</b>	<b>15</b>

<b>JUNIOR YEAR: Fall</b>	<b>Hrs.</b>
SOIL 4120 .....	4
ESS 3480 .....	3
PHYS 1310 .....	4
USP Oral Communication .....	3
<b>Total</b>	<b>14</b>

<b>JUNIOR YEAR: Spring</b>	<b>Hrs.</b>
ESS 4001 .....	4
SOIL 4100 .....	3
SOIL 4140 .....	4
BOT/GEOL/GEOG 4111 .....	3
<b>Total</b>	<b>14</b>

<b>JUNIOR YEAR: Summer (optional)</b>	<b>Hrs.</b>
ESS 4970 .....	3

<b>SENIOR YEAR: Fall</b>	<b>Hrs.</b>
SOIL 4535 .....	3
SOIL 4430 .....	3
GEOG 4200 .....	4
USP Cultural Context .....	6
<b>Total</b>	<b>16</b>

<b>SENIOR YEAR: Spring</b>	<b>Hrs.</b>
ESS 4950 .....	3
SOIL 4130 .....	3
SOIL 4150 or 4160 .....	3
SOIL 4720 .....	1
USP V Course .....	3
<b>Total</b>	<b>13</b>

**Total Credit Hours** 120

### Minor in Soil Science

This program is designed to enhance soil expertise for students majoring in agricultural, natural resources, and environmental sciences degree programs. Undergraduate students minoring in Soil Science will enhance their job prospects with federal land management or conservation agencies (e.g., Forest Service, Bureau of Land Management, Natural Resources

Conservation Society), state and federal regulatory agencies (e.g., Wyoming Department of Environmental Quality), mining and oil companies, environmental consulting companies, or scientific research organizations.

Course requirements (15 credit hours) for a Soil Science minor are: SOIL 2010, plus 11 credits of upper-division soil science courses for a total of 15 credits.

### Soil Science Graduate Study

The department offers graduate work leading to the Master of Science and Doctor of Philosophy degrees in soil science, an affiliated graduate certificate in reclamation and restoration ecology, and an affiliated graduate option in water resources. Our faculty have active programs in soil-plant fertility and nutrition, soil morphology, genesis and classification, soil and water quality, environmental soil microbiology, soil and environmental chemistry, and soil and water physics.

## Soil Science (SOIL)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀Q]).

**2010. Introduction to Soil Science. 4. [SE◀(none)]** Introduces soil ecological processes and management in terrestrial environments. Discusses interaction of soil, biological, chemical, morphological, and physical properties with land management in wild land and agricultural ecosystems. Emphasis is on plant response to soil conditions. *Prerequisites:* CHEM 1000 or CHEM 1020.

**3000. Irrigated Agriculture. 3.** Study of the complexity of plant/soil water relationships and its importance on irrigation. Soil and water relations, reference/crops evapotranspiration, and management of the water balance. Principles of chemigation, computer modeling/monitoring included. Methods for irrigation scheduling and the importance of water use efficiency as a strategy for water conservation. Cross listed with PLNT 3000. *Prerequisites:* MATH 1400, SOIL 2010.

**3130. Environmental Quality. 3.** Introduction to environmental quality issues and events. Course emphasizes impacts to soil, water, atmospheric, and vegetative ecosystems due to different nutrients and contaminants, including nitrogen, phosphorus, sulfur, trace elements, and organic chemicals. Current information pertaining to environmental quality is discussed and a field trip to the Union

Pacific Tie Plant. Cross listed with ENR 3130. *Prerequisite:* complete at least 1 University Studies Science course SB, SP or SE. (Offered fall semester)

**4100. Soil Physics. 3.** Examines forms and interrelations of matter and energy in the soil environment. Primarily addresses fluxes and transformations of soil water and solutes, as well as physical properties that influence soil productivity. Dual listed with SOIL 5100. *Prerequisite:* SOIL 2010 or equivalent introductory soils course. (Offered spring semester)

**4105. Soil Physics Laboratory. 2.** Teaches students the methodology and use of equipment to measure soil physical properties in the laboratory and field. Experiments include particle size analysis, soil surface area, soil-water measurement with neutron probe and TDR, field infiltration rate, soil-water retention curve, soil pore size distribution saturated and unsaturated conductivities, soil water potential and solute breakthrough curve. Dual listed with SOIL 5105. *Prerequisite:* SOIL 2010.

**4120. Genesis, Morphology and Classification of Soils. 4.** Processes of soil development and methods of description, survey and classification. Includes field trips which examine soils in the Laramie Basin and surrounding mountains. Dual listed with SOIL 5120. *Prerequisite:* SOIL 2010. (Offered fall semester)

**4130. Chemistry of the Soil Environment. 3.** Introduction to the chemical properties and reactions that occur in the soil environment. Fundamental principles of soil mineralogy, organic matter and equilibrium chemistry as they relate to soil chemical reactions, plant nutrient availability and pedogenetic processes will be emphasized. Dual listed with SOIL 5130. *Prerequisite:* SOIL 2010, CHEM 1030 or CHEM 1060. (Offered spring semester)

**4135. Soil Chemistry Laboratory. 2.** Laboratory techniques and methods of analysis will be used to examine soils, sediments, and water chemical characteristics and reactions. Experiments will include data analysis, computer models, nutrient and contaminant characteristics, mineral properties, soil/sediment oxidation-reduction reactions as well as others. Students will be required to develop a soil chemistry experiment in their area of interest. Dual listed with SOIL 5135. *Prerequisite:* completion or concurrent enrollment in SOIL 4130/5130 or GEOL 4777.

**4140. Soil Microbiology. 4.** Fundamental principles of soil microbiology and how they relate to microbial ecology, environmental contamination, agriculture and forestry. Dual listed with SOIL 5140; cross listed with MICR 4140. *Prerequisite:* SOIL 2010.



**4150. Forest and Range Soils. 3.** Characteristics and management of forest and range soils primarily in arid environments. Examines pedagogical units representative of forests and ranges and soil properties, such as nutrient availability and water relations that influence plant growth. Dual listed with SOIL 5150. *Prerequisite:* SOIL 2010. (Normally offered fall semester)

**4160. Soil Fertility and Fertilizers. 3.** Physical, chemical, and biological aspects of soils that impact fertilizer fate, uptake, and plant growth. Dual listed with SOIL 5160. *Prerequisite:* SOIL 2010. (Normally offered fall semester of odd-numbered years)

**4535. Soil Biogeochemistry. 3.** Focuses on fundamental considerations of organic substances, microbiological systems, and chemical processes in soils, sediments, and waters. Examination of the nature and origin of organic matter and the role of microorganisms in organic nutrient transformations, reactions, and interactions in different ecosystems. Dual listed with SOIL 5535. *Prerequisites:* SOIL 2010, completion of courses in introductory college chemistry and biology, and consent of instructor(s).

**4565. Research: Soil Science. 1-4 (Max. 6).** Library, laboratory, and/or green-house investigations on select research topics. Graduate students will be required to give a presentation to the soil science group on their final product/report. Dual listed with SOIL 5565. *Prerequisite:* basic training in soil science research.

**5100. Soil Physics. 3.** Examines the forms and interrelations of matter and energy in the soil environment. Fluxes and transformations of soil water and solutes are addressed primarily, as well as physical properties which influence soil productivity. Dual listed with SOIL 4100. *Prerequisite:* MATH 2310.

**5105. Soil Physics Laboratory. 2.** Students learn methodology and use of equipment to measure soil physical properties in the laboratory and field. Experiments include particle size analysis, soil surface area, soil-water measurement with neutron probe and TDR, field infiltration rate, soil-water retention curve, soil pore size distribution, saturated and unsaturated conductivity, soil water potential, and solute breakthrough curve. Dual listed with SOIL 4105. *Prerequisite:* SOIL 2010.

**5110. Modeling Water and Chemical Transport in Vasoe Zone and Groundwater Systems. 4.** Mathematical models will be formulated and applied to simulate water flow and chemical transport in soil and groundwater systems. Soil spatial variability and heterogeneity will be considered in the modeling

processes. Using and comparing models, students will obtain the capability to transfer a physical problem to a mathematical model, to use numerical methods, such as the finite element method, to solve the mathematical problem, and to correctly interpret the numerical outputs. Students will develop and program numerical solutions for select problems and will utilize existing codes for modeling a variety of comprehensive problems. Cross listed with MATH 5110.

**5120. Genesis, Morphology, and Classification of Soils. 4.** Processes of soil development and methods of description, survey and classification. Includes field trips which examine soils in the Laramie Basin and surrounding mountains. Dual listed with SOIL 4120. *Prerequisite:* SOIL 2010.

**5130. Chemistry of the Soil Environment. 3.** Evaluation of the chemical and physical properties and reactions that occur in the soil environment. Fundamental principles of soil mineralogy, organic matter, and equilibrium chemistry as they relate to soil chemical reactions, plant nutrient availability, and pedogenetic processes will be emphasized. Dual listed with SOIL 4130. *Prerequisite:* MATH 1400, CHEM 1030 or CHEM 1060 and SOIL 2010.

**5135. Soil Chemistry Laboratory. 2.** Laboratory techniques and methods of analysis are used to examine soils, sediments, and water chemical characteristics and reactions. Experiments include data analysis, computer models, nutrient and contaminant characteristics, mineral properties, soil/sediment oxidation-reduction reactions as well as others. Students are required to develop a soil chemistry experiment in their area of interest. Dual listed with SOIL 4135. *Prerequisite:* completion or concurrent enrollment in SOIL 4130/5130 or GEOL 4777/5777.

**5140. Soil Microbiology. 4.** Fundamental principles of soil microbiology and how they relate to microbial ecology, environmental contamination, agriculture, and forestry. Dual listed with SOIL 4140; cross listed with MICR 5140. *Prerequisite:* SOIL 2010

**5150. Forest and Range Soils. 3.** Characteristics and management of forest and range soils primarily in arid environments. Examines pedagogical units representative of forest and ranges and soil properties, such as nutrient availability and water relations, which influence plant growth. Dual listed with SOIL 4150. *Prerequisite:* SOIL 2010 and LIFE 2020.

**5160. Soil Fertility and Fertilizers. 3.** Physical, chemical and biological aspects of soils which impact fertilizer fate, uptake and plant growth. Dual listed with SOIL 4160. *Prerequisite:* SOIL 2010.

**5430. Applied Geostatistics. 3.** Designed to provide general geostatistical analyses and their applications for spatial random variables and functions. Topics covered include variogram, cross validation, kriging, cokriging, sampling strategies, and both non-conditional and conditional simulations. Several geostatistics packages are used to analyze real field data and students are encouraged to use their own data for practicing geostatistical applications. Examples are taken from geohydrology, soil science, crop science, mining, and various environmental studies. Cross listed with GEOL/STAT 5430. *Prerequisite:* STAT 4020.

**5510. Advanced Soil Genesis and Classification. 3.** In-depth evaluation of the science of pedology, the philosophy and implementation of soil classification in the U.S. and world, and the formation of soils in different environments. *Prerequisite:* SOIL 5120 and graduate standing.

**5535. Soil Biogeochemistry. 3.** Focuses on fundamental considerations of organic substances, microbiological systems, and chemical processes in soils, sediments, and waters. Examination of the nature and origin of organic matter and the role microorganisms in organic nutrient transformations, reactions, and interactions in different ecosystems. Dual listed with SOIL 4535. *Prerequisite:* SOIL 2010 and consent of instructor.

**5565. Research in Soil Science. 1-4 (Max. 6).** Library, laboratory, and/or greenhouse investigations on select research topics. Graduate students will be required to give a presentation to the soil science group on their final product/report. Dual listed with SOIL 4465. *Prerequisite:* Basic training in soil science research. SOIL 5565 reserved for graduate students.

**5590. Special Topics in Soil Science. 1-3 (Max. 6).** Special topics in soil science. Offered as an individual or small group basis as appropriate. Intended to accommodate various specialized subjects not offered on a regular basis. Students may enroll in more than one section of this course. Dual listed with SOIL 4590. *Prerequisite:* consent of instructor.

**5720. Graduate Seminar. 1 (Max. 6).** Review and discussion of recent soil research. *Prerequisite:* basic training in the field of problem selected and consent of instructor.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Graduate level course designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

## Department of Family and Consumer Sciences

251 Agriculture Building, 766-4145

FAX: (307) 766-5686

Web site: [www.uwyo.edu/fcs](http://www.uwyo.edu/fcs)

Department Head: Bruce A. Cameron

### Professors:

**DONNA M. BROWN**, B.Sc. University of New South Wales, Australia 1983; Ph.D. 1987; Professor of Design, Merchandising, and Textiles 2004, 1993, 1987.

**MICHAEL LIEBMAN**, B.S. University of New Hampshire 1974; M.S. Virginia Polytechnic Institute and State University 1977; Ph.D. 1980; Professor of Human Nutrition and Food 1994, 1985.

**VIRGINIA B. VINCENTI**, B.S. Mansfield University of Pennsylvania 1968; M.S. The Pennsylvania State University 1975; Ph.D. 1981; Professor of Human Development and Family Sciences 1992.

### Associate Professors:

**BRUCE A. CAMERON**, B.Sc. University of New South Wales, Australia 1983; Ph.D. 1986; Associate Professor of Design, Merchandising, and Textiles 1997, 1986.

**D. ENETTE LARSON-MEYER**, B.S. University of Wyoming 1987; M.S. MGH Institute of Health Professions, Boston 1990; Ph.D. University of Alabama at Birmingham 1998; Associate Professor of Human Nutrition and Food/Dietetics 2011, 2005.

**RHODA SCHANTZ**, B.S. North Dakota State University 1976; M.S. 1978; Ph.D. Kansas State University 1988; Associate Professor of Human Nutrition and Food/Dietetics 1995, 1990.

### Assistant Professor:

**JENNIFER HARMON**, B.S. Illinois State University 2009; M.S. The Ohio State University 2013; Ph.D. 2014; Assistant Professor of Design, Merchandising, and Textiles 2015.

**ERIN IRICK**, B.S. Kansas State University 2000; M.S. 2006; Ph.D. Oklahoma State University 2013; Assistant Professor of Design, Merchandising, and Textiles 2013.

**CHRISTINE WADE**, B.S. Willamette University 2001; M.S. University of Wyoming 2005; Ph.D. 2008; Assistant Professor of Human Development and Family Sciences 2008.

### Academic Professionals:

**DIANNE BARDEN**, B.S. University of Wisconsin - Stout 1980; M.A. Grand Canyon University 2004; Assistant Lecturer - Coordinator Distance Degree Programs 2006.

**MARK BITTNER**, B.S. 1989; M.S. University of Wyoming 1993; Senior Lecturer, Human Development and Family Sciences 2012, 2008, 1991.

**KRISTIN McTIGUE**, B.A. Northwestern University; M.S. New York University 2009; Assistant Lecturer, Director, Didactic Program in Nutrition and Dietetics 2014.

**TREVA SPROUT AHRENHOLTZ**, B.S. 1993, 1997 University of Wyoming; M.S. 1995; Associate Lecturer, Design, Merchandising, and Textiles 2005, 2013.

### Professor Emeritus:

Saul Feinman, Judith A. Powell, Randolph R. Weigel, Karen Williams

Our mission is to enhance the physical, social, and economic well-being of individuals, families, and communities, emphasizing healthy and sustainable living across the lifespan. We fulfill our mission through instructional, research, and outreach/extension efforts that challenge, motivate, and inspire.

Family and Consumer Sciences integrates the fundamental components of human life—food, shelter, clothing, human relationships, and family—with larger societal systems. Through programs in textiles, apparel and design; food and nutrition; and human development and family sciences, our department prepares learners to meet the opportunities and challenges of today's complex world.

All students pursuing the Bachelor of Science in Family and Consumer Sciences degree are required to complete a minimum

of 120 credit hours that include a) University Studies requirements (USP); b) departmental core curriculum; and c) courses in one of the following individual options: dietetics, human nutrition and food, human development and family sciences, professional child development (online only), or design, merchandising and textiles. Minors in apparel design, human development and family sciences, human nutrition, and interior design are also available.

### Grade Requirements

Students are required to pass all courses within the Department of Family and Consumer Sciences with a grade of C or better. The university allows students only three enrollment attempts per course. Withdrawals and failed attempts count. If you do not pass the course with a grade of C or better after three attempts you could be dismissed from your family and consumer sciences major.

### Security Screening

All students applying for admission to the Professional Child Development option are required to complete a security screening before they will be allowed entry into the program. Students in the Human Development and Family Sciences option must complete their security screening upon declaration of their major. In both cases, the student is responsible for the cost of this screening. Failure to satisfactorily complete this requirement will result in the student being dropped from or denied entry to the program.

### Family and Consumer Sciences Core Requirements

A core curriculum is required of all family and consumer sciences majors. This requirement is based on a common body of knowledge in family and consumer sciences which contains concepts relevant to all program areas (options).

The family and consumer sciences core consists of the following courses:

FCSC 2200 Professionalism & Communication in Family and Consumer Sciences .....	3
Plus two courses from the list below (depending on your FCSC program area/option)	
<i>One of the following in consultation with your advisor:</i>	
FCSC 1141 Principles of Nutrition.....	3
FCSC 1150 Scientific Study of Food.....	3

One of the following in consultation with your advisor:

FCSC 1180 Applied Design .....	3
FCSC 2170 Clothing in Modern Society .....	3
FCSC 2180 Housing.....	3
FCSC 3171 Introduction to Textile Science	3
FCSC 4181 Global Textiles .....	3

One of the following in consultation with your advisor:

FCSC 2110 Fundamentals of Aging & Human Development .....	3
FCSC 2121 Child Development.....	4
FCSC 2131 Family Relations .....	3
FCSC 2133 Intimate Relationships .....	3
FCSC 3110 Personal Finance.....	3
FCSC 3220 Multicultural Influences on Children and Families .....	3

**Family and Consumer Sciences Student Learning Outcomes**

Students graduating from the Department of Family and Consumer Sciences will be proficient in their program area content as well as be able to effectively communicate (both written and orally), possess intellectual skills (such as critical, creative and problem solving), and demonstrate appropriate levels of professionalism. For a more detailed description, please see the FCS Undergraduate Student Handbook.

**Family and Consumer Sciences Options**

Students must obtain and follow a check sheet for their chosen program area. Standards established by several professional organizations require completion of specific courses in addition to the family and consumer sciences core and USP requirements. All students are assigned a faculty advisor. Students must work closely with their advisor to be sure all requirements are met.

**Dietetics**

Students who complete the dietetics option meet academic requirements as approved by the Accreditation Council for Education in Nutrition and Dietetics (ACEND) of the Academy of Nutrition. Completion of this curriculum allows students to pursue a post-graduate competitive internship to become eligible to take the examination for Registered Dietitians. The Didactic Program in Nutrition and Dietetics (DPND) is currently accredited.

The following course sequence is recommended for FCSC majors who wish to apply to and be accepted into the DPND. Entrance into the DPND is made only through an application process. Each prospective DPND student will initially enter the Human Nutrition and

Food option. It is recommended that students apply to the DPND in the spring semester of their sophomore year. A cumulative grade point average of 3.0 is required for program admission. Students must also have a grade point average of at least 3.0 in the following courses from the list below: CHEM 1020, CHEM 1030, ENGL 1010, FCSC 1141, FCSC 1150, FCSC 2200, LIFE 1010, MATH 1400, MOLB 2021, PSYC 1000, and SOC 1000.

**FRESHMAN YEAR: Fall Hrs.**

ENGL 1010 College Composition .....	3
FCSC 1141 Principles of Nutrition.....	3
LIFE 1010 General Biology .....	4
MATH 1400 College Algebra .....	3
USP First Year Seminar.....	3
<b>Total</b>	<b>16</b>

**FRESHMAN YEAR: Spring Hrs.**

CHEM 1020 General Chemistry I.....	4
FCSC 1150 Scientific Study of Food.....	3
POLS 1000 American & WY Government	3
PSYC 1000 General Psychology .....	3
SOC 1000 Sociological Principles .....	3
<b>Total</b>	<b>16</b>

**SOPHOMORE YEAR: Fall Hrs.**

CHEM 1030 Gen. Chemistry II .....	4
FCSC Nutrition Elective.....	3
FCSC 2200 Professionalism and Communication in FCSC.....	3
MOLB 2021 General Microbiology .....	4
<b>Total</b>	<b>14</b>

**SOPHOMORE YEAR: Spring Hrs.**

CHEM 2300 Intro Organic Chemistry.....	4
FCSC Core Elective I .....	3-4
STAT 2050 Fundamentals of Statistics .....	4
ZOO 3115 Human Systems Physiology .....	4
<b>Total</b>	<b>15-16</b>

After admission into the DPND, students must complete the following course sequence and maintain an overall grade point average of 3.0. Electives should be selected in consultation with a student’s advisor to ensure fulfillment of upper division and USP requirements, and to enhance the student’s educational experience.

**JUNIOR YEAR: Fall Hrs.**

FCSC 3145 Sports Nutrition and Metabolism .....	3
FCSC 4142 Nutrition and the Elderly.....	1
FCSC 3147 Community Nutrition .....	3
MOLB 3610 Principles of Biochemistry .....	4
ZOO 2040 Human Anatomy .....	3
ZOO 2041 Human Anatomy Lab .....	1
<b>Total</b>	<b>15</b>

**JUNIOR YEAR: Spring Hrs.**

ENGL 4010 Technical Writing in the Professions .....	3
FCSC 3140 Maternal, Infant, and Adolescent Nutrition .....	3
FCSC 3150 Intermediate Foods .....	2
FCSC 4147 Nutrition and Weight Control ...	3
MOLB 4100 Clinical Biochemistry.....	3
<b>Total</b>	<b>14</b>

**SENIOR YEAR: Fall Hrs.**

FCSC 3152 Food Systems Production .....	3
FCSC 4145 Advanced Nutrition .....	4
FCSC 4210 Therapeutic Nutrition I.....	4
MGT 3210 Management and Organization	3
<b>Total</b>	<b>14</b>

**SENIOR YEAR: Spring Hrs.**

FCSC 4220 Therapeutic Nutrition II .....	4
FCSC 4230 Therapeutic Nutrition Counseling .....	2
FCSC 4150 Experimental Foods .....	3
FCSC Core Elective II.....	3
Elective .....	3
<b>Total</b>	<b>15</b>

**TOTAL MINIMUM CREDIT HOURS 120**

**Human Nutrition and Food**

Students who graduate from the human nutrition and food option will be prepared to pursue careers in human nutrition, the food industry, or to pursue graduate degrees.

The following course sequence is recommended for FCSC majors in this program area. Electives should be selected in consultation with a student’s advisor to ensure fulfillment of upper division and USP requirements, and to enhance the student’s educational experience.

**FRESHMAN YEAR: Fall Hrs.**

ENGL 1010 College Composition .....	3
FCSC 1141 Principles of Nutrition.....	3
LIFE 1010 General Biology .....	4
MATH 1400 College Algebra .....	3
USP First Year Seminar.....	3
<b>Total</b>	<b>16</b>

**FRESHMAN YEAR: Spring Hrs.**

CHEM 1020 General Chemistry I.....	4
FCSC 1150 Scientific Study of Food.....	3
POLS 1000 American & WY Government .	3
PSYC 1000 General Psychology .....	3
SOC 1000 Sociological Principles .....	3
<b>Total</b>	<b>16</b>

**SOPHOMORE YEAR: Fall Hrs.**

CHEM 1030 Gen. Chemistry II .....	4
FCSC HNF Elective I .....	3
FCSC 2200 Professionalism and Communication in FCSC.....	3
MOLB 2021 General Microbiology .....	4
<b>Total</b>	<b>14</b>

<b>SOPHOMORE YEAR: Spring</b>	<b>Hrs.</b>
CHEM 2300 Intro Organic Chemistry.....	4
FCSC Core Elective I .....	3-4
STAT 2050 Fundamentals of Statistics .....	4
ZOO 3115 Human Systems Physiology .....	4
<b>Total</b>	<b>15-16</b>

<b>JUNIOR YEAR: Fall</b>	<b>Hrs.</b>
FCSC 4142 Nutrition and the Elderly.....	1
ZOO 2040 Human Anatomy .....	3
ZOO 2041 Human Anatomy Lab .....	1
FCSC HNF Elective II.....	3
Elective .....	3
Restricted Elective.....	3
<b>Total</b>	<b>14</b>

<b>JUNIOR YEAR: Spring</b>	<b>Hrs.</b>
ENGL 4010 Technical Writing in the Professions .....	3
FCSC 3140 Maternal, Infant, and Adolescent Nutrition .....	3
FCSC 4147 Nutrition and Weight Control ...	3
Restricted Elective.....	3
Restricted Elective.....	3
Total	15

<b>SENIOR YEAR: Fall</b>	<b>Hrs.</b>
FCSC 4145 Advanced Nutrition .....	4
Elective .....	1
Elective .....	3
Restricted Elective.....	3
Restricted Elective.....	3
<b>Total</b>	<b>14</b>

<b>SENIOR YEAR: Spring</b>	<b>Hrs.</b>
FCSC 4150 Experimental Foods .....	3
FCSC Core Elective II.....	3
Elective .....	3
Restricted Elective.....	3
Restricted Elective.....	3
<b>Total</b>	<b>15</b>
<b>TOTAL MINIMUM CREDIT HOURS</b>	<b>120</b>

This program requires 20 credit hours of restricted electives that must be approved by the advisor. The student may select 12 credit hours of additional electives.

**Premedicine Career Track in Human Nutrition and Food**

Students who wish to pursue the pre-medicine career track will obtain the necessary coursework to apply to medical or other appropriate professional schools. This track requires that specific substitutions and additions must be made to the general human nutrition and food curriculum (see below).

The following course sequence is recommended for FCSC majors in this program area. Electives should be selected in consultation

with a student’s advisor to ensure fulfillment of upper division and USP requirements, and to enhance the student’s educational experience. Students should carefully research professional school admission requirements as they may require additional coursework.

<b>FRESHMAN YEAR: Fall</b>	<b>Hrs.</b>
CHEM 1020 General Chemistry I .....	4
FCSC 1141 Principles of Nutrition.....	3
MATH 1450 Algebra and Trigonometry .....	5
USP First Year Seminar.....	3
<b>Total</b>	<b>15</b>

<b>FRESHMAN YEAR: Spring</b>	<b>Hrs.</b>
CHEM 1030 General Chemistry II .....	4
ENGL 1010 College Composition .....	3
FCSC 1150 Scientific Study of Food.....	3
LIFE 1010 General Biology I.....	4
SOC 1000 Sociological Principles .....	3
<b>Total</b>	<b>17</b>

<b>SOPHOMORE YEAR: Fall</b>	<b>Hrs.</b>
CHEM 2420 Organic Chemistry I .....	4
FCSC Core Elective I .....	3-4
FCSC 2200 Professionalism and Communication in FCSC.....	3
MOLB 2021 General Microbiology .....	4
<b>Total</b>	<b>14-15</b>

<b>SOPHOMORE YEAR: Spring</b>	<b>Hrs.</b>
CHEM 2440 Organic Chemistry II.....	4
MATH 2200 Calculus I.....	4
STAT 2050 Fundamentals of Statistics .....	4
ZOO 3115 Human Systems Physiology .....	4
<b>Total</b>	<b>16</b>

<b>JUNIOR YEAR: Fall</b>	<b>Hrs.</b>
FCSC 4142 Nutrition and the Elderly.....	1
MOLB 3610 Principles of Biochemistry .....	4
PHYS 1110 General Physics I.....	4
ZOO 2040 Human Anatomy .....	3
ZOO 2041 Human Anatomy Lab .....	1
<b>Total</b>	<b>13</b>

<b>JUNIOR YEAR: Spring</b>	<b>Hrs.</b>
ENGL 4010 Technical Writing in the Professions .....	3
FCSC 3140 Maternal, Infant, and Adolescent Nutrition .....	3
MOLB 4100 Clinical Biochemistry.....	3
PHYS 1120 General Physics II .....	4
POLS 1000 American & WY Government .....	3
<b>Total</b>	<b>16</b>

<b>SENIOR YEAR: Fall</b>	<b>Hrs.</b>
FCSC 4145 Advanced Nutrition .....	4
FCSC Nutrition Elective.....	3
PSYC 1000 General Psychology .....	3
Elective .....	3
<b>Total</b>	<b>13</b>

<b>SENIOR YEAR: Spring</b>	<b>Hrs.</b>
FCSC 4150 Experimental Foods .....	3
FCSC Core Elective II.....	3
Elective .....	3
Elective .....	3
Elective .....	3
<b>Total</b>	<b>15</b>
<b>TOTAL MINIMUM CREDIT HOURS</b>	<b>120</b>

Fourteen credit hours are included in this program and should be selected in consultation with the student’s advisor. Students should carefully research professional school admission requirements before selecting electives.

**Professional Child Development**

The professional child development option is offered by distance delivery only but has the same quality and requirements as on-campus programs. All students are assigned an advisor who works closely with them throughout their program. Completion of this degree prepares students for teaching and administrative positions in early childhood development and care; work in resource and referral agencies; Early Head Start home visitor positions; and child advocacy. It also provides a foundation for simultaneous completion of a birth-to-five teaching endorsement, for those students who apply, or post-graduate completion of a teaching certificate in early childhood special education. The distance delivery of this program allows students who have existing A.A. or A.S. degrees in child development, early childhood education, or a closely related field to complete their bachelor’s degree. Place bound students, many of whom currently work in early childhood programs, have the opportunity to earn a degree from their own hometown. Many of the courses also satisfy requirements of the Early Childhood Program Director’s Certificate.

Entry into this program is by application only. Students must apply for admission to UW first. Official transcripts from all institutions attended must be submitted to UW Admissions. Applicants must also satisfactorily complete a mandatory security screen (background check). Once a student has applied and their transcripts have been received, their application will be reviewed. Transcripts will not be analyzed prior to application. In addition to an existing associate’s degree, applicants must have successfully completed the following courses prior to entry.

<b>Required Courses Before Program Entry:</b>	
SOC 1000 Sociological Principles .....	3
PSYC 1000 General Psychology .....	3
EDEC 1020 Introduction to Early Childhood Education .....	3

Completion of the University Studies Program (USP) Q requirement  
 Completion of the University Studies Program (USP) COM1 requirement  
 Completion of the University Studies Program (USP) PN requirements  
 Completion of the University Studies Program (USP) V requirement

**Required Courses After Program Entry:**

The following course sequence is recommended for FCSC majors in this program area. Completion of this degree requires a minimum of 120 credit hours that include 42 upper division (30 of which must be from UW). Electives should be selected in consultation with a student's advisor to ensure fulfillment of upper division and USP requirements, and to enhance the student's educational experience.

<b>JUNIOR YEAR: Fall</b>	<b>Hrs.</b>
FCSC 2121 Child Development.....	4
FCSC 2131 Family Relations.....	3
FCSC 2133 Intimate Relationships .....	3
FCSC 2200 Professionalism and Communication in FCSC.....	3
<b>Total</b>	<b>13</b>

<b>JUNIOR YEAR: Spring</b>	<b>Hrs.</b>
EDEC 3000 Observing Young Children.....	3
FCSC 3119 Parent Child Relationships .....	3
FCSC 3122 Adolescence.....	3
FCSC 3220 Multicultural Influences on Children and Families .....	3
<b>Total</b>	<b>12</b>

<b>JUNIOR YEAR: Summer</b>	<b>Hrs.</b>
FCSC 1141 Principles of Nutrition.....	3
FCSC 2110 Fundamentals of Aging and Human Development.....	3
<b>Total</b>	<b>9</b>

<b>SENIOR YEAR: Fall</b>	<b>Hrs.</b>
EDEC 3220 School Programs for Young Children .....	3
EDEC 4320 Oral and Written Language Acquisition .....	3
FCSC 4124 Families of Young Children with Special Needs .....	3
FCSC 4127 Directing Preschool and Daycare Programs .....	3
<b>Total</b>	<b>12</b>

<b>SENIOR YEAR: Spring</b>	<b>Hrs.</b>
FCSC 3110 Personal Finance <i>or</i> FCSC 4112 Family Decision Making and Resource Management .....	3
ENGL 4010 Technical Writing in the Professions <i>or</i> ENGL 4075 Writing for Non-Profits .....	3
FCSC 4138 Family Stress and Coping.....	3
PSYC 4310 Developmental Psychopathology.....	3
<b>Total</b>	<b>12</b>

<b>SENIOR YEAR: Summer</b>	<b>Hrs.</b>
FCSC 2170 Clothing in Modern Society <i>or</i> FCSC 3171 Introduction to Textile Science .....	3
FCSC 4130 Internship in Child Development <i>or</i> FCSC 4131 Administrative Internship in Child Development.....	6-8
<b>Total</b>	<b>9-11</b>
<b>TOTAL MINIMUM CREDIT HOURS</b>	<b>120</b>

**Human Development and Family Sciences**

This option provides a strong foundation in the areas of human development and family sciences while allowing personalized selection of electives and internship experiences that support specific student interests. The program prepares students to work in a variety of settings, serving individuals and families across the lifespan or to pursue graduate level education. Upon declaring this program option, students must satisfactorily complete a mandatory security screen (background check).

The following course sequence is recommended for FCSC majors in this program area. Electives should be selected in consultation with a student's advisor to ensure fulfillment of upper division and USP requirements, and to enhance the student's educational experience.

<b>FRESHMAN YEAR: Fall</b>	<b>Hrs.</b>
COJO 1030 Interpersonal Communication.....	3
PSYC 1000 General Psychology.....	3
USP COM1 Elective .....	3
USP Q Elective .....	3
USP First Year Seminar.....	3
<b>Total</b>	<b>15</b>

<b>FRESHMAN YEAR: Spring</b>	<b>Hrs.</b>
FCSC Core Elective I.....	3
SOC 1000 Sociological Principles .....	3
USP PN Elective .....	3
USP V Elective .....	3
Elective .....	3
<b>Total</b>	<b>15</b>

<b>SOPHOMORE YEAR: Fall</b>	<b>Hrs.</b>
FCSC 2110 Fundamentals of Aging and Human Development.....	3
FCSC 2121 Child Development.....	4
FCSC 2131 Family Relations.....	3
FCSC 2200 Professionalism and Communication in FCSC .....	3
Elective .....	3
<b>Total</b>	<b>16</b>

<b>SOPHOMORE YEAR: Spring</b>	<b>Hrs.</b>
FCSC 2133 Intimate Relationships .....	3
FCSC 3119 Parent Child Relationships .....	3
FCSC Core Elective II.....	3
USP PN Elective .....	3-4
Elective .....	3
<b>Total</b>	<b>15-16</b>

<b>JUNIOR YEAR: Fall</b>	<b>Hrs.</b>
FCSC 3110 Personal Finance.....	3
FCSC 3122 Adolescence.....	3
Elective .....	3
Elective .....	3
Elective .....	3
<b>Total</b>	<b>15</b>

<b>JUNIOR YEAR: Spring</b>	<b>Hrs.</b>
FCSC 3220 Multicultural Influences on Children and Families .....	3
FCSC 4112 Family Decision Making and Resource Management .....	3
FCSC 4118 Family Policy.....	3
Elective .....	3
Elective .....	3
<b>Total</b>	<b>15</b>

<b>SENIOR YEAR: Fall</b>	<b>Hrs.</b>
ENGL 4075 Writing for Non-Profits <i>or</i> ENGL 4010 Technical Writing in the Professions .....	3
FCSC 4117 Understanding Community Leadership .....	3
FCSC 4125 Professional Practices in HDFS.. ..	3
Elective .....	3
Elective .....	3
<b>Total</b>	<b>15</b>

<b>SENIOR YEAR: Spring</b>	<b>Hrs.</b>
FCSC 4138 Family Stress and Coping.....	3
FCSC 4130 Internship in Child Development <i>or</i> FCSC 4131 Administrative Internship in Child Development <i>or</i> FCSC 4132 Internship in Human Development and Family Sciences.....	6-8
Elective .....	3
<b>Total</b>	<b>12-14</b>
<b>TOTAL MINIMUM CREDIT HOURS</b>	<b>120</b>

This program includes 33 credit hours of elective courses that will allow the student to acquire a supporting minor or gain more depth in an area of emphasis. Consult advisor for appropriate electives.

**Design, Merchandising, and Textiles**

Design, Merchandising and Textiles is a diverse and competitive field in which individuals plan, provide, and promote apparel, interiors and related goods desired by the consumer. A specialization in merchandising offers knowledge of business principles within the fashion and interior industries; entry into

the world of retailing, manufacturing, and design; involvement in marketing apparel and residential and commercial furnishings; and study and observation in all facets of fashion and interior organizations. Throughout coursework, concepts of sustainable design and manufacturing, as well as the influence of design on wellbeing will be highlighted.

Students are prepared for managing or owning small retail businesses in Wyoming and rural areas of the West, to working in the highly competitive, fast paced global industry.

The following course sequence is recommended for FCSC majors in this program area. Electives should be selected in consultation with a student's advisor to ensure fulfillment of upper division and USP requirements, and enhance the student's educational experience. A requirement of the program is that students participate in a three-credit-hour internship or international field study tour, or a study abroad program.

<b>FRESHMAN YEAR: Fall</b>	<b>Hrs.</b>
ENGL 1010 College Composition .....	3
FCSC 1170 Introduction to Apparel Construction .....	3
FCSC 1180 Applied Design .....	3
MATH 1400 College Algebra .....	3
USP First Year Seminar.....	3
<b>Total</b>	<b>15</b>

<b>FRESHMAN YEAR: Spring</b>	<b>Hrs.</b>
ECON/AGEC 1010 Principles of Macroeconomics.....	3
FCSC 1150 Scientific Study of Food <i>or</i> FCSC 1141 Principles of Nutrition .....	3
FCSC 1175 Design Communication .....	3
POLS 1000 American & WY Government .	3
SOC 1000 Sociological Principles .....	3
<b>Total</b>	<b>15</b>

<b>SOPHOMORE YEAR: Fall</b>	<b>Hrs.</b>
CHEM 1000 Introductory Chemistry <i>or</i> CHEM 1020 General Chemistry I .....	4
ECON/AGEC 1020 Principles of Microeconomics .....	3
FCSC 2180 Housing.....	3
FCSC 2200 Professionalism and Communication in FCSC.....	3
PSYC 1000 General Psychology .....	3
<b>Total</b>	<b>16</b>

<b>SOPHOMORE YEAR: Spring</b>	<b>Hrs.</b>
COSC 1200 Computer Information Systems. ....	3
FCSC 2170 Clothing in Modern Society .....	3
FCSC 2188 Interior Design I.....	3
FCSC 3170 Advanced Apparel Construction. ....	3
USP Science (PN) Elective.....	3
<b>Total</b>	<b>15</b>

<b>JUNIOR YEAR: Fall</b>	<b>Hrs.</b>
FCSC 3110 Personal Finance.....	3
FCSC 3173 Visual Merchandising and Promotion .....	3
FCSC 3184 Foundations of Merchandising I. ....	3
MKT 3210 Introduction to Marketing.....	3
Elective .....	3
<b>Total</b>	<b>15</b>

<b>JUNIOR YEAR: Spring</b>	<b>Hrs.</b>
FCSC 3171 Intro Textile Science .....	3
FCSC 3172 Intro Textile Science Lab .....	1
FCSC 4181 Global Textile Marketplace .....	3
MGT 3210 Management and Organization..	3
Elective .....	3
Elective .....	3
<b>Total</b>	<b>16</b>

<b>SENIOR YEAR: Fall</b>	<b>Hrs.</b>
FCSC 4113 Consumer Issues.....	3
FCSC 4171 Advanced Textiles .....	3
FCSC 4174 Foundations of Merchandising II .....	3
Elective .....	3
Elective .....	3
<b>Total</b>	<b>15</b>

<b>SENIOR YEAR: Spring</b>	<b>Hrs.</b>
FCSC 4175 Textile Testing and Product Analysis .....	3
FCSC 4176 Historic Clothing.....	3
FCSC 4182 Textile Industry and the Environment .....	3
Elective .....	1
Elective .....	3
<b>Total</b>	<b>13</b>

**TOTAL MINIMUM CREDIT HOURS 120**

This program includes 19 credit hours of elective courses that will allow the student to acquire a supporting minor or gain more depth in an area of emphasis. Consult advisor for appropriate electives.

**Family and Consumer Sciences Minors**

**Apparel Design**

A minor in apparel design is sponsored jointly by the departments of Family and Consumer Sciences and Art. It is designed to enable students with career interests in this field to gain experience in the competency areas expected of apparel designers. This minor blends functional, artistic, and fashion considerations in the design of body coverings. Students interested in this minor should consult the sponsoring departments to receive an advisor for the minor.

**Required Courses**

FCSC 1170 Introduction to Apparel Construction .....	3
FCSC 2175 Fashion Illustration.....	3
FCSC 3170 Advanced Apparel Construction. ....	3
FCSC 3171 Introductory Textile Science .....	3
FCSC 3174 Flat Pattern Design .....	3
FCSC 3175 Apparel Design Through Draping .....	3
FCSC 4178/5178 Fiber Arts.....	3
<b>AND One of the following:</b>	
ART 1120 Foundation: Three Dimension....	3
FCSC 1180 Applied Design.....	3
<b>Minor Total</b>	<b>24</b>

**Human Development and Family Sciences**

A minor in human development and family sciences provides students with a foundation of basic principles and knowledge. The coursework can enrich and complement a student's primary area of study. Students must complete 22 credit hours outlined below:

**Required Courses**

FCSC 2121 Child Development.....	4
FCSC 2131 Family Relationships.....	3
FCSC 2133 Intimate Relationships .....	3

**Elective Courses: Choose 12 credit hours from the following (9 credit hours must be 3000-level or above):**

FCSC 2110 Fundamentals of Aging & Human Development .....	3
FCSC 3110 Personal Finance.....	3
FCSC 3119 Parent Child Relationships .....	3
FCSC 3122 Adolescence.....	3
FCSC 3220 Multicultural Influences on .Children & Families.....	3
FCSC 4104 Field Studies in Family & Consumer Sciences.....	3
FCSC 4112 Family Decision Making & Resource Management .....	3
FCSC 4113 Consumer Issues.....	3
FCSC 4117 Understanding Comm. Leadership .....	3
FCSC 4124 Families of Young Children with Special Needs .....	3
FCSC 4127 Directing Preschool and Daycare Programs .....	3
FCSC 4118 Family Policy .....	3
FCSC 4138 Family Stress and Coping.....	3
<b>Minor Total</b>	<b>22</b>

**Human Nutrition**

A minor in human nutrition strengthens degrees in majors such as kinesiology and health, food science, nursing, and animal science. Students who minor in human nutrition learn how food choices can influence

their health and well-being. The course work provides the foundation for making positive life-style changes.

### Required Course

FCSC 1141 Principles of Nutrition.....3

### Elective Courses: Select 15 additional credit hours from the following:

#### Nutrition Group

FCSC 3140 Maternal, Infant and Adolescent Nutrition .....3

FCSC 3145 Sports Nutrition and Metabolism .....3

FCSC 3147 Community Nutrition.....3

FCSC 4142 Nutrition & the Elderly.....1

FCSC 4145 Advanced Nutrition .....4

FCSC 4210 Therapeutic Nutrition I.....4

FCSC 4220 Therapeutic Nutrition II .....4

FCSC 4147 Nutrition & Weight Control.....3

#### Food Group

FCSC 1150 Scientific Study of Food.....3

FCSC 3150 Intermediate Foods.....2

FCSC 3152 Food Systems Production.....3

FCSC 4150 Experimental Foods .....3

#### Independent Study

(maximum of 3 credit hours)

FCSC 4106/5102 Special Problems .....3

**Minor Total 18**

### Interior Design

A minor in interior design is sponsored jointly by the Departments of Family and Consumer Sciences and Civil and Architectural Engineering. It is designed to enable students with career interests in this field to gain experience in the competency areas expected of interior designers. Students who hope to use this minor to prepare for professional certification examination following graduation should consult the sponsoring departments to receive an advisor for the minor.

### Required Courses

ACCT 1010 Principles of Accounting I *or*

MGT 4500 Employee to Entrepreneur....3

ARE 2100 Architectural Graphics.....3

ARE 2200 Building Materials &

Construction Methods.....3

FCSC 2188 Interior Design I.....3

FCSC 3171 Intro Textile Science .....3

FCSC 3172 Intro Textile Science Lab .....1

FCSC 4188 Interior Design II.....3

### Plus one of the following:

ARE 3600 Architectural Design I .....3

ART 1110 Foundation: Two Dimensional ....3

ART 1120 Foundation: Three Dimensional.3

FCSC 1180 Applied Design .....3

### Plus one of the following:

ARE 3030 History of Architecture I.....3

ART 2020 Art History II.....3

**Minor Total 25**

### Certification

#### Early Childhood Program Director's Certificate

The Early Childhood Program Director's Certificate is available to early childhood professionals in the state as well as to students. The certificate program is designed to:

- fit Wyoming's Professional Career Development Competency Wheel and the Professional Development Career Lattice,
- fit the National Association for the Education of Young Children's guidelines for the Preparation of Early Childhood Professionals,
- complement the definition of Quality Child Care developed by the Wyoming Governor's Council on Early Childhood Development, and
- allow a variety of paths to certification.

Not only do these courses satisfy certification requirements for director of early childhood programs for many states but they also meet many of the requirements of a bachelor's degree in Family and Consumer Sciences. In addition, they also provide professional development for home providers and daycare professionals.

Those who would benefit from these courses include: Head Start teachers and directors; home providers; Department of Family Services, Adoption, and Social Service workers; public health nurses; school nurses; directors of school-age child care programs; preschool program teachers, and public school teachers.

### Graduate Study

The department of Family and Consumer Sciences offers a program of study leading to the master of science degree in family and consumer sciences with a concentration in human development and family sciences; human nutrition and food; or textiles and merchandising. The department also participates in an interdisciplinary degree in food science and human nutrition.

### Program Specific Degree Requirements

*Master of Science in Family and Consumer Sciences*

#### Plan A (thesis)

Completion of minimum of 30 hours of course credit to include: 12 hours from FCSC, 6 hours from supporting courses, 2 hours of graduate seminar, and 10 hours of research (includes four thesis hours).

Completion of research project that adheres to a topic and format previously agreed upon by the student's graduate committee and approved by the department head.

Students may be required to take more than the minimum of 30 hours, either because they have to satisfy prerequisites for some courses, or because a student's committee determines that more than 30 hours will be needed for the student to reach his/her professional objective.

No more than nine hours of 4000-level courses will be allowed.

#### Plan B (non-thesis)

Completion of minimum of 30 hours of course credit to include: 12 hours from FCSC, 6 hours from supporting courses, 2 hours of graduate seminar, and 10 hours of research (includes four thesis hours).

Completion of research project that adheres to a topic and format previously agreed upon by the student's graduate committee and approved by the department head.

Students may be required to take more than the minimum of 30 hours, either because they have to satisfy prerequisites for some courses, or because a student's committee determines that more than 30 hours will be needed for the student to reach his/her professional objective.

No more than nine hours of 4000-level courses will be allowed.

#### *Food Science and Human Nutrition Interdisciplinary Degree*

Family and consumer sciences faculty participate in an interdisciplinary program that offers a master of science degree in food science and human nutrition. Please see Food Science and Human Nutrition in this catalog for more information.

### Family and Consumer Sciences (FCSC)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**1101. First-Year Seminar. 3. [(none)♦FYS]**  
**1141. Principles of Nutrition. 3.** This course will provide an introduction to the fundamental concepts of nutrition science and the role of nutrition in overall health. Students develop an

understanding of nutritional requirements as related to metabolism of nutrients in various physiological states. Designed for nutrition majors and interested non-majors.

**1150. Scientific Study of Food. 3.** Comprehensive introduction to the study of food. Food science theories relative to composition are applied through the laboratory experiences.

**1170. Introduction to Apparel Construction. 3.** Introduction to basic and industry production techniques applied to apparel and interior products. Development of decision-making skills in selection and use of materials. (Offered spring semester)

**1175. Design Communication. 3.** Explores philosophical and practical factors of the design communication process. Incorporates various methods of communication design ideas and concepts from hand drawing to digital techniques through the Adobe Creative Suite.

**1180. Applied Design. 3. [CA◀H]** Studies design philosophy. Emphasizes application of creativity to many areas of living. (Offered both semesters)

**2050. Safety, Nutrition and Health in Early Childhood Programs. 2.** Designed to enrich students' understanding of practices which support children's health development. Issues to be explored include record keeping related to child care health and safety, use of health consultants, accident and injury prevention, immunizations, nutrition and food safety in child care settings. (Offered alternate summers.)

**2101. Special Topics In: 1-3 (Max. 6).** Provides freshman and sophomore level undergraduate students opportunities to pursue a class of special interest or of a timely subject in a selected family and consumer sciences area and for faculty to pilot lower division courses.

**2110. Fundamentals of Aging and Human Development. 3.** Discusses aging as a lifelong process, involving interrelationships of the individual and his or her environment. Includes future demographic trends, family health care, social policy and mass media.

**2121. Child Development. 4. [CS◀(none)]** Incorporates classroom instruction with laboratory application of child development research and theory in physical, intellectual and social/emotional domains. Emphasizes early childhood years. *Prerequisite:* sophomore standing.

**2122. Child Development Lab. 1.** Laboratory observation course designed for students with a background in child development theory. Students learn child observation techniques,

how to write laboratory reports, and how to apply them to evaluating a child's development in all domains. *Prerequisite:* PSYC 2300.

**2131. Family Relations. 3.** Provides an overview of current research on family relations, family theory, and family dynamics across the lifespan. An ecological and family systems approach is used, with particular focus paid to the understanding of contextual influences on families. *Prerequisites:* COJO 1030 or EDEC 1020 or PSYC 1000 or SOC 1000.

**2133 [3133]. Intimate Relationships. 3.** Use of social science theory and research to understand psycho-socio-cultural influences in the development of personal and intimate relationships including human sexuality from development and interpersonal perspectives. Emphasizes application of current research and theory to facilitate positive individual growth, satisfaction, and stability in close relationships. *Prerequisites:* PSYC 1000 or SOC 1000.

**2135. Women and Aging. 3.** Focuses on women and the aging process with emphasis given to both the problems and promises of aging. Topics to be explored within a multicultural, sociological framework include the definition of self, relationships, community, health and health care, work and service, retirement, economic realities and new perspectives on aging. Cross listed with WMST/SOC/NURS 2135. *Prerequisites:* ENGL/SOC/WMST 1080 or SOC 1000 or FCSC/NURS/SOC 2120.

**2170. Clothing in Modern Society. 3. [WB◀COM2]** Aesthetic, physical economics and socio-psychological elements of clothing selection. (Offered spring semester)

**2175. Fashion Illustration. 3.** Introduces the fashion figure, light and dark contrasts, color, fabric and texture sketching techniques. Computer applications for layout of the design are also covered. *Prerequisites:* FCSC 1180 or ART 1110. (Offered alternate spring semesters)

**2180. Housing. 3.** Cross-cultural examination of evolution of contemporary housing, both as an artifact of material culture, and as the environmental setting which affect human development and interaction. *Prerequisite:* WA. (Offered fall semester)

**2188. Interior Design I. 3.** Beginning interior design course. Helps students use design principles to create workable designs for interior spaces. *Prerequisites:* FCSC 1180 and sophomore standing. (Offered spring semester)

**2200. Professionalism and Communication in FCSC. 3. [(none)◀COM2]** An introduction to the field of Family and Consumer Sciences. Students will learn the history, approaches to problem solving using the body

of knowledge and systems theory. The course will focus on professionalism and communication strategies using our departmental competencies. *Prerequisites:* FCSC majors, FYS and COM1.

**3110. Personal Finance. 3.** Acquaints students with personal budgeting and financial matters and relate these activities to financial institutions involved. *Prerequisite:* junior standing.

**3119 [4119]. Parent-Child Relationships. 3.** Research and theory related to the processes of the parent-child relationship across the lifespan. Emphasizes developmental and family theory, contexts that influence parent-child relationships and application to professional practice. *Prerequisites:* FCSC 2121 or PSYC 1000 or EDST 2450; junior standing.

**3122 [4122]. Adolescence. 3.** Studies biological, cognitive, and social/emotional development and adjustment within the adolescent and emerging adulthood years. Emphasis on the importance of theoretically grounded research and the integration of theory, research, and practice during adolescence. *Prerequisites:* PSYC 2300 or EDST 2450 or FCSC 2110 or FCSC 2121.

**3129. Social Development in Young Children. 3.** Designed to provide professional child development and early childhood education majors with an opportunity to learn more about how to encourage healthy social development in young children. In addition, topics of self-esteem, emotional regulation, and secure attachment will be discussed in depth with regards to how they affect overall development. *Prerequisites:* FCSC 2121 or 2122.

**3140. Maternal, Infant and Adolescent Nutrition. 3.** Addresses factors affecting dietary patterns and practices as well as nutritional requirements prior to and encompassing pregnancy and lactation and continuing through infancy and adolescence. *Prerequisites:* FCSC 1140 or 1141, LIFE 1010, ZOO 3115.

**3145. Sports Nutrition and Metabolism. 3.** Discusses roles played by carbohydrate, fat, protein, water, and key vitamins and minerals as they relate to physical exercise. Applies principles of nutrition. *Prerequisites:* FCSC 1140 or 1141; one semester of Chemistry; ZOO 3115 or KIN 3021.

**3147. Community Nutrition. 3.** Provides an introduction to the field of community nutrition and develops an appreciation of the importance of nutrition in community health programs at the local, state, national, and international level. Topics covered include the role of the community nutritionist; the identification of nutrition problems; food insecurity;



nutrition policy; nutrition education; assessing community resources; and program planning and evaluation. *Prerequisites:* FCSC 1141; SOC 1000 or 1100.

**3150. Intermediate Foods. 2.** Examines food management concepts which include selection and preparation of food to meet physical, psychological, and social needs of individuals and families. *Prerequisites:* FCSC 1150, FCSC major, sophomore standing.

**3152 [4152]. Food Systems Production. 3.** Quantity food purchasing and production, along with institutional food services experience. *Prerequisites:* FCSC 3150 and LIFE 1010. (Offered fall semester)

**3170. Advanced Apparel Construction. 3.** Development of advanced apparel construction and tailoring techniques. Continued development of decision-making skills in selection, use and evaluation of materials. *Prerequisites:* FCSC 1170 and FCSC 3171. (Offered fall semester)

**3171 [2171]. Introductory Textile Science. 3.** Understanding of textile fibers, their growth or manufacture, properties and their use and care; the major yarn manufacturing systems (cotton, worsted, woolen, and synthetic yarn texturing) and fabric manufacturing systems (weaving, knitting, and non-wovens). Introduces the physical/mechanical properties important in fibers, yarns and fabrics. *Prerequisite:* completion of University Studies SP requirement. (Offered spring semester)

**3172. Textile Science Laboratory. 1.** Introduces techniques in fiber, yarn and fabric identification. Examination of physical properties of textile materials. *Prerequisite:* Concurrent enrollment in FCSC 3171.

**3173 [4173]. Visual Merchandising and Promotion. 3.** Covers the principles of fashion, consumer behavior as it relates to promotion activities, and non-personal selling techniques to include advertising, display, publicity, fashion shows, and special events. Students will be involved in actual hands-on experiences with many techniques. *Prerequisite:* FCSC 2188. (Offered fall semester)

**3174 [4170]. Flat Pattern Design. 3.** Principles and instructions for drafting pattern slopers through standard or individual measurements used to learn techniques of garment design using the flat pattern method are utilized to create three-dimensional designs. Computer applications to garment design are also covered. *Prerequisites:* FCSC 2175 and 3170. (Offered fall semester)

**3175. Apparel Design Through Draping. 3.** Draping garment patterns through fabric manipulation, molding, and shaping to create

three-dimensional form utilizing couture construction techniques. *Prerequisite:* FCSC 3174. (Offered spring semester)

**3184. Foundations of Merchandising I. 3.** Overviews the planning, developing and presentation of product lines in the apparel business. *Prerequisite:* ACCT 1010 or ECON 1010. (Offered alternate fall semesters)

**3220. Multicultural Influences on Children and Families. 3. [CS,D♦H]** Designed to enrich students' understanding of cultural contexts of children and families. Issues to be explored will include cultural values, learning styles, acquisition of concepts of race and ethnicity, bi-lingualism, the theory of bicultural/bicognitive development, and effective communication and problem-solving strategies that apply in multiple professional settings. *Prerequisites:* PSYC 1000, FCSC 2121, PSYC 2300 or FCSC 2131; and junior standing.

**4104. Field Studies in Family and Consumer Sciences. 1-3 (Max. 3).** Concentrated on-site study of family and consumer sciences-related businesses, agencies and organizations to better understand challenges and potentials of various career opportunities in family and consumer sciences. *Prerequisite:* junior standing. (Offered based on sufficient demand and resources)

**4105. Family and Consumer Sciences Internship. 6-8 (Max. 8).** Gives students experience in workplace related to selected family and consumer sciences options (i.e., retail store, social service agency and preschool or day care). *Prerequisites:* junior standing in family and consumer sciences and consent of instructor. (Offered all semesters)

**4106. Special Problems in Family and Consumer Sciences. 1-3 (Max. 8).** Provides advanced undergraduate students opportunities to pursue a topic of special interest in a selected family and consumer sciences area, under guidance of a department faculty member. *Prerequisites:* junior or senior standing and advanced consultation with department head and an instructor in subject matter area. (Offered all semesters)

**4112. Family Decision-Making and Resource Management. 3.** Utilizes theories to facilitate understanding of problem-solving and resource management in various family structures/contexts across the life span. Emphasizes internal family dynamics, global interdependence, critical thinking, cultural examination, ethical decision-making, and self-reflection. Designed to meet family studies requirement for license in marriage and family therapy at graduate level. Companion

web site used. Dual listed with FCSC 5112. *Prerequisites:* PSYC 1000 or SOC 1000 or COJO 1030 or 1040; junior standing. (Offered spring semester)

**4113. Consumer Issues. 3.** Provides research/applied understanding of consumer rights/responsibilities, government/business roles, legislation, advocacy, and redress. Emphasizes introductory consumer law/legal research, critical thinking, self-reflection, and cultural examination. Ethical theories and issues examined within an interdependent world. Meets requirements for certification in family and consumer sciences education. Internship opportunities possible upon successful completion. Companion web site used. *Prerequisites:* ECON 1000 or SOC 1000 or PSYC 1000, junior standing. (Offered fall semester)

**4117. Understanding Community Leadership. 3. [CS♦(none)]** Understanding Community Leadership. Introduces students to the scope and functions of professionals working in rural communities as leaders. Students will explore community dynamics, leadership skills and managing change, and understand the complexities of leadership within communities. Understanding communities and leadership increases the likelihood of success for community based professionals. Dual listed with FCSC 5117. *Prerequisites:* senior standing and satisfactory completion of a WB course. (Offered fall semester)

**4118. Family Policy. 3.** Explores the relationships between family functioning and public/private policies. The roles of family professionals in advocacy and education regarding policies will be discussed. Attention will be paid to the policy process at the state level. Dual listed with FCSC 5118. *Prerequisites:* FCSC 2131; junior standing. (Offered spring semester, odd years)

**4124. Families of Young Children With Special Needs. 3.** Deals with importance of including family in the process of early intervention with the preschool child with special needs. *Prerequisite:* FCSC 2121 OR PSYC 2300 AND junior/senior standing.

**4125. Professional Practices in Human Development and Family Sciences. 3.** Explores key issues related to professional practice in Human Development and Family Sciences. Particular attention is paid to skills and knowledge needed to work in community-based, prevention focused settings with individuals and families across the lifespan. *Prerequisites:* FCSC 2131; FCSC 2133; senior standing. (Offered fall semester)

**4127. Directing Preschool and Daycare Programs. 3. [WC♦(none)]** Effective methods for establishing and operating preschool and day-care programs for children under six years of age. Includes programming, classroom management, parent involvement and administration of food and nutrition programs. *Prerequisites:* FCSC 2121, EDEC 1020 or 3210; junior standing. (Offered fall semester)

**4130. Internship in Child Development. 6-8 (Max. 8).** Provides professional child development and early childhood education majors with an in-depth experience working with children from birth to age five. Students gain experience including planning lessons, teaching, assessing children and conducting parent conferences. *Prerequisites:* FCSC 2121; EDEC 3000; EDEC 3220 or EDEC 4320; senior standing. (Offered all semesters)

**4131. Administration Internship in Child Development. 6-8 (Max. 8).** Provides professional child development and early education majors with an in-depth experience working with families and staff. Students gain experience in observing and assessing early childhood programs, planning and presenting staff trainings/professional workshops, staff supervision, writing newsletters, and other professional documents and professional activities. *Prerequisites:* FCSC 2121; FCSC 4127; EDEC 3220 or EDEC 4320. (Offered all semesters)

**4132. Internship in Human Development and Family Sciences. 6-8 (Max. 8).** Acquire skills and gain familiarity in direct services, policy development, or program planning in a human services agency/organization. Opportunities to apply theories and knowledge gained in classroom settings to professional practice will be provided. *Prerequisites:* FCSC 4125; consent of instructor; senior standing. (Offered spring and summer semesters)

**4138. Family Stress and Coping. 3.** Theoretical and empirical research on family stress, coping and resiliency is emphasized as well as the study of normative stressors and crisis in the lives of individuals and families. Attention is paid to the application of theory and research to professional practice. Dual listed with FCSC 5138. *Prerequisites:* FCSC 2131; junior standing. (Offered spring semester)

**4142. Nutrition and the Elderly. 1.** Studies nutrition requirements in elderly as affected by physiological changes with aging; covers special problems and food assistance programs for the elderly. *Prerequisites:* FCSC 1140 or 1141; LIFE 1010. (Offered fall semester)

**4145. Advanced Nutrition. 4.** Discusses functions of components of diet in human metabolism. Applies principles of nutrition.

Dual listed with FCSC 5145. *Prerequisites:* FCSC 1140 or 1141; CHEM 2300; senior standing. (Offered fall semester)

**4147. Nutrition and Weight Control. 3.** Advanced course in physiological and metabolic determinants of weight control emphasizing pathology, psychodynamics, assessment and treatment of obesity. Dual listed with FCSC 5147. *Prerequisites:* FCSC 1140 or 1141; ZOO 3115. (Offered spring semester)

**4150. Experimental Foods. 3.** Studies physical and chemical properties of raw and processed food materials and tests for evaluation of food quality. Students develop ability to use and interpret recent research findings, as well as skills in planning, conducting and reporting food experiments. *Prerequisites:* FCSC 1150, CHEM 2300, STAT 2020, ENGL 4010, FCSC major. (Offered spring semester)

**4171. Advanced Textiles. 3.** Introduces color science as related to human perception and practical problems to the textile industry. Studies different types of dyes available, fibers to which they are applied and properties of dyes. Introduces various finishing techniques used for textiles. *Prerequisite:* CHEM 1000 and FCSC 3171. (Offered fall semester)

**4174. Foundations of Merchandising II. 3.** Overviews fashion merchandising and retailing. *Prerequisite:* FCSC 3184 and QA. (Offered alternate fall semesters)

**4175. Textile Testing and Product Analysis. 3.** Explains meaning of quality control and why it is important. Discusses variety of laboratory tests and standards available to assess the various aspects of textile/apparel quality. Examines performance specifications of textile materials to determine if they are suitable for desired end uses. Dual listed with FCSC 5175. *Prerequisites:* FCSC 3170 and 4171. (Offered alternate spring semesters)

**4176. Historic Clothing. 3.** Surveys history of clothing in the Western World. Includes information from approximately 3000 B.C. through the 20th century. Dual listed with FCSC 5176. *Prerequisite:* FCSC 2170. (Offered alternate spring semesters)

**4178. Fiber Arts. 3 (Max 6).** Development and enhancement of technical and creative apparel construction/design skills culminating in the creation of a distinctive piece of wearable art. Dual listed with FCSC 5178. *Prerequisite:* FCSC 3174. (Offered spring semester)

**4181. Global Textiles Marketplace. 3. [G♦(none)]** Discusses global textile industry, how the U.S. fits into the global industry, textiles and apparel trade policy, as well as balancing conflicting interests in the world

marketplace. Dual listed with FCSC 5181. *Prerequisite:* FCSC 3171. (Offered alternate spring semesters)

**4182. Textile Industry and the Environment. 3. [WC♦COM3]** Examines the environment, the impact of the textile industry on the environment, and issues facing the textile industry to provide more environmentally friendly products. Dual listed with FCSC 5182. *Prerequisite:* completion of USP WB requirement, FCSC 3171. (Offered alternate spring semesters)

**4188. Interior Design II. 3.** Advanced study of space planning and interior design as applied to contract design problems. Architectural design and rendering software used to visualize and present interior design solutions. Explores ideas of sustainable, accessible and functional design for the public. Dual listed with FCSC 5188. *Prerequisite:* FCSC 2188. (Offered fall semester)

**4210. Therapeutic Nutrition I: Nutrition Assessment and Diagnosis. 4.** Nutrition assessment and diagnosis as part of the nutrition care process; experience in dietary and nutrient assessment of the apparently healthy and sick individual with discussion of case studies. *Prerequisites:* Senior Standing; ZOO 3115; MOLB 3610; FCSC 4145 or concurrent enrollment.

**4220. Therapeutic Nutrition. 4.** Rationale for dietary modifications in pathological conditions; experience with learning and applying the nutrition care process to develop nutrition care plans for individuals with various medical conditions with discussion of case studies. *Prerequisites:* FCSC 4210; MOLB 4100 or concurrent enrollment.

**4230. Therapeutic Nutrition Counseling. 2.** Course is designed to help students develop basic nutrition counseling and communication skills. Students will learn how to apply the concepts learned during lecture through interactive classroom experiences with peers and outside of the classroom experiences with an assigned client. *Prerequisites:* FCSC 4220 or concurrent enrollment; Dietetics students only.

**4346. Clinical Practicum in Dietetics. 1.** Concentrated clinical practicum designed to provide dietetic majors with experience in the institutional, practitioner and clinical settings. *Prerequisite:* FCSC 4146 or concurrent enrollment; Enrollment is limited to Dietetics majors only.

**4350. Health Management Issues in Early Education. 3.** Provides the student the opportunity to examine the implications of a child's health status on his/her personal, educational, social and cognitive development. Provides personnel working closely with the young

child with disabilities and his/her family an understanding of the issues related to health concerns and a framework on concerns specific to the child in a day care, preschool or other school setting. *Prerequisites:* junior or senior standing, 6 hours of education and/or the consent of instructor.

**4546. Agriculture: Rooted in Diversity. 3. [C,D] (none)** Addresses multiple themes related to diversity in agriculture with the goal of making visible the experiences of minorities and women in agriculture. Involves significant independent research, class discussion, project development, and development of oral and written communication skills. Establishes linkages with supporting disciplines. Cross listed with ENGL/AIST/CHST/AGRI/AMST/HIST 4546. *Prerequisites:* Junior class standing or consent of instructor and concurrent enrollment or major in any of the following: ethnic studies, agriculture, American studies, anthropology, English, history, sociology, or women's studies.

**4960. Textiles Field Study Tour. 1-3 (Max. 6).** Designed to provide students an opportunity to visit designer show rooms, textile manufacturers, museums, and historic/cultural sites. Serves both undergraduate and graduate students with an interest in textile and apparel design, history, and merchandising. *Prerequisites:* WA and consent of instructor. (Offered based on sufficient demand and resources every other spring/summer term, odd years)

**4970. Design and Merchandising Internship. 3 (Max. 6).** Provides practical experience in retail, interior design or apparel design settings. *Prerequisite:* FCSC 3173.

**4985. Seminar: Development in Community Leadership. 2-3.** Emphasizes basic core components of individual leadership: assessment of leadership skill and style; community-based experiences for understanding of community and resources; group community development projects for students; engagement with others and the community. Upon completion, students understand various leadership styles and philosophies and articulate their personal leadership philosophy. Dual listed with FCSC 5985. *Prerequisites:* senior or post-graduate equivalent status and consent of instructor.

**5101. Special Topics in Family and Consumer Sciences. 1-3 (Max. 6).** Intended to accommodate a seminar series and a course offering by visiting faculty whose subject matter is not included in other course offerings.

**5102. Special Problems. 1 - 12 (Max. 18).** Study in a selected problem area for broader perspective or greater specialization in the stu-

dent program. *Prerequisite:* advanced or graduate standing and consultation with department head and instructor in subject matter area.

**5103. Graduate Seminar in Family and Consumer Sciences I. 1.** Integrative Seminar in Family and Consumer Sciences. Students are exposed to faculty research, discuss common readings and present their own research. Offered S/U only for those taking Graduate Seminar I and students will be taking Graduate Seminar II for a letter grade. *Prerequisite:* graduate student standing.

**5104. Graduate Seminar in Family and Consumer Sciences II. 1.** Integrative seminar in Family and Consumer sciences. Students are exposed to faculty research, will discuss common readings, and will present their own research. Graduate Seminar II can only be taken for a letter grade. *Prerequisite:* FCSC 5103.

**5107. Family and Consumer Sciences Extension Practicum. 8.** To provide experience in county extension programs. *Prerequisites:* AGRI 4010, advanced standing and consent of instructor.

**5112. Family Decision and Resource Management. 3.** Utilizes theories to facilitate understanding of problem-solving and resource management in various family structures/contexts across the life span. Emphasizes internal family dynamics, global interdependence, critical thinking, cultural examination, ethical decision-making, and self-reflection. Designed to meet family studies requirement for license in marriage and family therapy at graduate level. Companion website used. Dual listed with FCSC 4112. *Prerequisites:* graduate standing. (Offered spring semester)

**5113. Consumer Issues. 3.** Provides research/applied understanding of consumer rights/responsibilities, government/business roles, legislation, advocacy, and redress. Emphasizes introductory consumer law/legal research, critical thinking, self-reflection, and cultural examination. Ethical theories and issues examined within an interdependent world. Meets requirements for certification in family and consumer sciences education. Internship opportunities possible upon successful completion. Companion website used. Dual listed with FCSC 4113. *Prerequisites:* graduate standing. (Offered fall semester)

**5114. Lifespan Human Development. 3.** An overview of human growth and development throughout the life span, with an emphasis on major theories, conceptual issues, research findings, and practical applications for professionals working in health care, human service and educational environments. *Prerequisite:* PSYC 1000 or FCSC 2121.

**5117. Understanding Community Leadership. 3.** Understanding Community Leadership. Introduces students to the scope and functions of professionals working in rural communities as leaders. Students will explore community dynamics, leadership skills and managing change, and understand the complexities of leadership within communities. Understanding communities and leadership increases the likelihood of success for community based professionals. Dual listed with FCSC 4117. *Prerequisite:* graduate standing.

**5118. Family Policy. 3.** Explores the relationships between family functioning and public/private policies. The roles of family professionals in advocacy and education regarding policies are discussed. Attention is paid to the policy process at the state level. Dual listed with FCSC 4118. *Prerequisite:* graduate standing. (Offered alternate spring semesters)

**5120. Infancy and Toddlerhood. 3.** Examines development and behavior, focusing on a broad range of topics which includes: physical development, prenatal influences, sensory processes, biological factors, cognitive development, language development, social interaction and relationship. A broad family and consumer sciences perspective (the family in its environment) are applied. *Prerequisite:* FCSC 2121 or equivalent course in child development.

**5121. Ethics in Research and Professional Practice. 3.** Includes ethical theories, responsible conduct of research and professional practice defined by government, professional organizations, journals, and employers. Concepts include plagiarism, fabrication, falsification, conflict of interest, and conflict of commitment, and institutional review boards protecting human subjects. Concepts will be applied to research and professional practice in different settings. *Prerequisite:* acceptance into a graduate program.

**5122. Developmental Contexts Across the Lifespan. 3.** A variety of contexts in which children, adults, and families live and develop. Attention is given to the constant interactions that occur between humans and their environments, as well as how different environments may foster or hinder development. Includes discussions of the practical, professional and political implications of contextual research. *Prerequisite:* graduate standing.

**5129. Seminar in Child Development. 3.** Advanced study of the cognitive, social-emotional, communicative, moral, and physical/motor development of children and adolescents, with an emphasis on cultural and contextual influences on development. *Prerequisites:* graduate standing, WC and one of the following: FCSC 2121, PSYC 2300, FCSC 3220, EDST 2450.

**5132. Seminar in Family Studies. 3.** Provides an in-depth examination of: guiding theories in family studies; the purpose and methods of theory-building; and current research in major topical areas of family science and family and consumer science are compared. *Prerequisites:* 6 hours of undergraduate family related courses and consent of instructor.

**5137. Individual and Family Assessment. 3.** An introduction to both quantitative and qualitative methods of assessing children, adults, couples and families; observational approaches to assessing individuals and families; and interpretation of commonly used tests and measures. *Prerequisite:* STAT 5010.

**5138. Family Stress/Coping. 3.** Theoretical and empirical research on family stress, coping and resiliency is emphasized as well as the study of normative and nonnormative stressors and crises in the lives of families. Attention is paid to professional practice applications. Dual listed with FCSC 4138. *Prerequisite:* graduate standing.

**5140. Nutritional Aspects of Proteins and Amino Acids. 3.** Advanced study of protein and amino acid metabolism in various physiological conditions. *Prerequisites:* MOLB 3610 or equivalent; FCSC 4145 or equivalent.

**5141. Carbohydrate and Ethanol Metabolism. 3.** Advanced study of carbohydrate and ethanol metabolism in various physiological conditions. *Prerequisites:* MOLB 3610 or equivalent; FCSC 4145 or equivalent.

**5142. Nutritional Research Techniques. 2.** Techniques for nutrient analysis of body fluids and tissues, assessing nutrient status of populations, and methods for animal studies in nutrition instrumentation. *Prerequisite:* FCSC 4145/5145.

**5144. Lipids II. 3.** Examines lipoprotein metabolism and how it is influenced by alterations in diet composition. This area is followed by sections on prostaglandin and leukotriene biosynthesis and the regulatory role of these eicosanoids. *Prerequisite:* FDSC 5770.

**5145. Advanced Nutrition. 4.** Discusses functions of components of diet in human metabolism. Applies principles of nutrition. Dual listed with FCSC 4145. *Prerequisite:* graduate standing.

**5147. Nutrition and Weight Control. 3.** Advanced course in physiological determinants of weight control emphasizing pathology, psychodynamics, assessment, and treatment of obesity. Dual listed with FCSC 4147. *Prerequisite:* graduate standing.

**5150. Experimental Foods. 3.** Studies physical and chemical properties of raw and processed food materials and tests for evalu-

ation of food quality. Students develop ability to use and interpret research findings, as well as skills in planning, conducting, and reporting food experiments. Dual listed with FCSC 4150. *Prerequisite:* graduate standing.

**5151. Sensory Analysis. 1.** Examines the principles and techniques applied to the subjective evaluation of food. *Prerequisites:* graduate standing; STAT 5080.

**5172. Advanced Textile Chemistry. 3.** A study of the chemistry of amino acids and proteins, especially silk and wool; the photochemistry of dyes and fibers; the physical chemical concepts of dyeing.

**5173. Textile Science Seminar. 3.** Advanced study of textile science, physical and chemical modification of fibers, developments in dyeing and finishing technology. Environmental aspects of textile technology. Extensive use of current literature is utilized.

**5175. Textile Testing and Product Analysis. 3.** Explains meaning of quality control and why it is important. Discusses variety of laboratory tests and standards available to assess the various aspects of textile/apparel quality. Examines performance specifications of textile materials to determine if they are suitable for desired end uses. Dual listed with FCSC 4175. *Prerequisite:* graduate standing. (Offered alternate spring semesters)

**5176. Historic Clothing. 3.** Surveys history of clothing in the Western World. Course content includes information from approximately 3000 BC through the 20th century. Dual listed with FCSC 4176. *Prerequisite:* graduate standing. (Offered alternate spring semesters)

**5178. Fiber Arts. 3.** Development and enhancement of technical and creative apparel construction/design skills culminating in the creation of a distinctive piece of wearable art. Dual listed with FCSC 4178. *Prerequisite:* graduate standing. (Offered spring semester)

**5179. Historic Textiles. 3.** History of all major textile industries is explored. Processes and technical terms are explained. The role and impact of textiles in western economies and societies are examined. *Prerequisite:* graduate standing. (Offered alternate fall semesters)

**5181. Global Textiles. 3.** To gain an understanding of the global textile industry, how the U.S. fits into the global industry, textiles and apparel trade policy and balancing conflicting interests in the world market place. Dual listed with FCSC 4181. *Prerequisite:* graduate standing. (Offered alternate spring semesters)

**5182. Textile Industry Environment. 3.** Examines the environment, the impact of the textile industry on the environment, and issues facing the textile industry to provide

more environmentally friendly products. Dual listed with FCSC 4182. *Prerequisites:* completion of USPWB requirement, FCSC 3171. (Offered alternate spring semesters)

**5188. Interior Design II. 3.** Advanced study of space planning and interior design as applied to contract design problems. Architectural design and rendering software used to visualize and present interior design solutions. Explores ideas of sustainable, accessible and functional design for the public. Dual listed with FCSC 4188. *Prerequisite:* graduate standing.

**5890. Seminar in Food Science and Nutrition. 1.** A seminar course on topics in food science and human nutrition. Cross listed with FDSC 5890. *Prerequisite:* graduate standing.

**5900. Practicum in College Teaching. 1-3. (Max 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrollment in a graduate degree program.

**5961. Graduate Projects. 1-4 (Max. 4).** Limited to those students enrolled in a Plan B graduate program. Students should be involved in non-course scholarly activities in support of their Plan B project. *Prerequisite:* must be enrolled in a Plan B program and have departmental approval.

**5985. Development of Community Leadership. 2-3 (Max 98).** Emphasizes basic core components of individual leadership: assessment of leadership skill and style; community based experiences for understanding of community and resources; group community development projects for student engagement with others and the community. Upon completion of course, students will understand various leadership styles and philosophies and articulate their personal leadership philosophy. Dual listed with FCSC 4985. *Prerequisites:* senior or post graduate equivalent status and consent of instructor.

**5990. Internship. 1 - 12. (Max 24).** *Prerequisite:* graduate standing.

## Life Sciences Program

138 Aven Nelson Building, 766-4158

FAX: (307)766-2851

Web site: [www.uwyo.edu/lifescience](http://www.uwyo.edu/lifescience)

Program Director: Mark E. Lyford

The Life Sciences Program consists of all LIFE prefix courses. These courses support the life science majors and several non-life science majors across campus. The number of LIFE courses taken by life science and other majors is determined by the departments that offer the majors. The curriculum intends to provide life-science majors with both breadth and depth in the basic life sciences, and non-science majors with exposure to key concepts in biology and an understanding of the connections between science and society. The program courses also expose students to the fields of cell and molecular biology, genetics, ecology, and evolution, and they familiarize students with the diversity of life on the planet. Courses within the curriculum address four fundamental goals at a level appropriate for each course: 1) Acquisition, Application and Synthesis of Knowledge, 2) Communication Skills, 3) Critical Thinking and Problem Solving, and 4) Research Skills.

For information on LIFE course offerings, please refer to the Life Sciences Program entry in the College of Arts and Sciences.

## Microbiology Program

5004 Agriculture Building 766-3139

FAX: (307) 766-3875

E-mail: [gandrews@uwyo.edu](mailto:gandrews@uwyo.edu)

Program Director: Dr. Gerard Andrews

The bachelor of science degree program in microbiology is organized as an interdepartmental major involving the collaborative teaching, advising, and research expertise of more than 20 microbiology faculty from the Colleges of Agriculture, Arts and Sciences, and Health Sciences. The program is administered by a program director and a coordinating committee which represent each of the participating colleges. Students may obtain their degree in either the College of Agriculture and Natural Resources or the College of Arts and Sciences. Students interested in obtaining their degree through the College of Arts and Sciences should refer to that college's section for additional information regarding college requirements. Students interested in obtaining their degree through the College of Agricul-

ture and Natural Resources should contact the program director or members of the coordinating committee directly for more information or formal academic advising within the program. Additional information about the microbiology program may be obtained at the following web site address: [www.uwyo.edu/agcollege/micro/microhome.htm](http://www.uwyo.edu/agcollege/micro/microhome.htm).

Students pursuing a major in microbiology must be advised by one of the following participating faculty members of the interdepartmental Microbiology Steering Committee:

GERRY ANDREWS, Veterinary Sciences

BLEDAR BISHA, Animal Sciences

JASON GIGLEY, Molecular Biology

MARK GOMELSKY, Molecular Biology

KUMARAN MANI, Molecular Biology

KURT W. MILLER, Molecular Biology

MYRNA MILLER, Veterinary Sciences

KERRY SONDEGROTH, Veterinary Sciences

PETER D. STAHL, ESM

DANIEL WALL, Molecular Biology

RACHEL WATSON, Molecular Biology

Microbiology is the study of life forms too small to be observed without the aid of magnification; major groups of microbes include the bacteria, fungi (yeasts and molds), protozoa, and algae, as well as the viruses. In addition, related disciplines such as immunology and molecular biology are included because of their historical origins within microbiology.

As such, the science of microbiology is divided into numerous subspecialty areas that reflect not only the individual groups of microbes (e.g., bacteriology, virology, mycology, etc.), but also their significance in applied areas (e.g., medical microbiology/infectious diseases, microbial ecology, food microbiology, industrial microbiology, biotechnology, etc.) or in areas of basic science (e.g., molecular genetics). Throughout its history, microbiology has played a key role in the development of our understanding of basic biochemical and genetic processes, control of infectious diseases, production of increased and improved food supplies, and the production of numerous commercial products. With the development of molecular techniques to construct genetically engineered microbes, microbiologists will continue to make expanding contributions in these and other areas.

Because microbiology is a diverse science, individuals trained as microbiologists find exciting career opportunities in many areas of the basic and applied sciences. Typically, microbiologists are employed in five major sectors: private industry; clinical laboratories; government agencies; universities; and various

other settings such as water treatment, food production/inspection facilities, and other public health-related areas. Recent manpower assessment studies at both the national and regional levels have provided evidence for a continuing and expanding need for microbiologists such that successful undergraduate students completing this program may look forward to exciting careers. In addition, undergraduates trained in the microbiological sciences are well prepared for competitive application to graduate school programs and professional programs in human or veterinary medicine, optometry or dentistry.

The microbiology curriculum is organized to provide students with the maximum flexibility in meeting their university studies program requirements. In addition, the curriculum is designed to prepare graduates for the future by combining a firm foundation in the basic sciences with a central core of microbiology classes, followed by the opportunity for students to specialize in areas of microbiology suiting their individual interests via the selection of electives. Prior to graduation, microbiology majors must complete the basic requirements and all microbiology core course requirements as listed below. Finally, to assure breadth of exposure in microbiology, students must complete 6 semester hours of microbiology electives.

### Basic Course Requirements for Microbiology Majors

Total credit hours..... 128

3000-level or above credits

(university requirement) ..... 42 hours

Completion of University Studies 2003

Program Requirements..... 30-36 hours

### Basic sciences and quantitative reasoning

MATH 1450, or 1400 and 1405,

or 2200 .....4-6

STAT 2050 .....4

LIFE 1010 and 2022 or 2023 .....8

LIFE 3050 .....4

CHEM 1020 and 1030 .....8

CHEM 2420 and 2440 .....4-8

PHYS 1110 and 1120 .....4-8

MOLB 3000 .....3

MOLB 3610 or 4600 and 4610.....4-6

### Microbiology Core Course Requirements

MICR/MOLB 2021 or 2240 .....4-5

PATB 2220 .....4

MOLB 4440 .....3

PATB/MOLB 4400 .....4

PATB 4710 .....3

MOLB 4460 .....3

MOLB 4170 .....1

MOLB 4250 .....1

PATB 4150, or MOLB 4050 (or 4052)....1(x2)  
MICR Electives.....6

### Microbiology Electives

In addition to completing the required microbiology courses listed above, students must complete 6 hours of microbiology electives from any of the following lists.

#### Medical Microbiology

PATB 4001, Epidemiology .....3  
PATB 4110, Diseases of Food Animals and Horses .....3  
PATB 4120, Diseases of Wildlife.....3  
PATB 4130, Mammalian Pathobiology .....3  
PATB 4140, Toxicology .....3  
PATB 4200, Diagnostic Bacteriology .....1  
PATB 4360, Parasitology.....4  
PATB 4500, Veterinary Parasitology.....3  
PATB 4220, Molecular Pathogenesis.....3  
PHCY 4450, Pathophysiology .....4  
ZOO 4110, HIV and AIDS.....3

#### Molecular and Cell Biology

LIFE 3600, Cell Biology .....4  
MOLB 4180, Protein Isolation and Characterization.....1  
MOLB 4260, Quantitative Microscopy.....1  
MOLB 4450, Developmental Genetics.....3  
MOLB 4670, Adv. Molecular Cell Biology...3

#### Environmental and Applied Microbiology

BOT 4300, Mycology.....4  
BOT 4390, Fungal Physiology .....3  
MOLB 4540, Micro. Taxonomy.....3  
SOIL 4140, Soil Microbiology.....4  
PLNT 3220, Plant Pathology .....3  
PLNT 4000, Plant Disease Control .....3  
FDSC 4090, Food Microbiology .....3  
FDSC 4100, Food Microbiology Lab.....1

\*\*\*Students pursuing the B.S. degree in microbiology who wish to pursue a dual major in both microbiology and molecular biology must satisfy the basic science/math and core/elective requirements in microbiology as well as those specified for the B.S. degree in molecular biology PLUS an additional 9 credits of electives in microbiology and/or molecular biology at the 4000/5000 level

### Microbiology (MICR)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**2021 [2210]. General Microbiology. 4.** Introduces nature and diversity of microorganisms and their implications for all of biology. Covers comparative properties of eukaryotic and prokaryotic microbes, as well as their roles as disease agents, ecological agents and model

systems for understanding of fundamental biological processes at the molecular level. Cross listed with MOLB 2021. *Prerequisites:* LIFE 1010, CHEM 1000 or equivalent.

**2220. Pathogenic Microbiology. 4.** Covers major communicable diseases of man caused by bacteria, mycoplasma. Discusses disease, diagnosis, treatment, prevention and transmission. Cross listed with PATB 2220. *Prerequisite:* MICR 2210.

**2240. Medical Microbiology. 5.** Designed primarily for nursing and pre-pharmacy majors, introduces students to microbiology, including the diversity of prokaryotic and eucaryotic microbes, their structural and physiological properties, and their applied medical significance; also covers the basic principles of the immune system and emphasizes the communicable diseases of man caused by microbial pathogens. Cross listed with MOLB 2240. *Prerequisite:* LIFE 1010.

**4001. Epidemiology (Diseases in Population). 3.** Basic epidemiologic concepts and approaches to population problems in medicine, with examples from veterinary and human health. Covers a wide spectrum of topics and introduces practical applications of epidemiology. Dual listed with MICR 5001; cross listed with PATB 4001. *Prerequisite:* STAT 2050.

**4090. Food Microbiology. 3.** Discusses micro-organisms and theory of their growth and survival in relation to spoilage and preservation of foods and health hazards in foods. Cross listed with FDSC 4090. *Prerequisite:* MOLB 2210.

**4100. Food Microbiology Lab. 1.** Lab techniques used in food microbiology. Cross listed with FDSC 4100. *Prerequisite:* FDSC 4090 or 5090, taken concurrently.

**4130. Mammalian Pathobiology. 3.** Anatomical basis of disease in mammals. Emphasis on concepts of pathogenesis of disease, and the gross, microscopic and clinicopathological changes associated with lesions: cell injury and death; cellular degeneration; disturbances of growth and circulation; neoplasia; inflammation; and recognition of gross and microscopic tissue changes. Background in immunology will be beneficial. Dual listed with MICR 5130; cross listed with PATB 4130. *Prerequisite:* C or better in LIFE 2022.

**4140. Soil Microbiology. 4.** Fundamental principles of soil microbiology and how they relate to microbial ecology, environmental contamination, agriculture and forestry. Dual listed with MICR 5140; cross listed with SOIL 4140. *Prerequisite:* SOIL 2010.

**4200. Diagnostic Bacteriology. 1.** Practical training with emphasis on diagnostic procedures used in a clinical microbiology labora-

tory. Students identify bacterial pathogens of animals and humans. Taught in a clinical setting utilizing selected clinical material. Techniques employed in the processing and identification of clinically significant bacteria are used and discussed. Safe laboratory practices for working with biohazards are presented. Cross listed with PATB 4200. *Prerequisites:* junior standing and a MICR course which included a laboratory.

**4220. Molecular Mechanisms of Bacterial Pathogenesis. 3.** Intended for students majoring in microbiology or a related field. The class will consist of lectures and small group decisions. Student responsibilities will include note-taking and preparation for discussion by completion of reading assignments consisting of classic and/or recent journal articles addressing the weekly topic. Cross listed with PATB 4220; dual listed with MICR 5220. *Prerequisites:* PATB/MICR 2220 and statistics (or epidemiology).

**4250. Bacterial Genetics Laboratory. 1.** Introduces genetic manipulations of bacteria using molecular genetic techniques. Cross listed with MOLB 4250. *Prerequisites:* MOLB 2021, MOLB 3000, and LIFE 3050.

**4321. Microbiology Capstone. 3. [(none) ♦COM3]** Using a problem-based student learning model, students conceptualize, propose, perform and present a microbiology research study to address a real community problem. Students maintain a lab notebook, write an NSF-style research proposal, formulate hypotheses, engage in hands-on laboratory hypothesis testing and design and present a scientific poster. *Prerequisite:* MICR majors with junior or senior standing.

**4360. Medical Entomology and Parasitology. 4.** Emphasis on medically important arthropods, protozoa, and worms; clinical effects of infection epidemiology avoidance/control and identification/diagnosis. PATB/ENTO 4360. *Prerequisite:* 8 hours of biological science.

**4440. Microbial Genetics. 3.** Discusses microbial genetic approaches to study cell function and provides a molecular foundation for understanding how genes work to elicit phenotypes. Dual listed with MICR 5440; Cross-listed with MOLB 4440. *Prerequisites:* MOLB 2021 and 3000 and LIFE 3050. (Normally offered spring semester).

**4460. Microbial Physiology. 3.** Studies life processes of microbes as mediated by their structures acting in consort, in response to changing environments. Cross listed with MOLB 4460. *Prerequisites:* MOLB 2021 or MOLB 2240 or MICR 2021 or MICR 2240, and MOLB 3610 or MOLB 4610. (Normally offered fall semester).

**4500. Veterinary Entomology and Parasitology. 3.** Biology, importance and control of arthropod, helminth and protozoan parasites of food and companion animals. Diagnosis and identification of live and preserved specimens. Cross listed with ENTO 4500. Cross listed with PATB/ENTO 4500. *Prerequisite:* 8 hours of biological science.

**4510. Introductory Virology. 3.** Prokaryotic and eukaryotic viruses as infectious agents and models for modern molecular biology. Examines concepts and principles of pathogenesis, host response and the regulation of virus-host interactions. Genome organization, structure and replication are examined within the context of the co-evolution of virus and host. Cross listed with MOLB 4510. *Prerequisites:* MOLB 3610 or MOLB 4600 plus MOLB 4610.

**4540. Microbial Diversity and Ecology. 4.** Introduces the diversity and ecology of soil microbes through an integrated lecture and laboratory course. Emphasis on molecular approaches to analyzing microbial diversity and evolution, and student-directed experimental design. Provides a continuum of realistic research experiences in molecular microbial ecology, from field work to evolutionary analysis of DNA sequence data. Cross listed with MOLB 4540, ECOL 4540. *Prerequisite:* MOLB 2021.

**4710. Medical Virology. 3.** Human and animal viruses as biological entities. Methods of study, classification, replication strategies, diagnostic approaches, epidemiology and significance as disease agents. Cross listed with PATB 4710. *Prerequisite:* MOLB 2220 or MOLB 2240.

**5001. Epidemiology (Diseases in Population). 3.** Basic epidemiologic concepts and approaches to population problems in medicine, with examples from veterinary and human health. Covers a wide spectrum of topics and introduces practical applications of epidemiology. Dual listed with MICR 4001; cross listed with PATB 5001. *Prerequisite:* STAT 2050.

**5130. Mammalian Pathobiology. 3.** Anatomical basis of disease in mammals. Emphasis on concepts of pathogenesis of disease, and the gross, microscopic and clinicopathological changes associated with lesions: cell injury and death; cellular degeneration; disturbances of growth and circulation; neoplasia; inflammation; and recognition of gross and microscopic tissue changes. Background in immunology will be beneficial. Dual listed with MICR 4130; cross listed with PATB 5130. *Prerequisite:* C or better in LIFE 2022.

**5140. Soil Microbiology. 4.** Fundamental principles of soil microbiology and how they relate to microbial ecology, environmental

contamination, agriculture and forestry. Dual listed with MICR 4140; cross listed with SOIL 5140. *Prerequisite:* SOIL 2010.

**5220. Molecular Mechanisms of Bacterial Pathogenesis. 3.** Intended for students majoring in microbiology or a related field. Consists of lectures and small group decisions. Student responsibilities include note-taking and preparation for discussion by completion of reading assignments consisting of classic and/or recent journal articles addressing the weekly topic. Dual listed with MICR 4220; cross listed with PATB 4220/5220. *Prerequisites:* PATB/MICR 2220 and statistics (or epidemiology).

**5440. Microbial Genetics. 3.** Discusses microbial genetic approaches to study cell function and provides a molecular foundation for understanding how genes work to elicit phenotypes. Dual listed with MICR 4440; Cross-listed with MOLB 5440. *Prerequisites:* MOLB 2021 and 3000 and LIFE 3050. (Normally offered spring semester).

## Department of Molecular Biology

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Department Chair: Mark M. Stayton

### Professors

**DAVID FAY**, B.S. Tufts University 1988; Ph.D. Yale University 1995; Professor of Molecular Biology 2010, 2001.

**MARK GOMELSKY**, B.S. Moscow Institute of Chemical Technology 1986; M.S. 1988; Ph.D. Institute of Genetics and Selection of Industrial Microorganisms 1991; Professor of Molecular Biology 2011, 1999.

**DONALD L. JARVIS**, B.S. Idaho State University 1978; M.S. 1980; Ph.D. Baylor College of Medicine 1986; Professor of Molecular Biology 2000, 1998.

**KURT W. MILLER**, B.S. Pennsylvania State University 1977; Ph.D. Boston University 1982; Professor of Molecular Biology 2007, 1992.

**DON ALLEN ROTH**, B.S. University of New Hampshire 1974; M.S. Virginia Polytechnic Institute and State University 1975; Ph.D. 1978; Professor of Molecular Biology and Pharmacy 2009, 1978; Deputy Director of the School of Energy Resources.

**ANNE W. SYLVESTER**, B.S. University of Washington 1980; M.S. 1982; Ph.D. 1987; Professor of Molecular Biology 2010, 2006.

**PETER E. THORSNESS**, B.A. Colorado College 1982; Ph.D. University of California-Berkeley 1987; Professor of Molecular Biology 2002, 1991.

**CYNTHIA WEINIG**, B.A. Brown University 1991; Ph.D. Indiana University; Professor of Botany and Molecular Biology 2013, 2007.

### Associate Professors

**PAMELA J. LANGER**, B.S. Indiana University-Indiana 1973; Ph.D. Massachusetts Institute of Technology 1980; Associate Professor of Molecular Biology 1994, 1987.

**MARK M. STAYTON**, B.S. University of Missouri at Kansas City 1975; Ph.D. Iowa State University 1980; Associate Professor of Molecular Biology 1994, 1988.

**DANIEL WALL**, B.A. Sonoma State University 1988; Ph.D. University of Utah 1994; Associate Professor of Molecular Biology 2013, 2007.

**NAOMI WARD**, B.Sc. University of Queensland 1993; Ph.D. University of Warwick 1997; Associate Professor of Molecular Biology and Botany 2013, 2007.

### Assistant Professors

**GRANT BOWMAN**, B.S. University of Rochester 1997; Ph.D. University of Chicago 2004; Assistant Professor of Molecular Biology 2012.

**JESSE C. GATLIN**, B.S. University of Colorado-Boulder 1995; Ph.D. University of Colorado-Aurora 2005; Assistant Professor of Molecular Biology 2010.

**JASON GIGLEY**, B.S. University of New Hampshire 1994; Ph.D. Dartmouth Medical School 2007; Assistant Professor of Molecular Biology 2012.

**DANIEL L. LEVY**, B.S. California Institute of Technology 2000; Ph.D. University of California San Francisco 2006; Assistant Professor of Molecular Biology 2011.

### Adjunct Professors

**DAVID A. LIBERLES**, B.S. B.A. Oberlin College 1991; M.S. California Institute of Technology 1995; Ph.D. 1997; Associate Professor of Molecular Biology 2010, 2005.

**HERMANN SCHÄTZL**, M.D. Max von Pettenkofer-Institut für Hygiene und Mikrobiologie, Germany 1991; Wyoming Excellence Chair – Prion Biology; Professor Veterinary Science and Molecular Biology, 2009.

### Professors Emeritus

Dale Isaak, Randy Lewis, Nancy Petersen, Jordanka Zlatanova

Modern biology is based on a fundamental understanding of molecular processes. Recent advances in molecular biology have led to an explosion of knowledge about gene expression and the role gene products play in cell function. Undergraduate programs in molecular biology offer learning opportunities at the forefront of modern biology.

The molecular biology degree programs are designed to prepare students for the future by combining a foundation in basic sciences and humanities with a broad selection of courses in molecular biology, biochemistry, genetics and microbiology. Advanced undergraduates attend an outside speaker's program that includes some of the world's best-known scientists. Modern, well-equipped teaching and research laboratories contribute significantly to the educational experience of a student. All junior- and senior-level undergraduates are encouraged to participate in research projects with individual faculty members. Involvement in an active research program provides the student with an additional dimension of learning beyond what is assimilated in courses. A student learns to plan experiments, solve technical problems and experience scientific advances first hand. An undergraduate research project also promotes close interaction between the undergraduate and graduate students, postdoctoral researchers, staff and faculty.

Many molecular biology majors continue their education beyond the bachelor's level by going to graduate school or to medical, dental or veterinary school. Some students choose to use their education to gain employment in biotechnology, clinical or basic research laboratories. Other career choices include teaching, medical technology, law and business.

To obtain a B.S. degree in molecular biology, a student, with the aid of a molecular biology adviser, designs a program of study that includes courses from the Molecular Biology Core Requirements and Electives listed below. Additional course lists are provided as an aid in developing an individualized program of study in key Interest Areas such as Biochemistry, Cell and Molecular Genetics, Computational Molecular Biology, Microbiology, and Preprofessional Health Sciences studies. Courses listed under the Interest Areas are optional and the student and adviser will design a unique curriculum suited to the student's personal interests. Flexibility in course selection also permits students to fulfill the various requirements of postgraduate and professional schools. Completion of a B.S.

in Molecular Biology provides a student with the tools needed to open the door to exciting futures in science, medicine and agriculture.

We expect that our graduating students will have a strong foundation in basic science, biochemistry and molecular biology that will enable them to:

1. understand the basis of multiple molecular mechanisms central to gene expression;
2. utilize molecular and microbiological laboratory techniques in future jobs or programs and trouble-shoot experimental challenges;
3. apply for graduate programs in molecular biology, microbiology or other life sciences;
4. begin employment as a laboratory research assistant in academia or the medical or agricultural biotechnology industries;
5. utilize a background in biochemistry, cell and molecular biology to promote success in the basic science curriculum in medical or other health professional schools;
6. integrate a background in biochemistry, cell and molecular biology into career development in professions such as law, genetic counseling, or public health policy;
7. employ evidence-based scientific reasoning skills in evaluating the use of molecular genetics in the prevention, diagnosis and treatment of medical disorders.

### Requirements for Molecular Biology Majors

General Requirements	Hours
Total credits (college requirement) .....	128
3000-level or above	
(university requirement) .....	42
Fulfillment of University Studies Program (consult adviser)	
Fulfillment of molecular biology general science, core and elective requirements listed below	

MOLB Requirements	Hours
<i>General Science Requirement</i>	
LIFE 1010 .....	4
MOLB 2021 .....	4
LIFE 3050 .....	4
CHEM 1020 and 1030 .....	8
CHEM 2420 and 2440 .....	8

PHYS 1110 and 1120 .....	8
MATH 2200* .....	4
STAT 2050 .....	4
<b>Total</b>	<b>44</b>

\*The alternative math courses (MATH 1450 or 1400 and 1405) may be substituted with adviser approval.

### MOLB Core Requirement

MOLB 3000 .....	3
MOLB 4600 and 4610 and 4615 .....	9
MOLB 4320 .....	4
MOLB 4485 .....	1
MOLB 4440 or 4450 or 4670 .....	3
MOLB 4050 and 4051 or 4052 .....	2
<b>Total</b>	<b>22</b>

### MOLB Elective Requirement

Choose from the following courses to fulfill the 9-credit MOLB elective requirement; note limitations below<sup>1</sup>

MOLB 4010 .....	1-3
MOLB 4100 .....	3
MOLB 4260 .....	1
MOLB 4400 .....	4
MOLB 4440 .....	3
MOLB 4450 .....	3
MOLB 4460 .....	3
MOLB 4495 .....	3
MOLB 4510 .....	3
MOLB 4540 .....	4
MOLB 4660 .....	3
MOLB 4670 .....	3
MOLB 5650 .....	3

<sup>1</sup>Molecular Biology elective limitations: the credit hours that may be applied toward the 9-credit MOLB elective requirement are limited as follows: MOLB 4010 (max. 3 credits total). Additional hours in MOLB 4050/4051/4052 (beyond the core requirement of 2 credits) may not be applied toward the 9-credit MOLB elective requirement. Additional credits in MOLB 4010, 4050, 4051, and 4052 may be applied to general university and 3000-level or above credit requirements.

### Molecular Biology Interest Areas

After discussing individual interests with a molecular biology adviser, a student should enroll in additional courses that will enhance preparation for a chosen career objective. Listed below are recommended courses that will further develop a student's skills and understanding in five Interest Areas.

Biochemistry	Hours
CHEM 2230 .....	4
CHEM 3550 or 4507 and 4508 .....	3-6
CHEM 4230 .....	4
CHEM 4400 .....	3
CHEM 4560 .....	3
CHE 4100 .....	3
COSC 1010 or 1030 or 1100 .....	3-4
MOLB 4010 .....	6
MOLB 4460 .....	3
MOLB 5650 .....	3



<b>Cell and Molecular Genetics</b>		<b>Hours</b>
MOLB 4010	.....	6
MOLB 4260	.....	1
MOLB 4440	.....	3
MOLB 4450	.....	3
MOLB 4660	.....	3
MOLB 4670	.....	3
ZOO 4280	.....	3
ZOO 4340	.....	4
ZOO 4670	.....	4
<b>Computational Molecular Biology</b>		<b>Hours</b>
COSC 1010 or 1030 or 1100	.....	3-4
COSC 2030	.....	4
IMGT 2400	.....	3
IMGT 3400	.....	3
MOLB 4010	.....	6
MOLB 4495	.....	3
MOLB 5650	.....	3
BOT 4550	.....	4
CHEM 4560	.....	3
STAT 3050	.....	3
STAT 4255	.....	3
STAT 5380	.....	4
<b>Microbiology</b>		<b>Hours</b>
MICR 2220	.....	4
MICR 4130	.....	3
MICR 4220	.....	3
MICR 4360	.....	4
MOLB 4010	.....	6
MOLB 4400	.....	4
MOLB 4440	.....	3
MOLB 4460	.....	3
MOLB 4510	.....	3
MOLB 4540	.....	4
PATB 4710	.....	3
<b>Preprofessional Health Sciences</b>		<b>Hours</b>
MOLB 4010	.....	6
MOLB 4100	.....	3
MOLB 4400	.....	4
MOLB 4450	.....	3
MOLB 4510	.....	3
MOLB 4660	.....	3
MOLB 4670	.....	3
MICR 2220	.....	4
PATB 4710	.....	3
PHCY 4450	.....	4
PSYC 1000	.....	3
PSYC 2210 or 2340 or 3120	.....	3
SOC 1000	.....	3
ZOO 2040/2041	.....	3-4
ZOO 3115	.....	4
ZOO 4125	.....	4
ZOO 4280	.....	3
ZOO 4340	.....	4
ZOO 4670	.....	4

### Recommended Course Sequence

The following course sequence is recommended for MOLB majors. In consultation with a student's advisor, electives should be selected to fulfill University Studies requirements and to enhance a student's educational background.

Note that this example course sequence does not include specified credits for undergraduate research, summer courses, or study abroad experiences. Many students opt to complete their undergraduate courses in five years in order to take full advantage of the educational and undergraduate research opportunities in the Department of Molecular Biology.

#### FRESHMAN YEAR: Fall Hrs.

LIFE 1010	.....	4
CHEM 1020	.....	4
FYS	.....	3
MATH 2200 or STAT 2050	.....	4

#### FRESHMAN YEAR: Spring Hrs.

MOLB 2021	.....	4
CHEM 1030	.....	4
COM1	.....	3
STAT 2050 or MATH 2200	.....	4

#### SOPHOMORE YEAR: Fall Hrs.

MOLB 3000	.....	3
CHEM 2420	.....	4
COM2	.....	3

#### SOPHOMORE YEAR: Spring Hrs.

MOLB 4600	.....	3
CHEM 2440	.....	4

#### JUNIOR YEAR: Fall Hrs.

MOLB 4610	.....	3
PHYS 1110	.....	4
MOLB 4485	.....	1
LIFE 3050	.....	4

#### JUNIOR YEAR: Spring Hrs.

MOLB 4615	.....	3
PHYS 1120	.....	4
MOLB 4320	.....	4
MOLB 4XXX	.....	3

#### SENIOR YEAR: Fall Hrs.

MOLB 4XXX	.....	3-7
MOLB 4050	.....	1

#### SENIOR YEAR: Spring Hrs.

MOLB 4XXX	.....	3
MOLB 4051	.....	1

### Requirements for Undergraduate Minor in Molecular Biology

Students wishing to minor in molecular biology should discuss their plans with an adviser in the Department of Molecular Biology. Formal declaration of molecular biology as a minor requires 1) submission of a form

that must be approved by the Department of Molecular Biology and the College of Agriculture and Natural Resources Dean's Office, 2) appointment of a minor adviser from the Department of Molecular Biology.

To receive a minor in molecular biology, a student must complete courses listed in the following areas:

#### Science Foundation course requirements

	<b>Hrs.</b>	
LIFE 1010	.....	4
LIFE 3050	.....	4
CHEM 1020 and 1030	.....	8
CHEM 2300 or 2420 and 2440	.....	4-8
MATH 2200 or 1450 or 1400 and 1405	.....	4-6

#### MOLB course requirements Hrs.

MOLB 2021	.....	4
MOLB 3000	.....	3
Lab course MOLB 4320 or 4010	.....	3-4
MOLB 3610 and 5 additional MOLB credits or MOLB 4600 and 4610 and 3 additional MOLB credits (excluding MOLB 4010, 4050, 4051, 4052 and 4850). MOLB 4615 is recommended	.....	9

### Graduate Study

The Department of Molecular Biology offers the Ph.D., M.S. and M.A. degrees for students who wish to do graduate work in molecular biology, in preparation for careers in academia, the biotechnology industry, medicine, or other professions. Prospective graduate students should visit the Molecular Biology Departmental web site ([www.uwyo.edu/molecbio/](http://www.uwyo.edu/molecbio/)) or the Graduate Program in Molecular and Cellular Life Sciences web site ([www.uwyo.edu/mcls/](http://www.uwyo.edu/mcls/)) for more information.

#### Program Specific Admission Requirements

A prospective student must apply to a Molecular Biology Department faculty member with whom they wish to work ([www.uwyo.edu/molecbio/faculty-and-staff/](http://www.uwyo.edu/molecbio/faculty-and-staff/)). Once a mentor has been identified, the student should apply to the graduate program of choice.

Candidates for all molecular biology graduate programs must have attained minimum entrance requirements, as specified by:

(1) Department of Molecular Biology graduate admission requirements, posted at [www.uwyo.edu/molecbio/](http://www.uwyo.edu/molecbio/), and

(2) University of Wyoming Graduate Student Regulations and policies, posted on the Office of the Registrar website: [www.uwyo.edu/registrar/university\\_catalog/grad\\_students.html](http://www.uwyo.edu/registrar/university_catalog/grad_students.html)

Instructions for applying to the Molecular Biology Graduate Degree Programs are posted at [www.uwo.edu/molecbio/degree-programs/index.html](http://www.uwo.edu/molecbio/degree-programs/index.html).

### Program Specific Degree Requirements

Throughout the degree program, a graduate student is guided and evaluated by the research adviser and graduate committee. Here we provide only general descriptions of degree programs. Details of coursework and other requirements for obtaining a Ph.D., M.S. or M.A. degree in Molecular Biology are specified in the Departmental Policies for the Graduate Programs, listed by date of program entrance on the departmental website ([www.uwo.edu/molecbio/](http://www.uwo.edu/molecbio/)).

#### *Doctor of Philosophy in Molecular Biology (Ph.D.)*

The Ph.D. is a research-intensive degree. The student conducts a guided research project in the laboratory into which they have been accepted. The faculty research adviser is responsible for financial support of the student. A student will conduct a research project that is expected to result in multiple publications in research journals as well as presentations in the department and at scientific meetings. Student performance is monitored by a dissertation committee that will evaluate a student's research proposal, preliminary examination, seminar presentations, written dissertation, final public seminar, and final oral defense of the dissertation. In consultation with the faculty research adviser, a student may elect to be a teaching assistant. Students pursuing the Ph.D. degree in Molecular Biology usually complete their program in about five years.

#### *Master of Science in Molecular Biology (M.S.)*

An M.S. degree student will conduct a research project that is expected to result in publication in research journals as well as presentations in the department and at scientific meetings. Student performance is monitored by a thesis committee that will evaluate a student's research proposal, seminar presentations, written thesis, final public seminar, and final oral defense of the thesis. In consultation with the faculty research adviser, a student may elect to be a teaching assistant. A student should not have expectations of financial support, however funding may be negotiated on an individual basis and is at the discretion of the faculty research adviser. Students pursuing the M.S. degree in Molecular Biology usually complete their program in about two years.

Undergraduate students interested in a combined bachelor of science and master of science (B.S./M.S.) program should contact the Molecular Biology Graduate Program Chairperson.

#### *Master of Arts in Molecular Biology (M.A.)*

Students interested in graduate study but who intend to apply for a post-graduate professional program such as medical or law school, should consider an M.A. program of study. An M.A. degree candidate will negotiate with their faculty adviser to formulate an appropriate research project. Student performance is monitored by a thesis committee that will evaluate a student's written thesis, final public seminar, and final oral defense of the thesis. A student pursuing an M.A. degree should not have expectations of financial support. Students pursuing the M.A. degree in Molecular Biology usually complete their program in two academic semesters plus two summers.

## Molecular Biology (MOLB)

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).**

**1101. First-Year Seminar. 3. [(none)▶FYS] 2021 [2210]. General Microbiology. 4.** Introduces nature and diversity of microorganisms and their implication for all of biology. Covers comparative properties of eukaryotic and prokaryotic microbes, as well as their roles as disease agents, ecological agents, and model systems for understanding of fundamental biological processes at the molecular level. Cross listed with MICR 2021. *Prerequisites:* A grade of C or better in LIFE 1010 and CHEM 1000 or 1020.

**2240. Medical Microbiology. 4.** Designed primarily for nursing and pre-pharmacy majors. Introduces microbiology, including the diversity of prokaryotic and eukaryotic microbes, their structural and physiological properties, and their applied medical significance. Covers the basic principles of the immune system and emphasizes the communicable diseases of man caused by microbial pathogens. Normally offered spring semester. Cross listed with MICR 2240. *Prerequisites:* LIFE 1010.

**3000. Introduction to Molecular Biology. 3.** An introduction to molecular biological processes governing cellular events is presented in the context of the structure of genomes, genes and chromosomes, DNA replication, gene expression, signal transduction pathways and the regulation of cellular processes in disease and development. Experimental methods and technologies will also be discussed. Normally

offered fall and summer semesters. *Prerequisites:* LIFE 1010 and CHEM 1030; MOLB/MICR 2021 recommended.

**3610. Principles of Biochemistry. 4.** One-semester biochemistry course for life-, health- and physical-science students. Introduces a full range of biochemical concepts including discussion of major macromolecules, metabolism, and molecular biology. Credit cannot be earned in MOLB 3610 and MOLB 4600 or MOLB 4610. *Prerequisites:* LIFE 1010 and a grade of C or better in CHEM 2300 or 2420. (Normally offered fall and summer semesters)

**4010. Laboratory Research in Molecular Biology. 1-3 (Max. 12).** Undergraduate student will conduct a laboratory or computational research project under the guidance of a Molecular Biology Department faculty member, who will serve as the student's research adviser. *Prerequisites:* LIFE 1010 or concurrent enrollment, and consent of instructor.

**4050. Student Seminar. 1 (Max. 4).** Exposes students to current topics in molecular biosciences and examines primary journal literature with oral presentations and class discussions. Offered Satisfactory/Unsatisfactory only. *Prerequisites:* MOLB 3000 and 3610 or 4600. (Normally offered fall and spring semesters)

**4051 [4050]. Departmental Seminar. 1 (Max. 15).** Attend a series of weekly seminars on a diverse set of research topics presented by visiting faculty or research scientists and will participate in a discussion following the seminar. Satisfactory/Unsatisfactory only. Dual listed with MOLB 5051. *Prerequisite:* MOLB 3000 or 3610 or 4600. (Normally offered fall and spring semesters).

**4052. [4050]. Summer Seminar. 1 (Max. 5).** Consists of one week of lectures, presented by a renowned scientist from either academics or industry. The material presented is taken from the research program of the speaker. Offered Satisfactory/Unsatisfactory only. Dual listed with MOLB 5052.

**4100 [3980]. Clinical Biochemistry. 3.** An integrated discussion of biochemical, molecular, and physiological principles underlying human medical disorders and the biochemical and molecular genetic tests used in prevention, diagnosis and treatment. *Prerequisite:* MOLB 3610 or 4600. (Normally offered spring semester)

**4260. Quantitative Microscopy. 1.** Acquaints students with principles of light microscopy, use of fluorescent probes and image processing software. Students use phase contrast, fluorescent, and confocal microscopes learning to measure and compare size and intensity of images. Dual listed with MOLB 5260. *Prerequisites:* MOLB 4600 or LIFE 3600, and PHYS 1120.

**4310. Foundations of Scholarship and Discovery. 1 (Max. 3).** An interdisciplinary discussion based exploration of the nature and creation of knowledge, principles underpinning creativity, inquiry, skepticism, critical analysis, the insecurity of discovery on the frontiers of knowledge, and ethical decision-making. Examines the path from novice to expert thinker and creativity at discipline boundaries. Cross listed with HLSC 4310. *Prerequisites:* completion of USP WB requirement and junior standing.

**4320. Investigations in Molecular Biology. 4. [(none)◀COM3]** Research project of the type experienced by graduate students or research associates in academic or commercial settings. Student performance, engagement and understanding will be assessed through written assignments (literature reviews, lab reports), digital communication (electronic research notebook, data presentation) and oral communications (literature presentation, research effort report). *Prerequisite:* grade of C or better in MOLB 3610 or MOLB 4610.

**4400. Immunology. 4.** Biology of immune system; cellular and molecular mechanisms; host resistance to infectious agents; as well as hypersensitivities, autoimmunity, tumor and tissue rejection. Includes laboratory for immunological techniques. Cross listed with PATB 4400. Dual listed with MOLB 5400. *Prerequisite:* PATB 2220. (Normally offered fall semester)

**4440. Microbial Genetics. 3.** Discusses microbial genetic approaches to study cell function and provides a molecular foundation for understanding how genes work to elicit phenotypes. Dual listed with MOLB 5440; Cross-listed with MICR 4440. *Prerequisites:* MOLB 2021 and 3000 and LIFE 3050. (Normally offered spring semester)

**4450. Cell and Developmental Genetics. 3.** Integrates the genetic control of cell regulation and animal development in both vertebrate and invertebrate model systems such as *Drosophila*, *C. elegans* and the mouse. Includes studies of eukaryotic signal transduction, gene control, and current transgenic technologies. Dual listed with MOLB 5450. *Prerequisites:* MOLB 3000 and 4610, or consent of instructor.

**4460. Microbial Physiology and Metabolism. 3.** Studies life processes of microbes as mediated by their structures acting in consort, in response to changing environments. Cross-listed with MICR 4460. Dual listed with MOLB 5460. *Prerequisites:* MOLB 2021 or MOLB 2240 or MICR 2021 or MICR 2240, and MOLB 3610 or MOLB 4610. (Normally offered fall semester)

**4485. Computers in Biology. 1.** Prepares students to use existing internet resources as research tools in biology without the need to write or install software. Topics include literature searching, multiple sequence alignment and phylogenetic tree construction, primer design, protein homology modeling, and the use of model organism databases. Dual listed with MOLB 5485. *Prerequisites:* MOLB 3000, 3610 or 4610, or LIFE 3600.

**4495. Bioinformatics. 3.** Course topics range from classic algorithms in bioinformatics like multiple sequence alignment and phylogenetic tree construction to problems of functional analysis, including computational genomics, gene expression, protein structure, and systems biology analyses. Dual listed with MOLB 5495. *Prerequisite:* MOLB 3000 or 3610 or 4610 (MOLB 3610 or 4610 may be taken concurrently with MOLB 4495).

**4510. Introductory Virology. 3.** Prokaryotic and eukaryotic viruses as infectious agents and models for modern molecular biology. Examines concepts and principles of pathogenesis, host response and the regulation of virus-host interactions. Genome organization, structure and replication will be examined within the context of the co-evolution of virus and host. Cross listed with MICR 4510. Dual listed with MOLB 5510. *Prerequisites:* MOLB 3610 or 4600 plus 4610.

**4520. Public Health Issues in Developing Countries. 2. [G◀(none)]** Fundamental principles and practices of public health systems in developing countries will be presented including epidemiology, etiology, integrated management, will be presented within the context of globalization, climate change, and socio-economic, political and cultural constraints. Principles will be illustrated by case studies of major health issues in an interdisciplinary, holistic manner. Cross listed with HLSC 4520. *Prerequisite:* LIFE 1010, upper division or graduate standing and consent of instructor.

**4530. Global Experience in Public Health. 2.** A three week inter-semester service learning experience in a developing country. Students will participate, in collaboration with in-country healthcare professionals, in a defined public health education and research program designed to address major public health challenges. Students will gain a global perspective within the cultural context of the developing nation. Cross listed with HLSC 4530. *Prerequisites:* HLSC/MOLB 4520 and consent of instructor.

**4540. Microbial Diversity and Ecology. 4.** Introduces the diversity and ecology of soil microbes through an integrated lecture and

laboratory course. Emphasis on molecular approaches to analyzing microbial diversity and evolution, and student-directed experimental design. Provides a continuum of realistic research experiences in molecular microbial ecology, from field work to evolutionary analysis of DNA sequence data. Cross listed with MICR 4540, ECOL 5540; Dual listed with MOLB 5540. *Prerequisite:* MOLB 2021.

**4600. Biochemistry 1: Biomolecules. 3.** Discussion of the structure and function of major biomolecules, including proteins, carbohydrates, nucleic acids and lipids, will provide the foundation for understanding biochemical, molecular and cellular processes. Dual listed with MOLB 5600. *Prerequisites:* Grade of C or better in both MOLB 3000 and CHEM 2420 or 2300. (Normally offered spring semester)

**4610. Biochemistry 2: Bioenergetics & Metabolism. 3.** Energy transduction and the central biochemical processes are discussed with an emphasis on regulatory controls and integration in metabolism. Dual listed with MOLB 5610. *Prerequisite:* Grade of C or better in MOLB 4600 or consent of instructor. (Normally offered fall semester)

**4615. Biochemistry 3: Molecular Mechanisms. 3.** Biochemical and molecular mechanisms underlying cell function, including gene expression and epigenetic regulation, RNA and protein modification and function, assembly of macromolecular complexes, signaling and regulation of the cell cycle, are discussed. Dual listed with MOLB 5615. *Prerequisites:* Grade of C or better in MOLB 4610 or consent of instructor. (Normally offered spring semester)

**4660. Flow and Maintenance of Molecular Genetic Information. 3.** Introduction to current research in the flow and maintenance of genetic information, including discussions of transcription, translation and DNA replication, recombination and repair. New advances in understanding DNA and protein structure and function, genome organization, and gene expression are explored as well as principles of contemporary experimental methods. Dual listed with MOLB 5660. *Prerequisites:* MOLB 3000 and 3610 or 4610.

**4670. Advanced Molecular Cell Biology. 3.** Key concepts in eukaryotic cell biology will be presented with a focus on cellular processes that form the basis for human diseases. Cellular organization, dynamics, and signaling will be emphasized. Students will also explore principles of research design by critical reading and discussion of scientific literature. Dual listed with MOLB 5670. *Prerequisites:* MOLB 3000 or 3610 or 4610.

**4850. Undergraduate Teaching Internship.**

**1 (Max. 4).** Undergraduate student will assist in classroom or laboratory teaching under the guidance of an instructor in Molecular Biology. Offered Satisfactory/Unsatisfactory only. *Prerequisites:* junior standing and consent of instructor.

**4990 Topics In:\_\_\_ 1-3 (Max. 6).** Lectures, literature reviews and discussion of selected current topics in different areas of molecular biology. Please check class schedule for current offerings each semester. *Prerequisites:* MOLB 3000 or 3610 or 4600.

**5010. Advanced Laboratory Research in Molecular Biology. 1-3 (Max. 18).** Students in PhD, MS and MA programs in Molecular Biology and doctoral students in the Molecular and Cellular Life Sciences (MCLS) graduate program, work in laboratory or computational research projects under the guidance of a Molecular Biology faculty member. *Prerequisites:* graduate standing and consent of instructor.

**5050. Advanced Student Seminar. 2 (Max. 8).** Introduction of reading, analyzing, and discussing primary sources in scientific literature. Read primary research papers, give presentations with full participation in critical discussions of data and interpretations of all journal articles analyzed. Papers chosen for review are typically related to research of Molecular Biology Departmental Seminar Series speakers. Offered Satisfactory/Unsatisfactory only. *Prerequisites:* MOLB 3000 and 3610 or 4600. (Normally offered fall and spring semesters)

**5051. Department Seminar. 1 (Max. 15).** Required attendance at a series of weekly seminars presented by visiting faculty on a diverse set of research topics. Undergraduates are able to use one credit hour to partially fulfill the seminar requirement. S/U only. Dual listed with MOLB 4051. *Prerequisite:* MOLB 3000 or 3610 or 4600. (Normally offered fall and spring semesters).

**5052. Summer Seminar. 1 (Max. 5).** Consists of one week of lectures, presented by a renowned scientist from either academics or industry. The material presented is taken from the research program of the speaker. S/U Only. Dual listed with MOLB 4052.

**5260. Quantitative Microscopy. 1.** Acquaints students with principles of light microscopy, use of fluorescent probes and image processing software. Students use phase contrast, fluorescent, and confocal microscopes learning to measure and compare size and intensity of images. Dual listed with MOLB 4260. *Prerequisite:* MOLB 4600 or LIFE 3600, and PHYS 1120.

**5400. Immunology. 4.** Biology of immune system; cellular and molecular mechanisms; host resistance to infectious agents; as well as

hypersensitivities, autoimmunity, tumor and tissue rejection. Includes laboratory for immunological techniques. Cross listed with PATB 4400. Dual listed with MOLB 4400. *Prerequisite:* PATB 2220. (Normally offered fall semester)

**5440. Microbial Genetics. 3.** Discusses microbial genetic approaches to study cell function and provides a molecular foundation for understanding how genes work to elicit phenotypes. Dual listed with MOLB 4440; Cross-listed with MICR 4440. *Prerequisites:* MOLB 2021 and 3000 and LIFE 3050. (Normally offered spring semester)

**5450. Cell and Developmental Genetics. 3.** Integrates the genetic control of cell regulation and animal development in both vertebrate and invertebrate model systems such as *Drosophila*, *C. elegans* and the mouse. Includes studies of eukaryotic signal transduction, gene control, and current transgenic technologies. Dual listed with MOLB 4450. *Prerequisite:* MOLB 3000 and 4610, or consent of instructor.

**5460. Microbial Physiology and Metabolism I. 3.** Studies life processes of microbes as mediated by their structures acting in consort, in response to changing environments. Dual listed with MOLB 4460. *Prerequisites:* MOLB 2021 or MOLB 2240 or MICR 2021 or MICR 2240, and MOLB 3610 or MOLB 4610. (Normally offered fall semester.)

**5485. Computers in Biology. 1.** Prepares students to use existing internet resources as research tools in biology without the need to write or install software. Topics include literature searching, multiple sequence alignment and phylogenetic tree construction, primer design, protein homology modeling, and the use of model organism databases. Dual listed with MOLB 4485. *Prerequisites:* MOLB 3000, 3610 or 4610, or LIFE 3600.

**5495. Bioinformatics. 3.** Topics range from classic algorithms in bioinformatics like multiple sequence alignment and phylogenetic tree construction to problems of functional analysis, including computational genomics, gene expression, protein structure, and systems biology analyses. Dual listed with MOLB 4495. *Prerequisite:* MOLB 3000 or 3610 or 4610 (MOLB 3610 or 4610 could be taken concurrently with MOLB 5495). Graduate standing.

**5510. Introduction to Virology. 3.** Prokaryotic and eukaryotic viruses as infectious agents and models for modern molecular biology. Examines concepts and principles of pathogenesis, host response and the regulation of virus-host interactions. Genome organization, structure and replication will be examined

within the context of the co-evolution of virus and host. Dual listed with MOLB 4510.

*Prerequisites:* MOLB 3610 or 4600 and 4610.

**5520. Molecular and Cellular Life Sciences Laboratory Rotations. 3 (Max. 6).** Laboratory research rotations for first year Molecular and Cellular Life Sciences (MCLS) students in the doctoral program. *Prerequisite:* Enrollment in the Molecular and Cellular Life Sciences (MCLS) program.

**5521. Molecular and Cellular Life Sciences Cornerstone. 1.** Introduction for students in the Molecular and Cellular Life Sciences program to graduate school and research. Exposes students to diverse faculty research programs and elements fundamental to successful graduate and scientific careers, including scientific publishing, grants, careers, intellectual property, and ethical expectations. Offered Satisfactory/Unsatisfactory only. *Prerequisite:* Enrollment in the Molecular and Cellular Life Sciences doctoral program. (Normally offered fall semester)

**5540. Microbial Diversity and Ecology. 4.** Introduces the diversity and ecology of soil microbes through an integrated lecture and laboratory course. Emphasis on molecular approaches to analyzing microbial diversity and evolution, and student-directed experimental design. Provides a continuum of realistic research experiences in molecular microbial ecology, from field work to evolutionary analysis of DNA sequence data. Cross listed with ECOL 5540; Dual listed with MOLB 4540. *Prerequisite:* MOLB 2021.

**5600. Biochemistry 1: Biomolecules. 3.** Discussion of the structure and function of major biomolecules, including proteins, carbohydrates, nucleic acids and lipids, will provide the foundation for understanding biochemical, molecular and cellular processes. Dual listed with MOLB 4600. *Prerequisites:* consent of instructor. (Normally offered spring semester)

**5610. Biochemistry 2: Bioenergetics & Metabolism. 3.** Energy transduction and the central biochemical processes are discussed with an emphasis on regulatory controls and integration in metabolism. Dual listed with MOLB 4610. *Prerequisite:* consent of instructor. (Normally offered fall semester)

**5615. Biochemistry 3: Molecular Mechanisms. 3.** Biochemical and molecular mechanisms underlying cell function, including gene expression and epigenetic regulation, RNA and protein modification and function, assembly of macromolecular complexes, signaling and regulation of the cell cycle, are discussed. Dual listed with MOLB 4615. *Prerequisites:* consent of instructor. (Normally offered spring semester)

**5630. Advanced Topics in Molecular Biology. 1-3 (Max. 6).** Lectures, literature reviews and discussion of selected current topics in molecular biology. Check class schedule for current offerings each semester. *Prerequisites:* MOLB 3000 or 3610 or 4600.

**5650. Protein Structure and Function. 3.** Designed to provide an in-depth look at proteins and their structure. Topics will include protein purification, structure analysis, folding, modification, interactions with other molecules, enzyme mechanism, and other current topics. *Prerequisite:* MOLB 4610.

**5660. Flow and Maintenance of Molecular Genetic Information. 3.** Introduction to current research in the flow and maintenance of genetic information, including discussions of transcription, translation and DNA replication, recombination and repair. New advances in understanding DNA and protein structure and function, genome organization, and gene expression are explored as well as principles of contemporary experimental methods. Dual listed with MOLB 4660. *Prerequisites:* MOLB 3000 and 3610 or 4610.

**5670. Advanced Molecular Cell Biology. 3.** Key concepts in eukaryotic cell biology will be presented with a focus on cellular processes that form the basis for human diseases. Cellular organization, dynamics, and signaling will be emphasized. Students will also explore principles of research design by critical reading and discussion of scientific literature. Dual listed with MOLB 4670. *Prerequisites:* MOLB 3000 or 3610 or 4610.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisites:* graduate standing and consent of instructor.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1 - 12. (Max 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Designed for students who are involved in research for their dissertation project. Also

used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate degree program.

**5990. Internship. 1 - 12 (Max. 24).** *Prerequisite:* graduate standing.

## Department of Plant Sciences

50 Agriculture Building, (307) 766-3103  
FAX: (307) 766-5549

Web site: [www.uwyo.edu/plantsciences](http://www.uwyo.edu/plantsciences)  
Department Head: Jim J. Heitholt

### Professor:

**JIM HEITHOLT**, B.S. Western Illinois University 1978; M.S. University of Missouri 1980; Ph.D. University of Kentucky 1984; Professor of Crop Physiology 2014.

### Associate Professors:

**STEPHEN K. HERBERT**, B.S. Seattle Pacific University 1980; M.S. University of Washington 1984; Ph.D. 1988; Associate Professor of Plant Physiology and Biochemistry 1999.

**M. ANOWARUL ISLAM**, B.S. Bangladesh Agricultural University 1990; M.S. Institute of Postgraduate Studies in Agriculture, Bangladesh 1996; Ph.D. University of Sydney, Australia 2003; Associate Professor of Forage Agronomy 2015, 2008.

**ANDREW R. KNISS**, B.S. University of Wyoming 2001; M.S. University of Nebraska-Lincoln 2003; Ph.D. University of Wyoming 2006; Associate Professor of Weed Ecology and Management in Cropping Systems 2013, 2007.

**BRIAN A. MEALOR**, B.S. North Georgia College and State University 1999; M.S. University of Wyoming 2003; Ph.D. 2006; Associate Professor of Invasive Plant Ecology and Management in Rangeland 2015, 2009.

**URSZULA NORTON**, B.S. Warsaw Agricultural University 1998; M.S. 1990; M.S. Iowa State University 1995; Ph.D. University of Montana 2000; Associate Professor of Agroecology and Soil Science 2015, 2009.

### Assistant Professors:

**SADANAND DHEKNEY**, B.S. Mahatma Phule Agricultural University India 1997; M.S. Tamil Nadu Agricultural University India 1999; Ph.D. University of Florida 2004; Assistant Professor of Horticulture 2012.

**RANDA JABBOUR**, B.S. Rochester Institute of Technology 2003; Ph.D. Pennsylvania State University 2009; Assistant Professor of Agroecology 2013.

**GUSTAVO SBATELLA**, B.S. Universidad Nacional de Buenos Aires, Argentina 1990; M.S. University of Wyoming 2004; Ph.D. 2006; Assistant Professor of Irrigated Crops and Weed Management 2014.

**WILLIAM STUMP**, B.S. Purdue University 1981; M.S. Colorado State University 1984; B.F.A. 1991; Ph.D. 1997; Assistant Professor of Plant Pathology 2014.

### Academic Professionals:

**CHRIS HILGERT**, B.S. Oregon State University 2001; M.S. 2003; Extension Horticulture Specialist, Master Gardener Coordinator 2011.

**KAREN PANTER**, B.S. Colorado State University 1979; M.S. University of Nebraska 1981; Ph.D. Colorado State University 1985; Extension Horticulture Specialist 1998; Senior Extension Educator 2012.

### Adjunct Professors:

Axel Garcia y Garcia, Abdel Mesbah, Augustine Obour

### Emeritus Faculty:

Rollin H. Abernethy, Ron Delaney, Mark Ferrell, Alan Gray, Robin W. Grosse, David Koch, James M. Krall, Stephen D. Miller, Thomas D. Whitson, David Wilson

The Department of Plant Sciences offers a Bachelor of Science degree in Agroecology jointly with the Ecosystem Science and Management Resources, and three minors. Minors offered by Plant Sciences include Agroecology, Horticulture, and Plant Protection. The minor in horticulture includes courses in landscape design, plant materials and their propagation, organic food production, turfgrass science, and greenhouse design and management. The minor in Plant Protection includes courses in agronomy, plant genetics, plant pathology, and weed science. These minors allow students within many bachelors programs to obtain an added emphasis in areas that enjoy strong employment opportunities.

## Agroecology Program

Rooms 50/2013 Agriculture Building  
Phone: (307) 766-3103/766-2263

## Departments of Plant Sciences and Ecosystem Science and Management

The Bachelor of Science degree program in agroecology is an interdepartmental major involving faculty in the Departments of Plant Sciences and Ecosystem Science and Management. An agroecology minor is also available.

The goal of Agroecology is to promote the adoption of more sustainable agricultural practices in the United States and abroad. The program is intended to provide students with the following knowledge and skills.

- Writing, oral communication, and math skills sufficient for success as an agricultural professional or for admission to graduate study to a related graduate degree program.
- Sufficient knowledge of physics, chemistry, geology, cell biology, physiology, genetics, evolution, and ecology for participation in modern agriculture.
- Practical knowledge and skills that include using computer technology for writing and analyzing data, using geographical information systems, conducting chemical and biological analyses of soil and water, diagnosing plant health problems, identifying plants and insects, and the general practice of horticulture and agronomy.

#### Professors:

Jim J. Heitholt, Plant Sciences  
Ann L. Hild, ESM  
David E. Legg, ESM  
Larry C. Munn, ESM  
K.J. Reddy, ESM  
Scott R. Shaw, ESM  
Michael A. Smith, ESM  
Peter D. Stahl, ESM  
Thomas L. Thurow, ESM  
Dave Williams, ESM  
Stephen E. Williams, ESM

#### Associate Professors:

Timothy Collier, ESM  
Stephen K. Herbert, Plant Sciences  
Anowarul Islam, Plant Sciences  
Andrew R. Kniss, Plant Sciences  
Brian A. Mealor, Plant Sciences  
Scott Miller, ESM  
Urszula Norton, Plant Sciences  
Daniel J. Rodgers, ESM  
James W. Waggoner, ESM

#### Assistant Professors:

Sadanand Dhekney, Plant Sciences  
Randa Jabbour, Plant Sciences  
Gustavo Sbatella, Plant Sciences  
William Stump, Plant Sciences

#### Academic Professionals:

Christ Hilgert, Plant Sciences  
Karen Panter, Plant Sciences

### Agroecology Major

A B.S. degree in agroecology prepares students for careers in agriculture, natural resources, environmental and life sciences and for advanced graduate studies in specific subdisciplines within these areas. It is a broad, interdisciplinary, undergraduate curriculum that combines and integrates courses in the crop, horticulture, disease, soil, and insect sciences and is supported by a science-based curriculum and general education. Flexibility is built into the agroecology curriculum to readily accommodate students seeking to pursue an emphasis or obtain a minor in a specific discipline, to that end the breadth of the curriculum is balanced with greater depth in biology, chemistry, crop science, entomology, environmental studies, natural resource management, soil science, plant pathology, weed science, horticulture, turf management, pre-veterinary medicine, rangeland ecology and watershed management, animal science, microbiology, and molecular biology. A liberal number of electives permits design of a program that best meets individual career and educational objectives. The agroecology program is well suited for students who possess a strong interest in and an aptitude for science and interest in agriculture, the environment, life sciences, or natural resources.

The agroecology core curriculum is comprised of freshman through senior level courses that illustrate dynamic and complex interactions of plants, soils, and plant pests (diseases, insects, weeds) with the environment. Academic training is enhanced with experiential learning through research apprenticeships, internships, field studies, and special agroecology capstone courses. Special emphasis is given to development of critical thinking and communication skills, problem solving and application of science. It is an interdisciplinary program designed to prepare students for “real world” situations.

Agroecology B.S. degree recipients are prepared for careers with private and public institutions and agencies in such areas as: agricultural consulting, production or sales, research, product development, education, extension education, international programs, and scientific and technological support. These careers include but are not limited to: soil scientist, conservationist, entomologist, consultant, plant scientist, integrated pest management specialist, ecologist, research associate or technician, agronomist, biotechnician, and agroecologist. Degree recipients are also prepared for graduate education in biological and environmental sciences.

Course Requirements for Agroecology Majors	Hrs.
Agroecology .....	26
AECL 1000, 3030, 4990, SOIL 2010, 4140, and 4 hrs from a combination of AECL 4920, 4930 or 4960	
Supporting Science Biology/Genetics ...21-22	
ENTO 1000 or 1001 or REWM 3020 or ANSC 1010, and AGECE 1010 or 1020 and LIFE 1010, 2023, 3400, and CHEM 1000, 2300	
Math/Statistics .....	7
MATH 1400, STAT 2050	
Communications .....	3
COJO 2010	
Agriculture Science Electives.....	9
Select 9 hours upper division from one of the following: animal science, botany, crop science/horticulture/plant pathology (PLNT), entomology, microbiology/molecular biology, pest science, rangeland ecology and watershed management, or soil science.	
Supporting Electives.....	9
Select 9 hours upper division from any of the following: agroecology, agricultural economics, animal science, biology, botany, chemistry, communications, crop science/horticulture, environment and natural resources, entomology, food science, geography and recreation, microbiology, molecular biology, rangeland ecology and watershed management, pathobiology, plant pathology, soil science or zoology.	
Additional University Studies.....	14-23
Electives (minimum).....	31
<b>Total</b>	<b>120</b>

### Agroecology/Environment and Natural Resources Program

#### (ENR, Plant Sciences, and Ecosystem Science and Management)

Students with an especially strong interest in the environment and natural resources may choose to pursue the B.S. in agroecology/ENR. This degree is offered in conjunction with the School of Environment and Natural Resources. See the ENR Information and Advising Guide for details.

#### Agroecology Minor

#### (Plant Sciences & Ecosystem Science and Management)

Minimum requirements..... 20-21  
AECL 1000; two of the following: SOIL 2010, LIFE 2023, AECL 3030, and 9 additional upper division hours from the following: ENTO, PLNT, and/or SOIL

**Plant Protection Minor****(Plant Sciences)**

Minimum requirements.....17  
 AECL 1000, AECL 3030, and 10  
 additional hours from the following:  
 PLNT 3220, 4000, 4070, and 4120.

**Horticultural Minor****(Plant Sciences)**

Minimum requirements.....16  
 PLNT 2025 and 2026, and 12 additional  
 hours from the following: PLNT 3000,  
 3300, 3400, 4120, 4140, 4160, 4180,  
 4190, 4200, 4975.

**Graduate Study**

The Department of Plant Sciences offers curricula leading to the master of science and doctor of philosophy degrees in Agronomy. Courses within the department are offered in crop science, horticulture, plant pathology, weed science, and agronomy. Interdisciplinary coursework and research projects are common for agronomy graduate students.

**Program Specific Admission Requirements**

In addition to university minimum requirements, a majority of the department faculty and department must approve the admission. A faculty member must agree to advise the student.

**Program Specific Graduate Assistantship Information**

M.S. assistantships include an \$11,349.00 stipend, plus tuition and fee waiver, and health insurance. Ph.D. assistantships include a \$15,795.00 stipend, plus tuition and fee waiver, and health benefits. These assistantships are for the 9 month academic year, but summer support is typically available.

**Program Specific Degree Requirements****Master of Science in Agronomy****Plan A (thesis)**

Requirements for the master of science degree include 26 hours of coursework numbered 4000 or above, 4 hours of thesis research, a research proposal, original research, and oral defense of the thesis.

The M.S. degree is typically completed in two years. The student's coursework is selected to fit the student's individual needs by mutual consultation among the student, his/her major professor and graduate committee.

**Doctoral Program**

The requirements for the doctor of philosophy degree include 60 hours of coursework numbered 4000 or above, 12 hours of dissertation research, a research proposal, original research, written and oral preliminary exams to be taken when most or all coursework is completed, and an oral defense of the dissertation.

Dissertations may be in a modified journal article format but must meet university formatting requirements.

The Ph.D. degree is typically completed in four years. The student's coursework is selected to fit the student's individual needs by mutual consultation among the student, his/her major professor and graduate committee.

The department does not require language certification.

The student is expected to participate in the usual activities of scientific research such as attending and presenting at research seminars and professional meetings and publishing his/her research.

**Agroecology (AECL)**

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

**1000 [CROP/BOT 2000]. Agroecology. 4. [SB,G◀▶PN]** Introduces ecological interactions that affect food producing (agricultural) systems. Lectures and laboratory exercises study the various biological components and the science of sustainable agricultural production. Features differences between developed and developing countries. Explores crises and challenges facing agriculture and global society.

**2010. Introduction to Soil Science. 3. [SE◀▶(none)]** Introduces soil ecological processes and management in terrestrial environments. Discusses interaction of soil, biological, chemical, morphological, and physical properties with land management in wildland and agricultural ecosystems. Emphasis of the course is on plant response to soil conditions. Cross listed with SOIL 2010. Prerequisite: 4 hours of chemistry.

**3030 [2030]. Ecological Web: Ecology of Plant Protection. 3.** Introduces students to concurrent evolution of crop cultivation and organisms, both plant and animal, that attack them. Provides basic skills necessary to understand ecology and management of economic crop pests. *Prerequisites:* LIFE 1010 and AECL 1000. (Offered fall semester)

**4130. Applied Remote Sensing for Agricultural Management. 3.** Address principles and applications of remote sensing to crop and rangeland management. Provides an overview of remote sensing concepts and applications pertaining to crops, shrubs and range vegetation. In laboratory, students will learn to process remotely sensed data for mapping and monitoring crop and rangelands. Cross listed with RNEW/BOT 4130. *Prerequisites:* QA course and 9 credit hours in student's major field and junior/senior standing.

**4400. Invasive Plant Ecology. 3.** Ecological Impacts of invasive, non-indigenous plant species, the ecological, genetic and evolutionary hypotheses for invasiveness, as well as management strategies for invasive plant species. Dual listed with AECL 5400; cross listed with RNEW 4400. *Prerequisite:* LIFE 3400.

**4920 [CROP 4600]. Topics in Agroecology: Research Apprenticeship. 1-2 (Max. 4).** Laboratory and/or field research apprenticeship. Emphasizes individual student-faculty interactions on current topics in agroecology. *Prerequisite:* AECL core courses.

**4930 [CROP/ENTO/SOIL 4903]. Internship in Agroecology. 1-3 (Max. 6).** Provides students with realistic views of crop science, entomology or soil science through practical, as well as work-related, experiences. Provides positive educational experience to supplement formal academic course work. *Prerequisites:* sophomore standing or higher; 2.5 GPA.

**4960 [PLPA 4000]. Agroecology Field Studies. 2.** Various facets of the agroecosystem are covered by visits to agricultural research stations, agri-businesses, private farms, national monuments, historical sites and Federal Parks. Students are exposed to ongoing sustainable research projects and innovative sustainable farming operations where a variety of cropping systems are utilized. Students are usually exposed to archaeological remains of ancient American Indian farming systems. An 8 day trip. *Prerequisite:* AECL 1000. (Offered as needed.)

**4990. Agroecology Seminar. 3. [WC◀▶COM3]** Capstone agroecology course for final integration of agroecology courses (AECL 2010, 3030, and LIFE 2023). Provides overall synthesis of these academic subjects following completion of a prescribed senior experience courses (AECL 4920 or 4930). (Offered spring semester)

**5400. Invasive Plant Ecology. 3.** Ecological Impacts of invasive, non-indigenous plant species, the ecological, genetic and evolutionary hypotheses for invasiveness, as well as man-

agement strategies for invasive plant species. Dual listed with AECL 4400; cross listed with RNEW 5400. *Prerequisite:* LIFE 3400.

## Plant Sciences (PLNT)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◆Q]).

**1101. First-Year Seminar. 3. [(none)◆FYS]**  
**1150 [CROP 1150]. Pesticide Safety and Application. 1.** Introduces various types and safe methods of pesticides application. Subsequent to completion, students may take the certification test administered by the Wyoming Department of Agriculture. Cross listed with ENTO 1150. Offered S/U only. (Normally offered during finals week of the fall semester)  
**2025. Horticultural Science. 3. [SB◆PN]** Propagation, growth, development and utilization of horticultural plants. Students gain an understanding of plant classification, anatomy, interactions with the environment, production and utilization. Taught on-line only through Outreach. *Prerequisites:* AECL 1000 or LIFE 1010.

**2026. Horticultural Sciences Laboratory. 1. [SB◆(none)]** Offers hands-on experience in many areas of horticulture. Students learn basic horticultural plant structures and functions, propagation methods, growing media and fertilizers, landscaping, pruning, etc. *Prerequisites:* AECL 1000 or LIFE 1010. (Offered fall semester)

**3000. Irrigated Agriculture. 3.** Study of the complexity of plant/soil water relationships and its importance on irrigation. Soil and water relations, reference/crops evapotranspiration and management of the water balance. Principles of chemigation, computer modeling/monitoring included. Methods for irrigation scheduling and the importance of water use efficiency as a strategy for water conservation. Cross listed with SOIL 3000. *Prerequisites:* MATH 1400, SOIL 2010.

**3036 [AECL 3036]. Grape Production. 3.** Introduces students to the science of viticulture. Topics include grapevine origin and distribution, taxonomy, morphology and physiology, soil and climatic requirements, vineyard establishment, grapevine nutrition, cultural practices, harvesting and post-harvest management. Successful completion will enhance students' knowledge and understanding on grape production and management. *Prerequisites:* PLNT 2025.

**3220 [PLPA 3220]. Plant Pathology. 3.** Study of plant diseases, their causes, nature and control, as well as pathogen biology. Study of diseases caused by fungi, bacteria, vi-

ruses, nematodes, mycoplasma-like organisms, higher plants and abiotic factors on field and vegetable crops, as well as on landscape plants. Gives students insight into the impact plant diseases have on humans. *Prerequisite:* AECL 1000 or LIFE 1010. (Offered fall semester of odd-numbered years)

**3300. Horticultural Plant Propagation. 3.** Emphasis on sexual and asexual propagation of various plants including herbaceous and woody crops. Seed propagation discussions include anatomy, physiology, dormancy, and enhancing seed viability and germination. Asexual propagation discussions center on anatomy and physiology of cuttings, adventitious root formation, budding, grafting, and tissue culture. *Prerequisite:* AECL or PLNT 2025. (Normally offered spring semester of even-numbered years)

**3400. Horticultural Plant Materials. 3.** Examines horticultural tree, shrub, vine, and ground cover varieties, cultivars and native species of horticultural use. It includes herbaceous, woody, deciduous, evergreen, annual, biennial and perennial species. Common and specific names as well as pertinent facts on each species are correlated to field identification. *Prerequisite:* AECL/PLNT 2025 or LIFE 2023. (Offered fall semester of even-numbered years)

**4000 [PLPA 4000]. Plant Disease Control. 3.** Advanced study of plant diseases. Important diseases of field, forage and horticultural crops will be studied. Includes history and current distribution and uses of crops. Emphasis will be placed on pathogen biology and development of integrated disease management. Current and classic research papers on plant disease control will be discussed. Dual listed with PLNT 5000. *Prerequisite:* PLNT 3220. (Normally offered fall semester of even-numbered years)

**4020. Sustainable Agriculture. 3.** Focuses on the sustainability of agroecosystems and the human communities that maintain them in the context of regional, national, and global food and fiber requirements. Topics include the scale of agriculture, low-input systems, current energy and transportation challenges, markets, and integrated crop and livestock production. Dual listed with PLNT 5020. *Prerequisite:* 8 hours of biology. (Offered spring semester of even-numbered years)

**4050. Plant Biotechnology. 3.** Introduces students to the science and applications of plant cell, tissue and organ culture, and regeneration. Topics include in vitro techniques used for developing new genotypes. Successful completion will enhance knowledge and un-

derstanding of plant tissue culture techniques and their applications in crop improvement. Dual listed with PLNT 5050. *Prerequisites:* LIFE 2023 or equivalent.

**4070 [CROP 4070]. Weed Science and Technology. 4.** Management and physiological principles involved in control of economically important farm and range weeds. Dual listed with PLNT 5070. *Prerequisite:* AECL 1000, LIFE 1010. (Normally offered fall semester)

**4120. Organic Food Production. 3.** A complete review of the federal organic production guidelines, methods and applications for organic production facilities, alternative marketing principles, concepts of organic fertilizer use, and organic pest control and concepts for organic crop and livestock agricultural systems. Dual listed with PLNT 5120. *Prerequisite:* AECL 1000 and 4 additional hours of PLNT or AECL coursework. (Normally offered fall semester of even-numbered years)

**4140. Turfgrass Science. 3.** Turfgrass management practices from a plant biology perspective. Adaptability and maintenance of turfgrass species that are used in landscape and sports turf. Includes common, low maintenance, and intensively managed special sports turf species; sports turf construction techniques; establishment; fertility and integrated pest management. *Prerequisite:* AECL/PLNT 2025 or LIFE 2023. (Normally offered spring semester of odd-numbered years)

**4160. Western Landscape Design. 4.** Designed for the challenges and limitations of high altitude landscaping with an emphasis on water use efficiency. Primary course concepts include construction using hard materials, xeriscaping principles, decreased water consumption using specialized irrigation systems and selection of native, adapted species, as well as basic landscape design principles. *Prerequisite:* PLNT 3400. (Normally offered spring semester of odd-numbered years)

**4180. Greenhouse Crop Production. 4.** Production methods for a wide range of herbaceous plants including bedding plants, perennials, vegetables, flowering potted plants, and foliage plants. Emphasis is placed on current production techniques in controlled environments and in the field. Dual listed with PLNT 5180. *Prerequisite:* PLNT 3300. (Normally offered spring semester of odd-numbered years)

**4190. Herbs, Spices and Medicinal Plants. 3.** Includes the history and importance of herbs, spices, and medicinals; collection of these plants in the wild; botany; chemistry; greenhouse and field production; organic production; harvesting; drying; postharvest



operations; legal aspects; and products. Dual listed with PLNT 5190. *Prerequisites:* 8 hrs. LIFE and/or CHEM.

**4200. Greenhouse Design and Management. 4.** Emphasis on greenhouse structural and functional design concepts of economy, efficiency and energy conservation. Primary emphasis is on the limitations and advantages of greenhouses in the Rocky Mountain region, including alternative energy concepts. The management and operational concerns associated with private, commercial, educational and public greenhouses will be included. Dual listed with PLNT 5200. *Prerequisites:* PLNT 2025 and a USP QA/Q course.

**4470 [CROP 4470]. Seed Science and Technology. 3.** Presents aspects of seed biology and processing including development, physiology, ecology, germination, viability, dormancy, production, conditioning, storage, certification and marketing. Dual listed with PLNT 5470. *Prerequisite:* 8 hours of plant biology. (Normally offered fall semester of even years)

**4520 [CROP 4520]. Plant Breeding. 3.** Principles and methods for genetic improvement of all kinds of plants including agronomic, horticultural, forest and range species. Emphasizes fundamental concepts of quantitative genetics and integration of classical plant breeding with emergent biotechnology. *Prerequisites:* MATH 1000 or statistics course; LIFE 4000. (Normally offered fall semester of odd-numbered years)

**4700 [CROP 2200, 3200; PLNT 3200]. Forage Crop Science. 3.** The course focuses on major aspects of forage crop production and biology. Cultural practices, adaptation, sustainable agriculture and alternative use, seed production, harvest, livestock utilization and storage of forages. This course will have in-depth emphasis on characteristics of important grasses and legumes and utilization of forages for livestock production. Dual listed with PLNT 5700.

**4790 [CROP 4700, 4790]. Topics: \_\_\_\_\_ 1-4 (Max. 10).** Dual listed with PLNT 5790. *Prerequisite:* senior standing. (Offered based on sufficient demand and resources)

**4900. Undergraduate Teaching Practicum. 1-2 (Max. 4).** Supervised participation of undergraduates in the teaching of laboratory sections offered by the Department of Plant Sciences. Provides opportunity for students to gain teaching experience in agroecology, horticulture, or life science. *Prerequisites:* AECL 1000 and junior or senior standing.

**4975. Problems in Plant Science. 1-2 (Max. 4).** Provides an opportunity for students to conduct supervised research on specific topics

of interest and importance in crop breeding, genetics, physiology, pathology, ecology and pest management. *Prerequisites:* junior/senior standing with at least 10 hours of agroecology core requirements.

**5000. Plant Disease Control. 3.** Advanced study of plant diseases. Important diseases of field, forage and horticultural crops are studied. Includes history and current distribution of crops. Emphasis is placed on pathogen biology and development of integrated disease management. Current and classic research papers on plant disease control are discussed. Dual listed with PLNT 4000. *Prerequisite:* PLNT 3220.

**5020. Sustainable Agriculture. 3.** Focuses on the sustainability of agroecosystems and the human communities that maintain them in the context of regional, national and global food and fiber requirements. Topics include: the scale of agriculture, low-input systems, current energy and transportation challenges, markets, and integrated crop and livestock production. Dual listed with PLNT 4020. *Prerequisite:* 8 hours of Life Sciences.

**5050. Plant Biotechnology. 3.** Introduces students to the science and applications of plant cell, tissue and organ culture, and regeneration. Topics include in vitro techniques used for developing new genotypes. Successful completion will enhance knowledge and understanding of plant tissue culture techniques and their applications in crop improvement. Dual listed with PLNT 4050. *Prerequisites:* LIFE 2023 or equivalent.

**5070. Weed Science and Technology. 4.** Management and physiological principles involved in control of economically important farm and range weeds. Dual listed with PLNT 4070. *Prerequisite:* AECL 1000, LIFE 1010.

**5120. Organic Food Production. 3.** A complete review of the federal organic production guidelines, methods and applications for organic production facilities, alternative marketing principles, concepts of organic fertilizer use, and organic pest control and concepts for organic crop and livestock agricultural systems. Dual listed with PLNT 4120. (Normally offered fall semester of even-numbered years)

**5180. Greenhouse Crop Production. 4.** Production methods for a wide range of herbaceous plants including bedding plants, perennials, vegetables, flowering potted plants, and foliage plants. Emphasis is placed on current production techniques in controlled environments and in the field. Dual listed with PLNT 4180. *Prerequisite:* PLNT 3300.

**5190. Herbs, Spices and Medicinal Plants. 3.** Includes the history and importance of herbs, spices, and medicinals; collection of

these plants in the wild; botany; chemistry; greenhouse and field production; organic production; harvesting; drying; postharvest operations; legal aspects; and products. Dual listed with PLNT 4190. *Prerequisites:* 8 hrs. LIFE and/or CHEM.

**5200. Greenhouse Design and Management. 4.** Emphasis on greenhouse structural and functional design concepts of economy, efficiency and energy conservation. Primary emphasis is on the limitations and advantages of greenhouses in the Rocky Mountain region, including alternative energy concepts. The management and operational concerns associated with private, commercial, educational and public greenhouses will be included.

**5380. Crop and Weed Ecology. 4.** Focuses on agroecosystems and the ecology of weeds. Main objective is to understand how ecological processes determine agroecosystem function and weed invasions. Some of the processes to be covered include: competition, succession, disturbance, nutrient cycling, diversity and evolution. *Prerequisites:* basic ecology course, senior standing with permission of instructor.

**5410. Advanced Crop Physiology and Management. 3.** Review and interpretation of current crop management and physiology literature. *Prerequisite:* 6 hours of biochemistry or plant physiology

**5470. Seed Science and Technology. 3.** Presents aspects of seed biology and processing including development, physiology, ecology, germination, viability, dormancy, production, conditioning, storage, certification and marketing. *Prerequisite:* 8 hours of plant biology.

**5500. Clinical Plant Pathology. 2.** Designed to give students practical experience in disease diagnosis. Students are exposed to a variety of current techniques used in the diagnosis and control of plant problems caused by abiotic and biotic factors. Primary emphasis is on the identification of biotic agents; including fungi, bacteria, nematodes and viruses. Students should gain experience and insight in the practical aspects of plant pathology. *Prerequisite:* PLNT 4000.

**5600. Research in Crops. 1-4 (Max. 10).** Investigation of research problems to include a written and oral presentation of results. *Prerequisite:* basic training in the field of problem selected.

**5700. Forage Crop Science. 3.** The course focuses on major aspects of forage crop production and biology. Cultural practices, adaptation, sustainable agriculture and alternative use, seed production, harvest, livestock utilization and storage of forages. This course will have in-depth emphasis on characteristics

of important grasses and legumes and utilization of forages for livestock production. Dual listed with PLNT 4700.

**5720. Plant Disease Problems. 1-3 (Max. 10).** Biology, epidemiology, and control of specific crop, field and forage diseases. *Prerequisite:* PLNT 3220.

**5790. Topics in Plant Sciences. 1-10 (Max. 10).** Dual listed with PLNT 4790. *Prerequisite:* senior standing.

**5820. Graduate Seminar. 1 (Max. 6).** Discussion in production, physiology, breeding and weed science. *Prerequisite:* basic training in plant sciences.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

## Department of Veterinary Sciences

Wyoming State Veterinary Laboratory,  
766-9925

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Department Head: William W. Laegreid

### Professors:

**HOLLY ERNEST**, B.Sc. Cornell University 1980; M.S. Ohio State University 1982; D.V.M. 1986; Ph.D. University of California, Davis 2001; Professor of Veterinary Sciences, Wyoming Excellence Chair in Disease Ecology 2014.

**FRANCIS D. GALEY**, B.S. Colorado State University 1981; D.V.M. 1983; Ph.D. University of Illinois, Urbana-Champaign 1988; Professor of Veterinary Sciences 1999; Dean, College of Agriculture and Natural Resources, 2001.

**WILLIAM W. LAEGREID**, B.S. Washington State University 1980; M.S. Washington State University 1984; D.V.M. Washington State University 1985; Ph.D. Washington State University 1988; Professor, Head of the Department of Veterinary Sciences and Director of the Wyoming State Veterinary Laboratory 2012.

**DONAL T. O'TOOLE**, M.V.B. Trinity College, Dublin, Ireland 1977; Ph.D. Colorado State University 1982; Professor of Veterinary Sciences 1998, 1990.

**MERL F. RAISBECK**, B.S. Colorado State University 1973; D.V.M. 1975; M.S. University of Missouri 1982; Ph.D. 1984; Professor of Veterinary Sciences 1995, 1988.

### Associate Professors:

**GERARD P. ANDREWS**, M.S. University of New Hampshire 1983; Ph.D. Uniformed Services University of Health Science 1993; Associate Professor of Veterinary Sciences 2011, 2004.

**TODD E. CORNISH**, B.S. University of California-Davis 1990; D.V.M. 1994; Ph.D. University of Georgia 1999; Associate Professor of Veterinary Sciences 2005, 1999.

**JONATHAN H. FOX**, B.Sc., B.V.Sc. University of Liverpool, UK 1993; Ph.D. Virginia Tech 2002; Associate Professor of Veterinary Sciences 2008, 2012.

### Assistant Professors:

**JEFFREY J. ADAMOVICZ**, B.S. University of Northern Iowa 1984; Ph.D. Uniformed Services University of Health Sciences 1996; Registered Biosafety Professional 2010; Assistant Professor of Veterinary Sciences 2011.

**MYRNA M. MILLER**, D.V.M. Colorado State University 1984; Ph.D. Cornell University 2005; Assistant Professor of Veterinary Sciences 2010.

**BRANT A. SCHUMAKER**, D.V.M. University of California, Davis 2005; Ph.D. 2010; Assistant Professor of Veterinary Sciences 2010.

**KERRY SONDEGROTH**, B.A. University of New Hampshire 1997; D.V.M. Colorado State University 2006; Ph.D. Washington State University 2013; Assistant Professor of Veterinary Sciences 2014.

### Adjunct Professors:

**BARBARA S. DROLET**, B.S. University of Wyoming 1986; M.S. 1989; Ph.D. Oregon State University 1994; Adjunct Professor of Veterinary Sciences 2002.

**BRUCE R. HOAR**, D.V.M. University of Saskatchewan 1985; M.S. 1996; Ph.D. University of California, Davis 2001; Adjunct Professor of Veterinary Sciences 2014.

**GEOFFREY J. LETCHWORTH**, B.S. Trinity College 1965; D.V.M. New York State College of Veterinary Medicine 1972; Ph.D. Cornell University 1980; Adjunct Professor of Veterinary Sciences 2001.

**HERMANN SCHÄTZL**, M.D. Max von Pettenkofer for Microbiology and Hygiene, Germany 1991; Wyoming Excellence Chair - Prion Biology 2010; Adjunct Professor of Veterinary Sciences 2012.

The Department of Veterinary Sciences and the Department of Animal Science have combined their efforts to offer B.S., M.S., and Ph.D. degrees in animal and veterinary science (see listing under this title). Several options within the major are available including preveterinary medicine and animal biology. Undergraduate course offerings of the Department of Veterinary Sciences are listed under the title of pathobiology. They were designed to familiarize students with the principles of animal disease and the basic biological and biomedical sciences.

The department operates the Wyoming State Veterinary Laboratory, an animal disease diagnostic laboratory ([wyovet.uwyo.edu](http://wyovet.uwyo.edu)). This laboratory provides valuable hands-on experience for students interested in laboratory animal care, laboratory procedures, and research. Excellent faculty advisers are available for students interested in preveterinary medicine, microbiology, and animal biology.

## Graduate Study

The Department of Veterinary Sciences offers advanced study leading to the master of science and doctor of philosophy in animal and veterinary science. Areas of emphasis include: pathology, molecular diagnostics, bacteriology, virology, parasitology, epidemiology, immunology, and toxicology of wild and domestic animals.

### Program Specific Admission Requirements

Open to students with a bachelor of science degree who meet the requirements set forth in this Catalog.

Recommended prerequisites include: chemistry, biochemistry, animal anatomy and physiology, biology, microbiology, and introductory statistics.

## Program Specific Degree Requirements

### Master of Science

Only offered as Plan A

A minimum of 30 credit hours including 4 thesis hours must be earned in 4000-5999 level courses.

Two semesters of graduate seminar (PATB 5515) and STAT (5050) or their equivalents are required.

The program of study is arranged with the student's graduate committee.

### Doctoral Program

A 72 hour program.

Students must meet the university minimum requirements.

### Preferred Requirements

Competitive applicants for either degree program will have a GPA 3.25 or higher and high GRE scores (153 verbal, 149 quantitative, 302 total using best composite scores).

## Pathobiology (PATB)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

**1001. Discovering Careers in Veterinary Medicine. 1. [I,L♦♦(none)]** Career paths open to veterinarians are diverse including private practice, clinical specialties, basic/applied sciences like environmental/public health, preventive medicine, military service, microbiology and research. Additional topics: veterinary college application process, financing veterinary education, personal time /stress management of choosing a career in veterinary medicine and animal health.

**1101. First-Year Seminar. 3. [(none)♦♦FYS]**  
**2220. Pathogenic Microbiology. 4.** Major communicable diseases of man caused by bacteria, mycoplasma. Discusses disease, diagnosis, treatment, prevention, and transmission. Cross listed with MICR 2220. *Prerequisite:* MICR 2210. (Offered spring semester)

**4001. Epidemiology (Diseases in Population). 3.** Basic epidemiologic concepts and approaches to population problems in medicine, with examples from veterinary and human health. Covers a wide spectrum of topics and introduces practical applications of epidemiology. Dual listed with PATB 5001; cross listed with MICR 4001. *Prerequisite:* STAT 2050 or STAT 2070.

**4050. Problems in Animal Disease. 1-4 (Max. 6).** Offers opportunity for supervised investigation of animal disease problems involving techniques of bacteriology, mycology, virology, gross pathology, histopathology and/or toxicology. *Prerequisites:* 12 semester hours of biological science and consent of instructor; MOLB 2021 is recommended for most students.

**4100. Laboratory Animal Care and Management. 2.** Informs junior, senior and graduate students of basic principles of care and management of the common laboratory animals used for research or as animal models of human disease. *Prerequisite:* 8 semester hours of biological science.

**4110. Diseases of Food Animals. 3.** Acquaints students with diseases of cattle, sheep, swine and poultry. Dual listed with PATB 5110. *Prerequisite:* LIFE 2022. (Normally offered spring semester)

**4111. Equine Health and Disease. 3.** To familiarize students with identification, prevention and treatment of diseases in horses through proper health management techniques. Dual listed with PATB 5111. Cross listed with ANSC 4111. *Prerequisites:* ANSC 1030, ANSC 3150.

**4130. Mammalian Pathobiology. 3. [(none)♦♦COM3]** Anatomical basis of disease in mammals. Emphasis on concepts of pathogenesis of disease, and the gross, microscopic and clinicopathological changes associated with lesions: cell injury and death; cellular degeneration; disturbances of growth and circulation; neoplasia; inflammation; and recognition of gross and microscopic tissue changes. Background in immunology will be beneficial. Dual listed with PATB 5130; cross listed with MICR 4130. *Prerequisite:* C or better in LIFE 2022. (Normally offered spring semester)

**4140. Principles of Toxicology. 3.** Toxicology is the study of poisons, their mechanisms of action and their effects on various organisms including man and domestic animals. Designed to provide students in the life and environmental sciences with an understanding of the principles of toxicology as they apply to animal and human health, food safety and environmental studies. Dual listed with PATB 5140. *Prerequisite:* 9 hours of biological science (e.g., physiology), 4 hours chemistry, 3 hours biochemistry. (Normally offered fall semester of even-numbered years)

**4150. Seminar. 1 (Max. 4).** Preparation and oral presentation of papers on veterinary sciences topics. S/U Only. *Prerequisites:* 8 hours of biology and consent of instructor.

**4170 [4120]. Diseases of Wildlife. 3.** Introduction to wildlife diseases of the Rocky Mountain region and North America. Emphasis on infectious, parasitic, traumatic, toxic, and other disease agents with coverage of mechanisms of disease, epidemiology, and disease impacts on wildlife populations and species. Significant discussion of zoonotic diseases and diseases at the wildlife/domestic animal interface. Dual listed with PATB 5170. *Prerequisite:* 12 hours of biological or zoological sciences. (Offered spring semester of even-numbered years)

**4200. Diagnostic Bacteriology. 1.** Practical training with emphasis on diagnostic procedures used in a clinical microbiology laboratory. Students will identify bacterial pathogens of animals and humans. Taught in a clinical setting utilizing selected clinical material. Techniques employed in the processing and identification of clinically significant bacteria will be used and discussed. Safe laboratory practices for working with biohazards will be presented. Cross listed with MICR 4200. *Prerequisites:* junior standing and a microbiology course which included a laboratory.

**4220. Molecular Mechanisms of Bacterial Pathogenesis. 3.** Intended for students majoring in microbiology or a related field. The class will consist of lectures and small group decisions. Student responsibilities will include note-taking and preparation for discussion by completion of reading assignments consisting of classic and/or recent journal articles addressing the weekly topic. Cross listed with MICR 4220; dual listed with PATB 5220. *Prerequisites:* PATB/MICR 2220 and statistics (or epidemiology).

**4310. Introduction to Veterinary Parasitology. 3.** For animal science, zoology, biology or preveterinary majors. Discusses parasites of food producing and companion animals and uses preserved parasites in lecture and laboratory. *Prerequisite:* 8 hours of biological science. (Normally offered fall semester)

**4320. Problems in Parasitology. 1-3 (Max. 5).** Individual laboratory, library or field study of parasites and their host relations. *Prerequisites:* 8 semester hours of biological sciences or 3 semester hours of parasitology and consent of instructor.

**4360. Medical Entomology and Parasitology. 4.** Emphasis is on medically important arthropods, protozoa, and worms; clinical effects of infection, epidemiology, avoidance/control and identification/diagnosis. Cross listed with ENTO 4360; dual listed with PATB 5360. *Prerequisite:* 8 hours of biological science. (Normally offered fall semester of odd-numbered years)

**4400. Immunology. 4.** Biology of immune system; cellular and molecular mechanisms; host resistance to infectious agents; as well as hypersensitivities, autoimmunity, tumor and tissue rejection. Includes laboratory for immunological techniques. Cross listed with MOLB 4400. Dual listed with PATB 5400. (Normally offered spring semester)

**4500. Veterinary Parasitology. 4.** Biology, importance, diagnosis and control of helminth and protozoan parasites of wild and domestic animals. Arthropod vectors and/or intermediate hosts of helminth & protozoan parasites are included. Diagnostic procedures and identification familiarity with agents are emphasized in lab. *Prerequisite:* 8 hours of biological science. (Offered fall semester of even-numbered years)

**4710. Medical Virology. 3.** Human and animal viruses as biological entities. Methods of study, classification, replication strategies, diagnostic approaches, epidemiology and significance as disease agents. Dual listed with PATB 5710. Cross listed with MICR 4710. *Prerequisite:* MOLB 2240. (Normally offered fall semester)

**5001. Epidemiology (Diseases in Population). 3.** Basic epidemiologic concepts and approaches to population problems in medicine, with examples from veterinary and human health. Covers a wide spectrum of topics and introduces practical applications of epidemiology. Dual listed with PATB 4001; cross listed with MICR 5001. *Prerequisite:* STAT 2050.

**5110. Diseases of Food Animals. 3.** Acquaints students with diseases of cattle, sheep, swine and poultry. Dual listed with PATB 4110. *Prerequisite:* LIFE 2022. (Normally offered spring semester)

**5111. Equine Health and Disease. 3.** To familiarize students with identification, prevention and treatment of diseases in horses through proper health management techniques. Dual listed with PATB 4111. Cross listed with ANSC 5111. *Prerequisites:* ANSC 1030, ANSC 3150.

**5120. Topics in Pathobiology. 1-4 (Max. 8).** Lectures in current pathobiology topics derived from the expertise of the lecturer. *Prerequisite:* 12 hours of biological sciences and consent of instructor.

**5130. Mammalian Pathobiology. 3.** Anatomical basis of disease in mammals. Emphasis on concepts of pathogenesis of disease, and the gross, microscopic and clinicopathological changes associated with lesions: cell injury and death; cellular degeneration; disturbances of growth and circulation; neoplasia; inflammation; and recognition of gross and microscopic

tissue changes. Background in immunology will be beneficial. Dual listed with PATB 4130.

*Prerequisites:* C or better in LIFE 2022.

**5140. Principles of Toxicology. 3.** Toxicology is the study of poisons, their mechanisms of action, and their effects on various organisms including man and domestic animals. Designed to provide students in the life and environmental sciences with an understanding of the principles of toxicology as they apply to animal and human health, food safety and environmental studies. Dual listed with PATB 4140. *Prerequisite:* 9 hrs. biological science (eg. physiology), 4 hrs. chemistry, 3 hrs. biochemistry.

**5160. Neurologic diseases: mechanisms and therapeutic approaches. 3.** We will use lectures, student presentations and discussions to learn about impacts, molecular mechanisms and prospects for effective therapy of some important neurologic diseases of man and animals. Disorder we will study will include chronic traumatic encephalopathy, Alzheimer's disease, prion diseases, stroke and epilepsy. Cross listed with NEUR 5160. *Prerequisite:* Courses in neuroanatomy and biochemistry; graduate level standing. (Normally offered fall semester of odd-numbered years)

**5170. Diseases of Wildlife. 3.** Introduction to wildlife diseases of the Rocky Mountain region and North America. Emphasis on infectious, parasitic, traumatic, toxic, and other disease agents with coverage of mechanisms of disease, epidemiology, and disease impacts on wildlife populations and species. Significant discussion of zoonotic diseases and diseases at the wildlife/domestic animal interface. Dual listed with PATB 4170. *Prerequisites:* 12 hours of biological or zoological sciences.

**5220. Molecular Mechanisms of Bacterial Pathogenesis. 3.** Intended for students majoring in microbiology or a related field. The class consists of lectures and small group discussions. Student responsibilities will include note-taking and preparation for discussion by completion of reading assignments consisting of classic and/or recent journal articles addressing the weekly topic. Dual listed with PATB 4220; cross listed with MICR 5220. *Prerequisites:* PATB/MICR 2220 and statistics (or epidemiology).

**5360. Medical Entomology/Parasitology. 4.** Emphasis is on medically important arthropods, protozoa and worms; clinical effects of infection, epidemiology, avoidance/control and identification/diagnosis. Dual listed with PATB 4360. *Prerequisite:* 8 hours of biological science.

**5400. Immunology. 4.** Biology of the immune system; cellular and molecular mechanisms; host resistance to infectious agents; as well as hypersensitivities, autoimmunity, tumor and tissue rejection. Includes laboratory for immunological techniques. Students are required to complete a term paper and make a presentation. Dual listed with PATB 4400; cross listed with MOLB 5400.

**5500. Veterinary Parasitology. 4.** Biology, importance, diagnosis and control of helminth and protozoan parasites of wild and domestic animals. Arthropod vectors and/or intermediate hosts of helminth & protozoan parasites are included. Diagnostic procedures and identificational familiarity with agents are emphasized in lab. *Prerequisite:* 8 hours of Biological Science.

**5505. Investigations in Pathobiology. 1-4 (Max. 8).** Research involvement in pathobiology to learn laboratory methods, scientific literature, research design and data analysis and presentation. *Prerequisite:* graduate standing and/or consent of instructor and 16 hours of biological sciences.

**5510. Introductory Virology. 3.** Prokaryotic and eukaryotic viruses as infectious agents and models for modern molecular biology. Examines concepts and principles of pathogenesis, host response and the regulation of virus-host interactions. Genome organization, structure and replication will be examined within the context of the co-evolution of virus and host. Cross listed with MOLB 5510. *Prerequisite:* MOLB 3610 or 4600 plus 4610.

**5515. Advanced Seminar in Pathobiology. 1 (Max. 4).** Preparation and presentation of research topics in pathogeology with participation in discussions. *Prerequisite:* graduate standing and/or consent of instructor and 16 hours of biological sciences.

**5710. Medical Virology. 3.** Human and animal viruses as biological entities. Methods of study, classification, replication strategies, diagnostic approaches, epidemiology and significance as disease agents. Dual listed with PATB 4710.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).**

Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).**

Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).**

Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

## Aims and Objectives

The College of Arts and Sciences (A&S) is committed to providing a balanced education that matches cultural breadth with disciplinary depth. Students in the College of Arts and Sciences learn to address complex contemporary problems and to place them in their wider social, historical and ethical contexts. To achieve these goals, degree programs require students to develop expertise in a particular field, gain critical understanding of major areas of human knowledge and select from required courses and free electives to prepare for the challenges of the new century.

A successful student in any of the departments and programs in the College of Arts and Sciences will have an excellent foundation for professional success, graduate study, and a passion for lifelong learning.

Through hands-on research and creative projects (either on faculty projects or independently with faculty guidance and mentoring), fieldwork, internships, and study abroad, students integrate and bring coherence to their classroom learning.

## Student Responsibilities

To graduate from the College of Arts and Sciences, students must satisfy all university, college, and major requirements for a given degree. These requirements apply whether the work is taken within the college or transferred from anywhere else within or outside the university (please refer to section below "Acceptance of Transfer Credit").

The college holds students responsible for knowing degree and major requirements and for completing the necessary courses. Students are also expected to know the regulations that govern the academic standards needed to continue study at the university. Students should be aware that changing majors and/or colleges may result in delays in meeting degree requirements and that requirements themselves sometimes change (see "Graduation: Requirements and Procedures" section of this *Catalog*).

## Academic Advising

To help plan a program of study, students are assigned an academic adviser by the department/program of their major. Students undecided about a major are advised in the UW Center for Advising and Career Services (222 Knight Hall).

Students should consult regularly with their academic adviser not only for course scheduling, but also to discuss educational and career goals. Faculty and professional advisers can connect students to the many college and university resources to assist undergraduate study. Instructors are also willing to discuss concerns students may have regarding specific courses.

## Changing/Declaring a Major or Minor

When ready to declare or change a major, minor, or dual/concurrent major in a department or program in the college, the appropriate form is available from the Office of the Registrar (167 Knight Hall) or the Registrar's Web page. Approval is required from the appropriate department heads/program directors. Departments/programs will assign advisors at the time of signing their approval on the form.

## Programs of Study

### *Undergraduate Degrees*

A variety of specialized concentrations are offered within many of the following degree programs. Take a look at the department sections in this *Catalog* that follow this section or the departments' Web sites. Additionally, there are several inter-college or interdisciplinary degrees/majors such as Microbiology, Earth System Science, and the affiliated major in Environment and Natural Resources that draw courses from several disciplines. See more detailed descriptions in this *Catalog* or the University of Wyoming home page at [www.uwyo.edu](http://www.uwyo.edu), click on the A-Z Directory.

### *Bachelor of Arts*

- American Indian studies
- American studies
- Anthropology
- Art
- Art History
- Chemistry
- Communication
- Criminal justice
- English

- French
- Geography
- Geology and Earth sciences
- Gender and Women's Studies
- German
- History
- Humanities/fine arts
- International studies
- Journalism
- Mathematics
- Mathematics/science
- Music
- Philosophy
- Physics
- Political science
- Religious studies
- Russian
- Self-designed major
- Social science
- Sociology
- Spanish
- Statistics
- Theatre and dance

### *Bachelor of Science*

- Astronomy/astrophysics
- Biology
- Botany
- Chemistry
- Chemistry (ACS approved)
- Communication
- Environmental geology/geohydrology
- Geography
- Geology
- Journalism
- Mathematics
- Mathematics/science
- Physics
- Physics (Plus) {affiliated concentration}
- Physiology
- Political science
- Psychology
- Self-designed major
- Social science
- Sociology
- Statistics
- Wildlife and fisheries biology and management (*professional*)
- Zoology

### *Bachelor of Fine Arts*

- Art
- Theatre and dance

### *Bachelor of Music*

- Music education
- Music performance

## Graduate Degrees

### **Master of Arts**

American studies (*interdisciplinary*)  
 Anthropology  
 Communication  
 English  
 French  
 Geography  
 German  
 History  
 International studies (*interdisciplinary*)  
 Journalism  
 Mathematics  
 Philosophy  
 Political science  
 Psychology  
 Sociology  
 Spanish

### **Master of Science**

Botany  
 Chemistry  
 Geology  
 Geophysics  
 Mathematics  
 Natural science (*interdisciplinary*)  
 Physics  
 Psychology  
 Reproductive biology  
 Statistics  
 Zoology and physiology

### **Master of Arts in Teaching**

History  
 Mathematics

### **Master of Fine Arts in Creative Writing**

### **Master of Music**

### **Master of Music Education**

### **Master of Planning**

(*community and regional*)

### **Master of Public Administration**

### **Master of Science in Teaching**

Chemistry  
 Geography  
 Mathematics  
 Natural science (*interdisciplinary*)  
 Physics

### **Doctor of Philosophy**

Anthropology  
 Botany  
 Chemistry  
 Geology  
 Geophysics  
 Mathematics  
 Physics  
 Psychology

Reproductive biology  
 Statistics  
 Zoology and physiology

## Minors in Arts and Sciences

The College of Arts and Sciences offers all university students systematic studies leading to recognized academic minors. Minors are available in all academic programs in the college and in a number of interdisciplinary areas.

A&S minors have two aims: to encourage students to create a focus for their course work outside their major by coordinating their elective studies; and to enhance chances of employment or graduate admission with a formally recognized field of study.

Minors consist of course requirements ranging from 18-24 credit hours of study, typically including significant work at the junior and senior level. A&S departments and programs offering minors and interdisciplinary degrees may have further conditions and restrictions regarding requirements in the minor. To be counted toward a minor, courses must be completed with a grade of C or better.

Students desiring a minor must notify the department in which the minor is offered. Forms for declaring a minor are available in the Office of the Registrar (167 Knight Hall) or on the Registrar's Web page. The department of the minor will assign an adviser.

For a description of the minors in A&S, see department offices or Web sites.

### **Minors available in the College of Arts and Sciences include:**

African American and Diaspora Studies  
 American Indian Studies  
 American Studies  
 Anthropology  
 Art  
 Art history  
 Ceramics  
 Drawing  
 Graphic Design  
 Metalsmithing  
 Museum Studies  
 Painting  
 Photography  
 Printmaking  
 Sculpture  
 Biology  
 Botany  
 Chemistry  
 Communication and journalism  
 Communication  
 Journalism  
 Marketing Communication  
 Public Relations

Criminal Justice  
 Criminal Justice  
 Prelaw  
 English  
 Creative writing  
 Literary studies  
 Professional writing  
 Ethnomusicology  
 Gender and Women's Studies  
 Gender and Women's Studies  
 Queer Studies  
 Geography  
 Geographic Information Sciences  
 Geography  
 Planning  
 Geology/geophysics  
 Geology  
 History  
 International studies  
 Asian studies  
 European studies  
 International studies  
 Latina/o Studies  
 Mathematics  
 Modern and classical languages  
 Chinese  
 Classical Civilization  
 French  
 German  
 Japanese  
 Latin  
 Russian  
 Spanish  
 Music  
 Paleoenvironmental studies  
 (interdisciplinary)  
 Philosophy  
 Environmental values  
 Ethics  
 Philosophy  
 Physics/astronomy  
 Astronomy  
 Physics  
 Political science  
 American politics  
 International relations and  
 comparative government  
 Political theory  
 Public law  
 Psychology  
 Religious studies  
 Remote Sensing  
 Sociology  
 Statistics  
 Theatre and dance  
 Dance  
 Theatre  
 Wildlife and fisheries biology  
 and management

Zoology/physiology  
 Animal and human physiology  
 Neuroscience  
 Zoology

## College Degree Requirements- The 2015 A&S Core Bachelor of Arts or Science Programs

Beginning fall 2015, new university and college general education curricula, the 2015 University Studies Program (USP) and the 2015 A&S Core, were implemented. Refer to the USP section of this *Catalog* for details regarding University Studies requirements. Students who matriculate for the first time at UW or a Wyoming community college in fall 2015 or after are required to follow both the new USP and A&S Core. Students transferring from a Wyoming community college with an associate's degree and the Wyoming Core completed between May 2013 and fall 2015, may continue to complete the 2003 USP and 2003 A&S Core requirements (if there has been no interruption in their enrollment for a year or more). Students who matriculated at UW or a Wyoming community college prior to fall 2015 and choose the 2015 USP must also complete the 2015 A&S Core requirements. For additional information please refer to the sections in this *Catalog* that describe the university graduation requirements, the 2015 University Studies Program, and the policies for reenrolling at UW after an absence of a year or more.

### I. College credit hour requirements

- A. Minimum total semester hours 120**  
 Professional degree programs require 128 hours.
- B. Upper-division credit requirements (42).** Thirty of the 42 hours must be earned from UW. Courses must be taken for a letter grade unless offered for S/U only. This is an all-university requirement for all degree programs and may come from the courses that fulfill the USP, the A&S Core, the major, the minor, and electives.
- C. Major field of study (30-60).** Credit hours in excess of 60 in the major subject may not be used to satisfy the requirement of 120 hours for graduation (excludes the A&S professional degree programs which require 128 credit hours). At least 30 hours of C grade or better must be earned in the major subject (the major

may require more). Courses in the major must be taken for a letter grade unless offered for S/U only.

- D. A&S Core requirements (6).** Courses must be taken for a letter grade unless offered for S/U only.

All other university and college regulations apply. See "Graduation: Requirements and Procedures" section of this *Catalog* for more information. Graduate level "Enrichment" courses do not count toward the requirements for a bachelor's degree.

### II. 2015 A&S Core Curriculum

Graduates of the College of Arts and Sciences are expected to be liberally educated, to have the knowledge and skills to deal with the unexpected, and to see opportunities from multiple perspectives. To develop these abilities, the college faculty implemented the A&S Core.

The approved courses for the following requirements are searchable within WyoRecords under the Look-Up Classes feature.

- 1. U.S. Diversity (ASD).** This requirement allows students to explore the complexity of cultural identities in the U.S. and interdependence of the cultures. Students will gain an understanding of the influences of categories such as race, class, ethnicity, gender, disability, sexual orientation, religion, and age on American behaviors, institutions, values, and beliefs.
- 2. Global Awareness (ASG).** Because citizens ever more frequently encounter behaviors and practices based on beliefs, conditions, and assumptions different from their own, they need to understand the nature and function of culture. Our students should have an awareness of the multiple links that affect the living conditions and range of action of peoples of the world, including international systems of commerce, art, science, technology, politics, communication, belief, and justice, among other.

### College Degree Requirements Prior to Fall 2015 for Continuing and Reenrolling Students

A&S Core requirements for a student continuing a degree program in effect at the time of matriculation at UW are found in the relevant previous *Catalog*. Contact the Dean's office with any questions.

Students who re-enter the university after an absence of a year or more should refer to other sections of this *Catalog* for university policies and procedures. Unless approved otherwise, reenrolling students, after a year's absence, are required to follow the University Studies and A&S Core requirements in effect the semester of their re-enrollment. However, all majors in A&S who have yet to complete the A&S Core, regardless of their initial enrollment, must refer to the current list of approved courses.

Checksheets and lists of courses that satisfy A&S college core requirements are available on the Web at [www.uwyo.edu/as](http://www.uwyo.edu/as) or in the Dean's office.

Departments and programs in the College of Arts and Sciences may require reenrolling students to complete requirements in the major that meet the current expectations of the discipline.

### Transfer Students and Acceptance of Transfer Credit

The College of Arts and Sciences and its departments reserve the right to grant transfer credit toward the bachelor's degree only for those courses where a grade of C or better was earned. Students transferring credits from a university or college outside Wyoming with questions about how courses taken elsewhere fulfill the A&S Core may contact the Center for Advising and Career Services (222 Knight Hall, 766-2398).

### Courses Taken for S/U Credit

Students may include up to 20 semester credit hours in free electives with a grade of S as part of the total hours required by the College of Arts and Sciences for graduation. However, no S/U hours may be used to satisfy university and college core general education requirements or major requirements, including the required 42 upper-division credit hours unless the course is offered for S/U grading only.

Students registering in courses for S/U grades are subject to all general regulations.

### Professional Degree Programs

Professional curricula are available in seven fields. A minimum of 128 hours is required. Students enrolled in professional curricula must earn a grade of C or better in the major and fulfill all other college and university requirements including at least 42 hours of course work at the upper-division level with 30 of these from UW. Students should verify curriculum requirements with the appropriate



department and/or the college dean's office. The eight professional programs consist of the following:

Art	B.F.A.
Chemistry (ACS certified)	B.S.
Music Education	B.M.
Music (Performance)	B.M.
Physics Plus	B.S.
Theatre and dance	B.F.A.
Wildlife and fisheries biology and management	B.S.

## Concurrent Majors

Students may pursue two or more majors simultaneously. With careful planning, A&S students may be able to use all or most of the free elective hours for requirements in the other majors. Refer also to the section, "Graduation: Requirements and Procedures" in this *Catalog*.

The A&S Core must be met only once by students whose primary major is in the College of Arts and Sciences. Students whose degree programs are in other UW colleges are welcome to earn a concurrent major in A&S. These students do not have to meet the A&S Core requirements. The student earns one degree with one diploma.

Students pursuing a concurrent major must contact both departments involved for assignments to advisers.

## Dual Degrees

Students may simultaneously pursue degrees in the same or more than one UW college. In addition to requirements described in the section "Graduation: Requirements and Procedures" in this *Catalog*, students in another UW college who wish to earn a degree from A&S must also complete the A&S Core. A&S students working on dual degrees in the A&S College need to meet the A&S Core just once. A diploma is awarded for each degree.

Each additional degree requires 30 more credit hours added to the 120 credits (or 128 for professional degrees) to the primary degree. Of these 30 credits, 12 have to be at the 3XXX-4XXX levels.

## Second Bachelor's Degrees

For students seeking a second bachelor's degree in the College of Arts and Sciences whose **first degree is from another university**, the minimum requirements include:

- 30 semester hours earned from the University of Wyoming, 12 of which must be upper division (3XXX-4XXX level) or graduate level (credit by examination does not count as UW hours).
- Completion of the U.S. and Wyoming Constitutions requirement (V courses in the University Studies Program course list in this *Catalog*).
- If the first degree is from an institution where English is not the predominant language, the COM1 and COM2 requirements of the University Studies Program must be completed successfully.
- Students must also meet the 2015 A&S Core requirements.

For students whose **first degree is from UW**:

- The additional required 30 hours (12 of these at the 3XXX-4XXX) are added to the degree requiring the least number of hours. For example, for a first degree in a non-professional program, A&S requires 120 hours. So the total credits a UW student would have to complete for the second bachelor's degree is a minimum of 150 credits. Since the University requires a total of 42 upper division hours for a degree, for the second degree from A&S, a UW student would need to earn a total of 60 hours at the 3XXX-4XXX level. For more information, please see the Second Bachelor's Degree entry in the section, "Graduation: Requirements and Procedures" in this *Catalog*.
- Students whose **first degree is from another UW college** must meet the 2015 A&S Core requirements.
- In situations in which a student is subsequently required to take coursework from another collegiate institution to fulfill major and overall hour requirements for a second degree from the university, the student's department can ask the Office of the Registrar to load selected courses into the student's record.

## Distributed Majors Degree Programs

The specific requirements for majors in humanities/fine arts, mathematics/science and social science are outlined below. Required courses in these majors are selected

from several A&S departments and in some cases, outside the college. The basic college requirements are those as described above for the Bachelor of Arts or Science degrees. Appropriate courses from outside A&S may be substituted after consultation with the adviser.

## 1. Humanities and Fine Arts (B.A. only)

To fulfill the 42 credit hours required in the major, the student selects three areas of emphases from the participating departments/programs with a minimum distribution of 18 hours in the first area of emphasis and 12 hours in each of the two other areas. Participating departments/programs include American Studies, African American and Diaspora Studies, American Indian studies, anthropology, art, Latina/o studies, communication and journalism, English, history, modern and classical languages, music, philosophy, political science, religious studies, theatre and dance, and women's studies. See the A&S dean's office or the Web at [www.uwyo.edu/as/majors-and-minors/index.html](http://www.uwyo.edu/as/majors-and-minors/index.html) for approved courses and detailed checksheet.

In addition to the 42 hours in this major, students are required to take 12 hours of a single foreign language, or the equivalent (American Sign Language is acceptable) with a grade of at least a C. Only classics 2010 and 2020 and other language courses numbered above 2030 may be counted toward the 42 hours in the major.

The 42 credits must include:

- At least 24 credit hours of upper division courses are required in the major with a distribution of at least 12 credits in one area of emphasis and 6 credits in a second area.
- A grade of C or better must be earned in all 42 credit hours in the major and all courses must be taken for a letter grade unless offered for S/U only.

A maximum of 4 credit hours of music lessons and dance technique courses may apply.

Students may not minor in the department/program that is selected as the first area of emphasis.

All other university and college degree requirements apply.

Students pursuing this major may go to the Department of Philosophy in Ross Hall for assignment to an adviser.

## 2. Social Science (B.A. or B.S.)

To fulfill the 48 credit hours required in the major, the student selects four core areas of emphasis from the participating departments/programs, with a minimum distribution of 15 credit hours in the first area of emphasis and 6 hours in each of the other three areas. Participating department/programs include African American and Diaspora studies, American Indian studies, American studies, anthropology, Latina/o studies, communication and journalism, criminal justice, economics, geography, history, philosophy, political science, psychology, sociology, and women's studies. The first area of emphasis cannot be in economics or philosophy. See the A&S dean's office or the Web at [www.uwyo.edu/as/majors-and-minors/index.html](http://www.uwyo.edu/as/majors-and-minors/index.html) for approved courses and detailed checksheet.

The 48 credits must include:

- STAT 2050 or 2070. These also fulfill the Q requirement for the University Studies Program (USP).
- A USP-approved COM3 course that is also an approved College of Arts and Sciences social science discipline course.
- A minimum of 24 credit hours of upper-division courses in the major. At least one course, 3 credits, in the first area of emphasis must be at the 4XXX level.
- A grade of C or better must be earned in all 48 credit hours in the major and all courses taken for a letter grade unless offered for S/U only.

It is also recommended that students complete an upper-division social science research methods and a social science theory course. See the list of Approved courses.

Courses taken for the U.S./Wyoming Constitutions requirement do not count in the 48 credit hours in this major.

Students may not minor in the department/program that is selected as the first area of emphasis.

All other university and college degree requirements apply.

Students pursuing this major may go to the Center for Advising and Career Services in Knight Hall, room 222, for assignment to an adviser.

## 3. Mathematics and Science (B.A. or B.S.)

To fulfill the 48 credit hours required in the major, the student selects four core areas of emphases from the participating departments/programs, with a minimum distribution of 8 credit hours in each of the four areas. Participating departments/programs include anthropology, biology, botany, chemistry, geography, geology and geophysics, mathematics, physics and astronomy, psychology, statistics, and zoology and physiology. See the A&S Dean's office or the web at [www.uwyo.edu/as/majors-and-minors/index.html](http://www.uwyo.edu/as/majors-and-minors/index.html) for approved courses and detailed checklist. One of the four core areas may be outside the College of Arts and Sciences, if in a related science/math area.

The 48 credits must include:

- A minimum of 24 credits of upper-division courses must be earned across at least three of the core areas with at least 3 upper-division credits in each core area.
- A grade of C or better must be earned in all 48 credit hours in the major and all courses taken for a letter grade unless offered for S/U only.

At least 12 hours applied toward a minor must be from courses outside a core department. All other university and college requirements apply.

Students pursuing this major may go to the Department of Mathematics for assignment to an adviser.

### Self-Designed Major

The Self-Designed Major (SDM) is an option for students who want a program of study that allows them to develop intellectual interests not now addressed by traditional majors and minors. The SDM encourages diversity and flexibility while requiring a clear academic focus and a unifying purpose. Most SDMs are interdepartmental and multidisciplinary.

**Program requirements.** Students are admitted to the program at least 3 semesters before their anticipated graduation. They must have a GPA of 3.0 and are expected to fulfill all university and college requirements. Students must maintain a minimum cumulative 3.0 GPA while in this program.

**Application for the Program.** Students first see an associate dean of the College of Arts and Sciences (109 A&S) who explains the program and helps with the application process. With the guidance of an appropriate

faculty member, students prepare a three- to five-page rationale for the SDM and a specific list of courses, including a minimum of 24 hours of formal course work and 6 hours of independent study to be used to prepare a senior paper or project. Sixteen of the 24 hours of the formal coursework must be in A&S departments or programs. Students also need a letter of support from a primary faculty adviser, as well as consent from two or more additional faculty, to serve on their supervisory committee.

**Senior Project.** Approximately two months before the end of the senior year, each student submits a project or paper which summarizes or typifies the SDM. The project is then evaluated by the supervisory committee. The supervisory committee makes a recommendation to the Associate Dean who recommends the student for graduation.

Students will receive the appropriate bachelor's degree with the major shown as Self Designed Major: \_\_\_\_\_ (name of focus).

### Earth System Science Interdisciplinary Degree Program

This intercollegiate, interdisciplinary Bachelor of Science program approaches the study of the Earth as a system, integrating the anthrosphere, atmosphere, biosphere, hydrosphere, and lithosphere to understand its complex interactions and prepare students to address issues of global environmental change.

In addition to ESS Core and Foundation courses in math, physics, chemistry, geographic information science, remote sensing, and biogeochemistry, students select a concentration in one of the participating departments. The current participating departments in the College of Arts and Sciences include anthropology, botany, geography, and geology/geophysics and the biology program. The college of the student's concentration department awards the degree. Students whose concentration is in one of the Arts and Sciences departments are also required to complete the A&S Core requirements.

For more information, go to [www.uwyo.edu/ESS](http://www.uwyo.edu/ESS) or see Dr. Robert D. Kelly ([rkelly@uwyo.edu](mailto:rkelly@uwyo.edu)) in the Engineering Building, room 6072, or contact the A&S participating departments.

## Microbiology Interdepartmental Program

The Bachelor of Science degree program in microbiology is an intercollegiate and interdisciplinary major with faculty and courses from the Colleges of Agriculture, Arts and Sciences, and Health Sciences. Students may obtain their degree in the College of Agriculture and Natural Resources.

For the major requirements, contact Program Director Ken Mills in the College of Agriculture and Natural Resources, 766-6638, kmills@uwyo.edu and the College of Agriculture and Natural Resources section on Microbiology in this *Catalog*.

## Concurrent Major in Environment and Natural Resources

A student majoring in any A&S department/program may earn a double major by completing the courses required for the Environment and Natural Resource (ENR) program in addition to the requirements in their A&S major and the College A&S Core. The School of ENR Web site, <http://www.uwyo.edu/enr> has detailed information, or contact the School at (307) 766-5080.

## Preprofessional Studies

The College of Arts and Sciences prepares students to enter professional schools through preprofessional programs of study described below.

**Prelaw Study.** Students usually need a bachelor's degree prior to beginning the study of law. There is no prescribed course of undergraduate study and no restrictions as to the field in which the degree is earned. However, to prepare for this competitive profession, prelaw students are advised to select courses that help to develop those talents and skills essential to the study and practice of law. Logical and critical thinking, conflict evaluation/resolution and effective verbal/nonverbal communication skills are essential. Additionally, students should understand the political, economic, social and cultural institutions and values that characterize human society. Rigorous courses in any discipline increase abilities in these areas. Regardless of the prelaw major, courses in the broad liberal arts--the sciences, social sciences, fine arts and humanities--increase understanding of the public's diverse interests and backgrounds.

Prelaw students do not have to declare a major at the time of first enrollment if they wish to explore options. Students who are undeclared in the College of Arts & Sciences

are assigned advisers in the UW Center for Advising and Career Services until they decide upon a degree program. Please note that a prelaw minor is available.

In addition to an adviser in the major, prelaw students may contact the designated UW prelaw adviser for assistance in developing a program of study, for career counseling and for guidance in applying to law schools. Contact Michell Anderson, A&S 152, 766-2641, manders2@uwyo.edu for information. A bulletin board for prelaw students is located in the south hallway, 1st floor of the A&S Building. Students are encouraged to use these resources.

Additional information and useful resources may be found on the pre-law Web site, [www.uwyo.edu/as/current-students/pre-law.html](http://www.uwyo.edu/as/current-students/pre-law.html). Detailed information about applying to law schools, the Law School Admissions Test (LSAT) and preparation materials, and links to other web sites are at [www.LSAC.org](http://www.LSAC.org).

The active pre-law club invites all prelaw students to join. For information, contact the prelaw club adviser, Michell Anderson at [manders2@uwyo.edu](mailto:manders2@uwyo.edu).

**Library Preprofessional Study.** Librarians are information professionals who research, organize, and classify materials so the public can access information. Not only do they work with printed materials, but all the technological advances in digital media such as electronic databases and eBooks. Some librarians focus on teaching the public, scholars, and students how to access and use these materials, while others concentrate on collecting and maintaining these diverse resources. Librarianship offers many career opportunities to people of different academic backgrounds, interests, and talents. Most public, academic, and special libraries require a Master's degree in library science (MLS).

The degree programs and minors in the College of Arts and Sciences offer the variety of academic preparation expected by accredited library schools in the country. Most of the graduate schools in library science require a bachelor's degree, a good undergraduate record, and a reading knowledge of a foreign language for admission. The best undergraduate preparation includes a wide range of courses in the sciences, social sciences, and humanities along with a strong concentration in one subject area. The choice of a major will be determined by the student's academic interest and professional objective. The general education that the University Studies and the

A&S Core require provide the well-rounded background graduate schools expect of their MLS candidates.

Additional information about library schools, their requirements, and programs as well as career opportunities may be obtained from the reference desk at Coe Library and the Center for Advising and Career Services. The U.S. Bureau of Labor Statistics "Occupational Outlook Handbook" at [www.bls.gov/oco/home.htm](http://www.bls.gov/oco/home.htm) has detailed descriptions of the varied work of librarians, working conditions, employment outlook, and sources for additional information.

**Premedical, Predental and Preoptometry Study.** Students with the most promise and the best undergraduate preparation have the competitive advantage in being admitted to these professional programs. These schools are favorably impressed by a broad educational background, including a substantial number of both non-science and science courses; therefore, students are well advised to look beyond the minimum requirements.

Students may select any major in which they are interested. In addition to completing all university, college and departmental requirements, students must include in their curriculum the basic professional school requirements such as courses in biology, chemistry, math, and physics. Professional schools have other specific requirements and students should learn about any additional recommendations from those professional schools in which they are interested. For assistance, contact the preprofessional adviser in the College of Health Sciences, 110 & 112 Health Sciences Center, (307) 766-6704 or 766-3499, or [preprof.hs@uwyo.edu](mailto:preprof.hs@uwyo.edu).

Common majors in the College of A & S for these preprofessional programs include chemistry, biology, botany, psychology, physiology, and zoology. However, there are preprofessional students in programs as diverse as theatre and dance and anthropology. Students need not declare a major immediately upon first enrollment. Advisers in individual departments can discuss options or if students wish to remain undeclared, they are advised in the UW Center for Advising and Career Services.

Preprofessional assistance is available in the Departments of Chemistry, Physics, Psychology, and Zoology/physiology. The preprofessional advisers in the College of Health Sciences have current information regarding professional school admission requirements, entrance examinations, programs in Western Interstate Commission on Higher Education

(WICHE), Wyoming Medical Contract Program WWAMI (affiliated with the University of Washington School of Medicine) and financial assistance for professional education. The honor society for students enrolled in preprofessional studies, Alpha Epsilon Delta, is also administered in the College of Health Sciences. The Web site, <http://www.uwyo.edu/preprof/> includes additional information.

## Internships

Many departments in the College of Arts and Sciences offer internships for academic credit, and some provide monetary compensation. Academic internships provide practical, hands-on experience in a professional job setting as a complement to classroom instruction. An internship can provide students with both insight and preparation for future jobs. All internships require a strong background in writing, organizational ability and analytic skills. Junior or senior standing is recommended.

## Special Courses (AS)

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).**

**1000. Intellectual Community of Undeclared Students, Building Connections and Community. 2. [I,L♦(none)]** Introduction to the intellectual community of the University of Wyoming, information literacy, and higher education in general, and is specifically intended for students who have not yet made a decision about their college major. Students will begin to develop the critical thinking skills that are necessary in higher education and to explore the primary intellectual activities of various disciplines. (Offered fall semester)

**1100. Academic and Career Orientation. 1.** Provides students with opportunity to explore areas of study available within the colleges of the university and to evaluate their own abilities, interests and skills relative to career choice. Emphasis is placed upon study skills, self-awareness, exploration of the work world and preparation for entry into a given career. (Normally offered both semesters)

**1110. Introduction to Academic Writing Skills. 3.** Designed to introduce non-native speakers of English, who do not demonstrate the required competency in writing to enter AS 1210, to academic writing skills. Includes instruction in grammar and sentence structure, paragraph and essay writing. *Prerequisites:* TOEFL of 18 and lower; IELTS of 5 and lower.

**1210 [ENGL 1210]. English Composition for International Students. 3. [WA♦(none)]** Accommodates students of different cultures

and different levels of English proficiency. The course's objective is to equip students with procedural knowledge – a set of routines that can be applied in various academic writing patterns, such as description, process analysis, argumentation and the research essay. *Prerequisite:* AS 1000.

**2000 [ENGL 2110]. Study Abroad. 1-18 (Max. 18).** Students may register through the University of Wyoming for up to two semesters of academic work abroad with the approval of the academic adviser, head of the major department and coordinator of the Study Abroad Program.

**2110. English Oral Skills. 3.** Instruction for Novice to advanced Low speakers in refining English pronunciation, stress and intonation, listening comprehension, oral grammar practice and building vocabulary. Satisfactory/Unsatisfactory only. *Prerequisite:* consent of instructor.

**2200. British Life and Culture. 3. [G♦(none)]** A study of contemporary British institutions and significant aspects of the culture, with a focus on London. Offered for S/U only. *Prerequisite:* participation in London semester.

**2400. Lower-Division Internship in \_\_\_\_\_. 1-12 (Max. 12).** Allows students to gain hands-on experience that will help to bridge the gap between the theory of academia and the practicality of the work world. Specific arrangements must be made in advance to identify the academic component of the internship and the grading criteria. Planning will involve the internship agency, the student's academic adviser and the associate dean of the college. *Prerequisites:* sophomore standing and the approval of the adviser, head of the major department and an associate dean of A&S. (Offered both semesters)

**2490. Special Topics in \_\_\_\_\_. 1-3 (Max. 6).** Courses of broad general appeal and an inter-departmental flavor will be offered from time to time under this title. Permits utilization of unusual faculty expertise and provides highly-specialized and particularly pertinent, timely subject matter. See current class schedule for topics. *Prerequisite:* sophomore standing.

**3100. Career Preparation and Transition. 1.** Designed to help students in the College of Arts & Sciences better prepare for and achieve success in career planning and job searching. Primary purpose is to help identify possible careers and to prepare for the transition from college to career. *Prerequisites:* junior class standing and completion of WA.

**4280. Chaos, Fractals and Complexity. 3.** Designed especially for non-science majors. Explores how new sciences of fractals, chaos

and complexity are changing ways in which we describe, predict and understand nature and art. Topics include population models, world economy, weather, biological systems, evolution and aesthetic appreciation of art and music. *Prerequisites:* USP Math QA and QB.

**4400. Upper-Division Internship in \_\_\_\_\_. 1-12 (Max. 12).** Permits students to contribute in the areas of their expertise and gain hands-on experience that will help to bridge the gap between academia and the real world of work. Specific arrangements must be made in advance to identify the academic component of the internship and the grading criteria. Such planning will involve the internship agency, the student's academic adviser and the associate dean of the college. *Prerequisites:* approval of adviser, head of the major department and an associate dean of A&S. (Offered both semesters)

**4500. Washington Center Internship. 1-12 (Max. 12).** Affiliated with the Washington Center, a private, nonprofit, educational organization which provides comprehensive learning opportunities in the nation's capitol for both undergraduate and graduate students. Includes placement (in congressional offices, executive agencies, judicial institutions, public and special interest groups and community programs), supervision, evaluation, orientation, housing, seminars, counseling, a lecture and debate series, special events and other support services. See associate dean, College of Arts and Sciences, for details, but plan on a six-month lead time. *Prerequisite:* junior standing. (Offered both semesters)

**4510. Washington Center Seminar. 3-6 (Max. 6).** Taken in conjunction with the Washington Center internship program (A&S 4500). Extension of internship experience via discussion-sized groups, led by faculty who are practitioners functioning in the same contexts of action as the internship. *Prerequisite:* junior standing. (Offered both semesters)

**4900. Special Topics in \_\_\_\_\_. 1-3 (Max. 6).** Courses of broad general appeal and an inter-departmental flavor will be offered from time to time under this title. Permits utilization of unusual faculty expertise and provides highly-specialized and particularly pertinent, timely subject matter. See current class schedule for topics. *Prerequisite:* junior standing. (Offered based on sufficient demand and resources)

**4975. Independent Study. 1-3 (Max. 6).** Offers the advanced student the opportunity to pursue an individualized topic of interest with the assistance and direction of an instructor. *Prerequisites:* junior/senior standing and consent of instructor.

## African American and Diaspora Studies

111 Ross Hall, 766-2481

Director: Tracey Owens Patton

Web site: www.uwyo.edu/AADS

### Professor:

**JACQUELYN BRIDGEMAN**, B.A. Stanford University 1996; J.D. University of Chicago 1999; Professor of Law 2008, 2002.  
**TRACEY OWENS PATTON**, B.A. Colorado State University 1993; M.A. 1996; Ph.D. University of Utah 2000; Professor of Communication and Journalism 2012, 2003.

### Associate Professor:

**DEBORAH L. MCGRIFF**, B.S. University of Nebraska-Lincoln 1976; M.S.W. University of Nebraska-Omaha 1981; Ph.D. University of Wyoming 1999; Associate Professor of Counselor Education 2008, 2002.  
**CHERYL WELLS**, B.A.H. Queens University 1995; M.A. University of South Carolina 1997; Ph.D. 2002. Associate Professor of African American and Diaspora Studies 2014.

### Assistant Professors:

**ULRICH ADEL**, M.A. University of Hamburg, Germany 2000; Ph.D. University of Iowa 2007; Assistant Professor of African American and Diaspora Studies and American Studies 2009.

**ERIN FORBES**, B.A. Reed College 2002; Ph.D. Princeton University 2009; Assistant Professor of English 2009.

**KERRY PIMBLOTT**, B.A. Kings College London 2005; Ph.D. University of Illinois at Urbana Champaign 2012; Assistant Professor of African American and Diaspora Studies and History 2014.

**MARCUS WATSON**, B.S. SUNY Brockport 1995; M.A. Cornell University 2005; Ph.D. 2009; Assistant Professor of Global and Area Studies 2010.

### Assistant Academic Professional

#### Lecturer:

**MARY L. KELLER**, B.A. Williams College 1987; M.A. Syracuse University 1992; Ph.D. 2002.

#### Lecturers:

**LUCAS STRICKER**, B.A. University of Wyoming 2005; M.F.A. 2007.

The African American and Diaspora Studies Program, through an interdisciplinary course of study, examines the experiences of African Ameri-

cans in the Western United States, in the context of Africa and its Diaspora in Europe and the Americas.

## African American and Diaspora Studies Minor

African American and Diaspora Studies offers a self-designed undergraduate major or undergraduate minor. The minor in African American and Diaspora Studies requires 21 credit hours; this includes the three-credit hour independent research. Three of those courses or (9) credit hours must include the required core courses, and the remaining courses must be at the 2000 level or higher.

The thematic tracks are recommended as a structural guide, not a requirement, to help students focus their coursework with their major.

### Minor Required Courses

AAST 1000.....	3
AAST/HIST 2360.....	3
AAST 3130.....	3

### Capstone Courses

AAST 4975.....	3
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### Thematic Tracks

#### History

AAST/HIST 2360.....	3
AAST 3100.....	3
AAST 3110.....	3

#### Culture & Aesthetics

AAST 2410.....	3
AAST 2730.....	3
AAST 3000.....	3
AAST 3010.....	3
AAST 3670.....	3
AAST 4020.....	3

#### Politics & Law

AAST 4000.....	3
AAST 4400.....	3
AAST 4990.....	3

#### Rhetoric & English

AAST 2350.....	3
AAST 4160.....	3
AAST 4200.....	3
ENGL 4450.....	3

#### Religion & Philosophy

AAST 2450.....	3
AAST 4100.....	3

#### Media Studies

AAST 4990.....	3
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#### Additional Courses

AAST 1030.....	3
AAST 4970.....	1-12
AAST 4990.....	3

At present, no program for graduate degrees in African American and Diaspora Studies is offered; however, some courses may be counted at the graduate level.

## African American and Diaspora Studies (AAST)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

**1000. Introduction to African American Studies. 3. [D◀▶(none)]** Surveys African presence in America. Selected teachings are designed to give the student a concise understanding of the heritage of African people in America.

**1030. Social Justice in the 21st Century. 3. [I,D◀▶(none)]** Appropriate for students interested in diversity and social justice. Topics covered through an interdisciplinary study of people and society range from identity, critical thinking, empowerment, role models, stereotyping, institutional discrimination, and tolerance. The key lynchpin is active participation in the development and maintenance of just communities. Cross listed with AIST/AMST/WMST/CHST 1030. Enrollment preference will be given to We The People FIG students.

**1101. First-Year Seminar. 3. [(none)◀▶FYS]**  
**2240. Introduction to African Studies. 3. [WB◀▶COM2]** Confront African stereotypes by exploring the continent's complex history and current affairs. These realities will be reached with the help of different disciplinary perspectives, such as economics, political science, and anthropology. Equipped with the basics, students will be primed to tackle more advanced courses on Africa. Cross listed with INST 2240. *Prerequisites:* WA or equivalent.

**2350. African American Literature. 3. [WB,D◀▶(none)]** Encompasses poetry, fiction, drama and autobiography from the Harlem Renaissance and earlier to present. Cross listed with ENGL 2350. *Prerequisite:* WA.

**2360. African American History. 3. [CH,D◀▶COM2]** Surveys African-American history in America, particularly emphasizing issues of identity, class, and progress as well as exploring African-Americans' quest for full participation in American life. Cross listed with HIST 2360.

**2410. Survey of Afro-Caribbean Cultures. 3.** Examines the diverse cultural dimensions of the Caribbean (e.g., music, language, religion, politics, and lifestyles) in relation to its historical retentions in West Africa. Critical study of pre and post colonialism and its affects on contemporary Caribbean society is a

major emphasis. These critical paradigms also include the study of Afro-Caribbean populations in America.

**2450. Traditional African Religion. 3. [CH,G◀COM2]** Surveys traditional religions of Africa, both ancient and contemporary. Cross listed with RELI 2450.

**2730. African Creativity and Ritual. 3. [CA,G◀(none)]** In a thematic organization, explores both North African and sub-Saharan cultures, incorporating issues pertinent to art history, African American studies, religious studies and women's studies. Looks at music, dance, body language, festival, celebration, coming of age rituals, fertility rites, harvest and funerals. Cross listed with ART/ANTH 2730.

**3000. African American Studies in Music. 3. [(none)◀H]** Surveys African American music from its origins in Africa to current, popular jazz, rock, soul and rap forms. *Prerequisite:* AAST 1000 or any AAST 2000-level course.

**3010. The African American Aesthetic. 3.** Examines interrelationship of the creative process with cultural and philosophical motifs, as well as the spiritual and the artistic amongst African people on the continent and Diaspora. *Prerequisite:* AAST 1000 or any AAST 2000-level course.

**3100. The African American Experience before 1865. 3.** Lecture, discussion, and writing on the experience of African Americans in the United States. Begins with the northern migration of Afro-Mexicans, in the 17<sup>th</sup> Century, CE; ends with the Civil War and the emancipation of the slaves. *Prerequisite:* AAST 1000 or 3 hours in history; and WA.

**3110. The African American Experience After 1865. 3.** Experience of African Americans in the United States. Begins with emancipation of slaves and traces the evolution of "black" culture and identity; construction and destruction of racial segregation, the continuing struggle for freedom. *Prerequisite:* AAST 1000 or 3 hours in history.

**3130. Global Impact of African Cultures. 3.** Examines concepts of culture and value systems as applied to Africa and African-derived cultures and the impact on civilizations around the globe. Using the lens of the Diaspora, this course examines aspects of African culture on the African continent along with the traditions, experiences, socialization, and histories that continue for dispersed peoples of African descent. *Prerequisite:* AAST 1000 or any AAST 2000-level course.

**3260. African Spirits in the New World. 3. [CH,G◀(none)]** Begins with Yoruba roots in Africa travels with the African Diaspora

focusing on spirit possession in Haitian Vodou, Cuban Santeria, Jamaican Revival Zion, Jamaican Rastafarianism, Brazilian Candomblé, and "Black Church" in the United States using ethnography and postcolonial theory of religious studies. Cross listed with RELI 3260. *Prerequisites:* AAST 1000 or any AAST 2000 level course or RELI 1000.

**3670. African Diaspora. 3. [CS,G◀(none)]** Examines process through which aspects of African culture have endured in Diaspora. Analyzes social relations between Diaspora Africans and non-African populations in N. and S. America, the Caribbean, Britain, Asia and the Mediterranean. Discusses cultural hybridization as a product of culture contact. Cross listed with HIST 3670. *Prerequisite:* AAST 1000, any AAST 2000-level course, or AAST/HIST 2360.

**4000. Black Freedom Movement, 1955-Present. 3. [CH,D◀(none)]** Presents the struggle of African Americans for self-definition, self-development, and self-determination from the inception of the modern civil rights movements to the contemporary period. *Prerequisite:* 3 hours of AAST courses.

**4020. The Black West. 3. [CH,D◀(none)]** This course explores the historical experiences and contributions of people of African descent to the American West from their earliest recorded presence in the 16<sup>th</sup> Century through the present. Cross listed with HIST 4020. *Prerequisites:* AAST 1000, any AAST 2000-level course, junior/senior standing, or three hours of any level of HIST course.

**4050. Development, Africa, and Culture. 3.** Focuses on the complex and checkered relationships between Western-inspired development and African cultures. Striking a balance among ethnographic case studies, theoretical lenses, and practical implications, understand what Euro-American efforts at foreign development, including contemporary globalization, look like from an African perspective. Provides an understanding of African expectations of development and developers. Dual listed with AAST 5050; cross listed with INST 4050. *Prerequisites:* junior standing and instructor consultation.

**4060. NGOs, Development, and Culture. 3.** Non-governmental organizations (NGOs) have grown exponentially in number and are often viewed as the new and best vehicle for international development. Focuses on international non-governmental organizations (INGOs), in contexts of Western aid to post-colonial societies and the role they play in the international aid system. Understand INGOs from historical, global, and cultural perspec-

tives. Dual listed with AAST 5060; cross listed with INST 4060. *Prerequisites:* junior standing and instructor consultation.

**4100. African American Religious Culture. 3. [WC,D◀(none)]** Mid-level writing-intensive seminar. Comparative study of African American religious celebration, primarily in the context of Afro-Christianity, but touching on Islam, Candomble, "Voodoo," Santeria, and Rastafarianism. Cross listed with RELI 4100. *Prerequisite:* WB and one of the following: AAST 1000 or any AAST 2000-level course or RELI 1000.

**4160. African American Rhetoric. 3. [CH,D◀COM3]** African American discourse and its relationship to equality and participation. Through examination of various media, music, speeches, and art this course uses the struggle of African Americans as an instructive exemplar, to come to terms with the philosophical concepts, political issues, moral complexities, and discursive characteristics of African American Rhetoric. Dual listed with AAST 5160; cross listed with COJO 4160. *Prerequisites:* AAST 1000, any AAST 2000-level course, junior or senior standing, or nine credit hours in any level COJO course.

**4190. Dimensions of Racism. 3.** Explores the effects of racism on African people in America using an African centered framework. We will look at the ways racism intersects with sexism, classism, and heterosexism/homophobia within the African community both in America and throughout the Diaspora. Dual listed with AAST 5190; cross listed with COJO 4190. *Prerequisites:* AAST 1000, any AAST 2000-level course, junior or senior standing, or nine credit hours in any level COJO course.

**4233. Race, Gender, Ethnicity in the Media. 3. [WC,D◀COM3]** Examine the role mass media plays in the Black community and other racial, ethnic, gendered, and socioeconomic communities. Students will develop a critical understanding of the way the mass media uses stereotypes and prejudice to influence society's views about ethnic minorities and women in contemporary United States society. Cross-listed with COJO 4233 and WMST 4233; dual-listed with AAST 5233. *Prerequisites:* AAST 1000, any AAST 2000-level course, or three hours of any level of WMST courses, or three hours of any level COJO courses; WB, and junior/senior standing.

**4250 [4200]. The Harlem Renaissance. 3. [D◀(none)]** Examines the florescence of African American creativity, centered in Harlem, New York, between the end of World War I and the onset of the Great Depression. This movement had a tremendous impact on African American culture in and outside of

the U.S., including Africa and the Caribbean. Dual listed with AMST 5250; cross listed with AMST 4200. *Prerequisites:* AAST 1000, AMST 2010, AMST 2110, any AAST 2000-level course, junior or senior standing, or nine credit hours in any level AMST course.

**4260. [4985] Rhetoric and Social Justice. 3. [D◀COM3]**

Analyzes concepts of ableism, anti-Semitism, heterosexism, racism, sexism, and socioeconomic class through a critical/social construction framework. It attempts to develop a “working” definition of these concepts by analyzing historical and current conceptualizations and identifying marginalization and disenfranchisement as it is woven in the fabric of American society. Dual listed with AAST 5260; cross listed with COJO 4260. *Prerequisites:* Minimum of 9 credit hours in AAST or COJO and junior standing. (Offered spring semester of even-numbered years)

**4400. Black Politics, 1867 to the Present. 3.**

African American participation in partisan electoral politics in the United States from Reconstruction to the current presidential election. Cross listed with POLS 4400. *Prerequisites:* AAST 1000, any AAST 2000-level course, or POLS 1000 and junior/senior standing.

**4450. African American Novel. 3.** Considers aesthetic dimension and cultural matrix of novels written by Black Americans. Cross list with ENGL 4450. *Prerequisites:* AAST 1000, any AAST 2000 level course, junior/senior standing, six hours of 2000-level literature courses in ENGL.

**4455. Literature of Enslavement. 3-4 (Max. 4). [D◀(none)]**

Students engage in an in-depth study of the literary voices that emerged from the history of enslavement in the Americas from colonial times through the end of Reconstruction in 1877. Dual listed with AAST 5455; cross listed with ENGL 4455. *Prerequisites:* AAST 1000, any AAST 2000-level course, and junior/senior standing, or six credit hours of literature courses in ENGL.

**4675. U.S. Women of Color. 3. [D◀(none)]**

Examines in comparative perspective the social conditions that shape the experiences of Chicanas/Latinas in the U.S. Students gain an understanding of how the intersection of race, class, gender, and sexuality shape the lived experiences of U.S. women of color through ideological, economic, and political forces. Cross listed with CHST/WMST 4675. *Prerequisite:* junior standing and/or a combination of 3-6 hours of any level of CHST, WMST, or AAST coursework.

**4970. Internship in AAST. 1-12.** Designed for students to utilize the knowledge and skills obtained in their program of study to be applied at an organization or institution. Students will provide a job description, sign an internship contract, keep daily work journals, provide work samples, submit a paper, and include a final evaluation by their Internship supervisor. *Prerequisite:* 9 hours in AAST courses.

**4975. Independent Research. 1-3 (Max. 6).** Independent study in African American Studies. *Prerequisites:* AAST 1000 and consent of instructor.

**4990. Topics:\_\_\_\_\_ . 3 (Max. 12).** In-depth study of a topic not offered as regular course. *Prerequisite:* AAST 1000.

**5050. Development, Africa, and Culture. 3.**

Focuses on the complex and checkered relationships between Western-inspired development and African cultures. Striking a balance among ethnographic case studies, theoretical lenses, and practical implications, understand what Euro-American efforts at foreign development, including contemporary globalization, look like from an African perspective. Provides an understanding of African expectations of development and developers. Dual listed with AAST 4050; cross listed with INST 5050. *Prerequisites:* junior standing and instructor consultation.

**5060. NGOs, Development, and Culture. 3.**

Non-governmental organizations (NGOs) have grown exponentially in number and are often viewed as the new and best vehicle for international development. Focuses on international non-governmental organizations (INGOs), in contexts of Western aid to post-colonial societies and the role they play in the international aid system. Understand INGOs from historical, global, and cultural perspectives. Dual listed with AAST 4060; cross listed with INST 5060. *Prerequisites:* junior standing and instructor consultation.

**5160. African American Rhetoric. 3.** African American discourse and its relationship to equality and participation. Through examination of various media, music, speeches, and art this course uses the struggle of African Americans as an instructive exemplar, to come to terms with the philosophical concepts, political issues, moral complexities, and discursive characteristics of African American Rhetoric. Dual listed with AAST 4160; cross listed with COJO 5160. *Prerequisite:* AAST 1000, any AAST 2000-level course, junior or senior standing, or nine credit hours in any level COJO course.

**5190. Dimensions of Racism. 3.** Explores the effects of racism on African people in America using an African centered framework. We will

look at the ways racism intersects with sexism, classism, and heterosexism/homophobia within the African community both in America and throughout the Diaspora. Dual listed with AAST 4190; cross listed with COJO 5190. *Prerequisites:* AAST 1000, any AAST 2000-level course, junior or senior standing, or nine credit hours in any level COJO course.

**5250. The Harlem Renaissance. 3.** Examines the florescence of African American creativity, centered in Harlem, New York, between the end of World War I and the onset of the Great Depression. This movement had a tremendous impact on African American culture in and outside of the U.S., including Africa and the Caribbean. Dual listed with AMST 4250; cross listed with AMST 4200. *Prerequisites:* AAST 1000, AMST 2010, AMST 2110, any AAST 2000-level course, junior or senior standing, or nine credit hours in any level AMST course.

**5233. Race, Gender, Ethnicity in the Media. 3.** Examine the role mass media plays in the Black community and other racial, ethnic, gendered, and socioeconomic communities. Students will develop a critical understanding of the way the mass media uses stereotypes and prejudice to influence society’s views about ethnic minorities and women in contemporary United States society. Cross-listed with COJO 5233 and WMST 5233; dual-listed with AAST 4233. *Prerequisites:* AAST 1000, any AAST 2000-level course, or three hours of any level of WMST courses, or three hours of any level COJO courses; WB, and junior/senior standing.

**5260. [5985] Rhetoric and Social Justice. 3.** Analyzes concepts of ableism, anti-Semitism, heterosexism, racism, sexism, and socioeconomic class through a critical/social construction framework. It attempts to develop a “working” definition of these concepts by analyzing historical and current conceptualizations and identifying marginalization and disenfranchisement as it is woven in the fabric of American society. Dual listed with AAST 4260; cross listed with COJO 5260. *Prerequisites:* graduate standing. (Offered spring semester of even-numbered years)

**5455. Literature of Enslavement. 3-4 (Max. 4).** Students engage in an in-depth study of the literary voices that emerged from the history of enslavement in the Americas from colonial times through the end of Reconstruction in 1877. Dual listed with AAST 4455; cross listed with ENGL 5455. *Prerequisites:* AAST 1000, any AAST 2000-level course, and junior/senior standing, or six credit hours of literature courses in ENGL.

**5560. Black Popular Culture. 3.** Approaches African American popular culture from theoretical perspectives which include black feminist, postcolonial, and poststructuralist analyses. Cross listed with AMST 5560. *Prerequisites:* graduate standing; instructor consent for undergraduate students.

## American Indian Studies

115 Ross Hall, 766-6521

**Web site:** [www.uwyo.edu/aist](http://www.uwyo.edu/aist)

**Director:** Christopher Caskey Russell

### Adjunct Faculty:

(See Catalog section following name for academic credentials.)

**William Gribb**, geography

**Michael Harkin**, anthropology

**Pamela Innes**, anthropology

**Angela Jaime**, educational studies

**Jeffrey Means**, history

**Christopher Caskey Russell**, English

### Emeriti Faculty:

Judith A. Antell

The American Indian Studies Program offers an academic major at the undergraduate level and a minor at both the undergraduate and graduate level. This interdepartmental course of study examines Native North American cultural and social life, including economic, political, and educational systems. Historical and contemporary perspectives of American Indian experiences are included in this program.

Students may choose an American Indian studies minor to complement a major field of study. Related disciplines include American studies, anthropology, art, ethnic studies, geography, history, law, music, philosophy, political science, and sociology. A minor in American Indian studies provides excellent preparation for teachers, researchers, social workers, health care providers, resource managers, economic developers, and legal practitioners.

### AIST Undergraduate Minor

Students graduating with an undergraduate minor degree in American Indian studies will be able to: 1) Explain the concept of tribal sovereignty and how tribal sovereignty is both restricted and acknowledged by the federal trust relationship and by relationships with states; 2) Understand the development of modern tribal governments and their functions and importance in contemporary society; 3)

Understand and appreciate the roles of history, culture, and politics in the development of tribal world views, world views that relate to modern life and contemporary issues of concern for Native American peoples; 4) Identify historical, cultural, and political diversity and significance in Native oral traditions and written literatures; 5) Recognize stereotypes about Native American peoples and explain why these stereotypes were created and why they are sustained in modern society, and; 6) Understand from the perspective of American Indian peoples, historical experiences and contemporary issues in North America.

### AIST Undergraduate Major

In addition to the skills acquired by students who earn an undergraduate minor degree in American Indian studies, students working toward a B.A. in American Indian Studies will study tribal governance, literature, history, environment and natural resource management, ways of knowing, and indigenous languages. Inherent in this degree's curriculum and related activities is the expectation that students and faculty will assume an active role in working with and for Indigenous communities. AIST requires it majors to earn a grade of C or better in all courses taken to fulfill the major.

### AIST Graduate Minor

A graduate minor in American Indian studies is comprised of 12 hours with at least 6 hours at the 5000 level. It is expected that each graduate minor student and his/her graduate committee, at least one member of whom will be from American Indian studies, will determine the specific courses to be taken. It is recommended that one of the four classes selected be a 3 credit AIST 5000 Independent Study. This class will provide a research experience in the discipline of American Indian studies that may support a master's thesis or doctoral dissertation. The research expectation in AIST can be satisfied by the 3 credit hour Independent Study and/or by the thesis or doctoral dissertation.

Students graduating with a graduate minor degree in American Indian studies will be able to: 1) Make apparent in masters'-level research the interdisciplinary connections between American Indian studies and the primary field of graduate study; 2) Integrate American Indian studies research methods with the research methods used in the primary field of graduate study; and 3) Demonstrate in writing the ability to understand a variety of subjects from a tribal perspective.

## Teaching Certification

Through the Outreach School, a Teachers of American Indian Children (TAIC) Endorsement / Graduate Certificate can be earned. This non-degree graduate program certifies that those who complete its five specialized courses possess the attitudes, knowledge, and competence necessary to effectively teach American Indian Children. Upon completion, students receive official recognition of their achievement on their transcripts and an official certificate. Visit the Outreach Credit Program Website <http://outreach.uwyo.edu/ocp/> for more information. All courses are cross-listed with AIST.

An interdepartmental American Indian Studies Advisory Committee guides the program's development. The director advises students selecting the American Indian studies major or minor.

Complete information about the American Indian studies undergraduate major, undergraduate minor, and graduate minor is available in the American Indian Studies Program office and on the program Website.

## American Indian Studies (AIST)

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB↔Q]).**

**1001. Foundations in American Indian Studies. 3. [CS,D↔(none)]** Explains the development of American Indian studies and will show how a variety of disciplines continue to inform this field and interact to facilitate the exploration of its major topics of concern, including Native histories, cultures, and contemporary lives.

**1010. Beginning Indigenous Language. 4.** Fundamentals of grammar, conversation, composition, and reading. Satisfactory/unsatisfactory only.

**1030. Social Justice in the 21st Century. 3. [I,D↔(none)]** Appropriate for students interested in diversity and social justice. Topics covered through an interdisciplinary study of people and society range from identity, critical thinking, empowerment, role models, stereotyping, institutional discrimination, and tolerance. The key lynchpin is active participation in the development and maintenance of just communities. Cross listed with AAST/AMST/WMST/CHST 1030. Enrollment preference will be given to "We The People" FIG students.



**1350. American Indians in Contemporary Society. 3. [CS,D♦(none)]** Examines social and cultural issues and concerns of American Indians both on and off the reservations. Additionally, the status of American Indian people within the dominant society and culture will be explored. Cross listed with SOC 1350.

**2010. Intermediate Indigenous Language. 4.** Second level fundamentals of grammar, conversation, composition, and reading. Satisfactory/unsatisfactory only. *Prerequisites:* AIST 1010.

**2060. Topics. 1-4 (Max. 6).** Popular and current topics in American Indian studies.

**2210. North American Indians. 3. [CS, D♦(none)]** Comparative consideration of North American Indian culture areas at European contact period. Cross listed with ANTH 2210.

**2290. History of North American Indians. 3. [CH,D♦(none)]** Studies American Indian history through 500 years and across the continent. Considers Indian political, social, and economic continuity and change. Focuses on how Indian peoples experienced and responded to times of dramatic change. Cross listed with HIST 2290.

**2340. Native American Culture and Literature. 3. [CH,D♦(none)]** Broad cultural study of Native Americans, past and present. Emphasizes folklore and literature. Cross listed with ENGL 2340. *Prerequisite:* WA course.

**2345. American Indians in Hollywood Film. 3. [CH,D♦(none)]** Examines the ways Hollywood films have constructed various forms of racial identity for American Indians. Cross listed with ENGL 2345. *Prerequisite:* WA.

**3000. Plains Culture and History. 3. [D♦(none)]** An ethnohistorical study of those Native peoples inhabiting the Plains region of the U.S. from prehistory to the present. Cross listed with HIST 3000. *Prerequisite:* 3 hours of AIST courses.

**3010. Proficient Indigenous Language. 4.** Emphasizes the development of listening, speaking, reading, and writing so as to help students function effectively in the tribal cultural context of which the language is a part. Satisfactory/unsatisfactory only. *Prerequisite:* AIST 2010.

**3100. Tribal Literatures of the Great Plains. 3. [WC,D♦(none)]** Familiarizes students with American Indian literatures of the Great Plains. The Great Plains region is the locus of much historical and contemporary significance in regard to American Indian cultures. The literature of Great Plains Indians allows students to confront and reexamine the national

narratives surrounding American Indians. Cross listed with ENGL 3100. *Prerequisite:* 6 hours of AIST or ENGL.

**3200. Indigenous Peoples and the Environment. 3.** Understand the historical, political, and socio-economic forces that have shaped the relationships of Indigenous peoples to their environments, and be able to discern the similarities and dissimilarities of Indigenous issues across international borders. The course may include a study abroad component. *Prerequisites:* 6 hours AIST credit.

**3300. Federal Indian Law. 3.** Survey of law that applies to individual Indians and tribal governments. In particular, explores the legal relationships among, and relative jurisdictions of federal, tribal, and state governments. Specific topics include civil and criminal jurisdiction, taxation, family law, hunting and fishing, and gaming regulations. *Prerequisite:* AIST 1001 or 1350.

**3400. Traditional Ecological Knowledge. 3. [CS,D♦(none)]** Description of the interaction between economy, religion, language and the ecosystem for select Indigenous peoples and discussion of the pedagogical methods for preserving their ecological knowledge. An examination of the conflict between contemporary society's demands and preserving traditional society's heritage. Cross listed with GEOG 3400. *Prerequisite:* one course in American Indian culture.

**4000. Indians of Wyoming. 3. [D♦(none)]** Examines Native American culture in Wyoming from pre-history to the 21st century. Analyzes social, political, and economic developments of Native peoples of Wyoming before, during, and after contact with Europeans. Discusses interaction between these diverse societies and explores the changing relationships between Indians and Euro-Americans through the periods after contact. Cross listed with HIST 4000. *Prerequisite:* 6 hours of HIST or 6 hours of AIST.

**4010. Advanced Indigenous Language. 4.** Stresses the usage of language through composition, conversation, oral presentation, and grammar review. Satisfactory/unsatisfactory only. *Prerequisites:* AIST 3010.

**4020. Internship. 1-12 (Max. 12).** Requires active participation and service to an Indigenous community or organization in US or elsewhere. A written agreement among the student, the AIST director or AIST faculty mentor, and an on-site supervisor is required. AIST Majors must take at least four credit hours. *Prerequisite:* 9 hours of AIST courses.

**4100. Tribal Government. 3.** Examines traditional systems of tribal governance; the establishment of contemporary tribal govern-

ments; stakeholders and their goals; factors influencing tribal government operations, including the federal trust relationship, plenary power, tribal federal and tribal-state relations; powers of tribal governments; and the future of tribal governments. *Prerequisite:* 6 hours of AIST courses, including AIST 1001, and/or AIST 1350.

**4110. Educational Foundations in American Indian Education. 3. [D♦(none)]** Examines cultural, geographical, linguistic, spiritual, political, and societal factors before, during, and after colonization of the Americas. Definitions and day-to-day realities of terms like ethnocentrism, cultural relativism, assimilation, acculturation, and institutional racism. Development of insights into positive teacher-pupil-community relationships that honor culture and language differences and enhance achievement. Dual listed with AIST 5110; cross listed with EDCI 4110. *Prerequisite:* AIST 1001 and 15 credit hours of AIST or EDST.

**4200. Indigenous Communities Abroad: International Travel. 4.** Devoted to study/travel related to Indigenous peoples abroad. The specific topic will be determined each time the class is offered. Two weeks of international travel will follow sixteen hours of on-campus instruction. *Prerequisites:* 6 credits in AIST.

**4340. Natural Resource Management on Western Reservations. 3.** Examines natural resource management techniques on western reservations. Focus is on the management and planning of water, grazing, extractive industries, and forestry. Fieldwork on the Wind River Indian Reservation is included. Cross listed with GEOG 4340. *Prerequisite:* 6 hours of 2000-level AIST courses.

**4360. American Indian Women. 3.** Explores the lives of American Indian women in a variety of contexts through time. Complexity and diversity of Indian women's experiences throughout history are emphasized. Concerns Indian women's lives within the reality of European American colonization and its consequences for Indian peoples. Dual listed with AIST 5360; cross listed with WMST/SOC 4360. *Prerequisite:* 6 hours of 2000-level AIST courses.

**4460. American Indian Literature. 3. [WC♦(none)]** Advanced critical study of the history of American Indian literature, emphasizing the authors' views of social change. Cross listed with ENGL 4460. *Prerequisite:* 6 hours of 2000-level literature courses.

**4462. American Indian History to 1783. 3.** Surveys the history of American Indians from the period before contact to the end of the American Revolution. Examines the vari-

ous contacts between American Indians and Europeans and considers what the American Revolution meant to the continent's Native peoples. Dual listed with AIST 5462; cross listed with HIST 4462. *Prerequisite:* HIST/AIST 2290.

**4463. American Indian History 1783-1890. 3.** Surveys the history of American Indians during the era of westward expansion. Examines the impact of American westward movement and also the manifold changes that accompanied Indians moving west. Dual listed with AIST 5463; cross listed with HIST 4463. *Prerequisite:* HIST/AIST 2290.

**4464. American Indians in the Twentieth Century. 3.** Surveys the history of American Indians during the 20th century. Examines the development of new cultural, social, and political forms that help create an American Indian identity. Dual listed with AIST 5464; cross listed with HIST 4464. *Prerequisite:* HIST/AIST 2290.

**4466. American Indian Ethnohistory. 3.** Surveys ethnohistorical methods and concepts and provides students concrete opportunities to use these methodologies in writing exercises. American Indian ethnohistory explores Native American experiences within their own cultural contexts. Dual listed with AIST 5466; cross listed with HIST 4466. *Prerequisite:* ANTH/AIST 2210 or HIST/AIST 2290.

**4468. American Indians in the North American West. 3.** One of the defining features of the North American West is the presence of American Indians. Through the discussion of varied readings and primary document research, the history of American Indians in the West is examined, with particular emphasis on the Great Plains and California. Dual listed with AIST 5468; cross listed with HIST 4468. *Prerequisite:* HIST/AIST 2290.

**4492. Indian Cultures of Latin America, 15C-Present. 3. [CS,G (none)]** An ethnohistorical overview of Mesoamerican and Andean Indian cultures from the 15th century to the present. Focuses on Native American responses to colonialism, capitalism, nationalism, and globalization. Recent developments, e.g., the new Indian rights movement and the Chiapas rebellion in Mexico. Cross listed with HIST 4492. *Prerequisite:* 3 hours of relevant course work in HIST (e.g., 2290, 2380, 4495, 4496) or AIST (e.g., 2210, 2290, 4100, 4465) or ANTH (e.g., 2210).

**4525. American Southwest. 3.** Explores the Southwest as the location of cultural encounters and conflicts. Focuses on the cross-cultural interchange between American Indians, Mexican Americans, and Anglo Americans

from the 15th century to the present. Cross listed with CHST/HIST 4525. *Prerequisite:* HIST 1210/1211, HIST 1220/1221. (Normally offered spring semester)

**4546. Agriculture: Rooted in Diversity. 3. [C,D (none)]** Addresses multiple themes related to diversity in agriculture with the goal of making visible the experiences of minorities and women in agriculture. Involves significant independent research, class discussion, project development, and development of oral and written communication skills. Establishes linkages with supporting disciplines. Cross listed with AGRI/CHST/ENGL/FCSC/AMST/HIST 4546. *Prerequisites:* junior class standing or consent of instructor and concurrent enrollment or major in any of the following: ethnic studies, agriculture, American studies, anthropology, English, history, sociology, or women's studies.

**4740. Native American Languages and Cultures. 3.** Demonstrates the interrelationship of language and culture in several Native American communities. Examines anthropological and linguistic theories regarding language spread and the peopling of North America, narrative performance, translation, and the connection between linguistic structures and cultural features. Cross listed with ANTH 4740. *Prerequisite:* ANTH 4760.

**4975. Independent Study. 1-4 (Max. 8).** Directed, independent study in American Indian issues with American Indian Studies affiliated faculty. Students must initiate a project with an appropriate faculty member and have it approved by the program director. *Prerequisite:* consent of instructor and 6 hours of AIST.

**4990. Special Topics. 1-4 (Max. 9).** Current research topics presented by regular and visiting faculty. *Prerequisite:* 3 hours of AIST courses.

**5000. Independent Study. 1-4 (Max. 4).** Conference course to permit students opportunity for directed and independent study in American Indian issues. *Prerequisite:* graduate standing and consent of instructor.

**5110. Foundations of American Indian Education. 3.** Examines cultural, geographical, linguistic, spiritual, political, and societal factors before, during, and after colonization of the Americas. Definitions and day-to-day realities of terms like ethnocentrism, cultural relativism, assimilation, acculturation, and institutional racism. Development of insights into positive teacher-pupil-community relationships that honor culture and language differences and enhance achievement. Dual listed with AIST 4110; cross listed with EDCI 5110. *Prerequisite:* AIST 1001 and 15 credit hours of AIST or EDST.

**5121. History and Philosophy of American Indian Education. 3.** Addresses the history of Indian education in the U.S. and Canada and examines missionary initiatives, government programs, and tribal efforts. Review of documentary accounts of Native education, review autobiographical accounts of Native teachers and children. Develop insight necessary for development of appropriate teaching methods and materials. Cross listed with EDCI 5121. *Prerequisite:* post-Baccalaureate status.

**5130. Cultural Foundations of American Indian Education. 3.** In-depth study and analysis of the educational experiences of American Indians, focusing on contemporary educational issues and experiences, examining the impacts of cultural orientations, stereotypes, bias, and other issues on the educational attainment of American Indian students. Critique instructional practices and programs developed addressing the needs of American Indian students. Cross Listed with EDCI 5130. *Prerequisite:* post-Baccalaureate status.

**5141. Instructional Methods of American Indian Education. 3.** Addresses culturally responsive methodologies for teaching American Indian students, reviews documentary accounts of Native education and autobiographical accounts of Native teachers and children, develops appreciation of the complexity and difficulties of Native education. Insight necessary for development of appropriate teaching methods and materials. Cross listed with EDCI 5141. *Prerequisite:* post-Baccalaureate status.

**5360. American Indian Women. 3.** Explores the lives of American Indian women in a variety of contexts through time. The complexity and diversity of Indian women's experiences throughout history are emphasized. Concerns Indian women's lives within the reality of European American colonization and its consequences for Indian peoples. Dual listed with AIST 4360; cross-listed with WMST/SOC 5360. *Prerequisite:* 6 hours of 2000-level AIST courses.

**5462. American Indian History to 1783. 3.** Surveys the history of American Indians from the period before contact to the end of the American Revolution. Examines the various contacts between American Indians and Europeans and considers what the American Revolution meant to the continent's Native peoples. Dual listed with AIST 4462; cross listed with HIST 5462. *Prerequisite:* HIST/AIST 2290.

**5463. American Indian History to 1890. 3.** Surveys the history of American Indians during the era of westward expansion. Examines the impact of American westward movement

and also the manifold changes that accompanied Indians moving west. Dual listed with AIST 4463; cross listed with HIST 5463. *Prerequisite:* HIST/AIST 2290.

**5464. American Indian History in the 20th Century. 3.** Surveys the history of American Indians during the 20th century. Examines the development of new cultural, social, and political forms that help create an American Indian identity. Dual listed with AIST 4464; cross listed with HIST 5464. *Prerequisites:* HIST/AIST 2290.

**5466. American Indian Ethnohistory. 3.** Surveys ethnohistorical methods and concepts and provides students concrete opportunities to use these methodologies in writing exercises. American Indian ethnohistory explores Native American experiences within their own cultural contexts. Dual listed with AIST 4466; cross listed with HIST 5466. *Prerequisite:* ANTH/AIST 2210 or HIST/AIST 2290.

**5468. American Indians in the West. 3.** One of the defining features of the North American West is the presence of American Indians. Through the discussion of varied readings and primary document research, the history of American Indians in the West is examined, with particular emphasis on the Great Plains and California. Dual listed with AIST 4468; cross listed with HIST 5468. *Prerequisites:* HIST/AIST 2290.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: Credit in this course may not be included in a graduate program of study for degree purposes.

## American Studies

Cooper House, 766-3898

FAX: (307) 766-3700

Web site: [www.uwyo.edu/ams](http://www.uwyo.edu/ams)

Director: Frieda E. Knobloch

### Professors:

**JOHN D. DORST**, B.A. Oberlin College 1974; M.A. University of California-Berkeley 1977; Ph.D. University of Pennsylvania 1983; Professor of American Studies 1996, 1989.

**FRIEDA E. KNOBLOCH**, B.A. Cornell University 1985; Ph.D. University of Minnesota 1994; Professor of American Studies 2014, 1997.

**ERIC J. SANDEEN**, B.A. University of Notre Dame 1970; M.A. University of Iowa 1976; Ph.D. 1977; Director of American Studies 1982; Professor of American Studies 1994, 1982.

### Associate Professor:

**BETH LOFFREDA**, B.A. University of Virginia; M.A. Rutgers University; Ph.D. 1997; Associate Professor of American Studies 2014, 1998.

### Assistant Professors:

**ULRICH ADELTE**, Magister Artium, University of Hamburg 2000; M.A. University of Iowa 2005; Ph.D. 2008; Assistant Professor of American Studies and African American and Diaspora Studies 2009, 2012.

**LILIA SOTO**, B.A. University of California-San Diego 2000; M.A. University of California-Berkeley 2003; Ph.D. 2008; Assistant Professor of American Studies and Latina/o Studies 2010, 2012.

### Academic Professional Research Scientist

Andrea Graham

### Adjunct Faculty:

(See Catalog section following name for academic credentials)

**Catherine Connolly**, Gender and Women's Studies

**R. McGregor Cawley**, Political Science

**Colleen Denney**, Art

**William J. Gribb**, Geography

**Michael Harkin**, Anthropology

**Jeanne Holland**, English

**Philip J. Roberts**, History

**David Romtvedt**, English

**Audrey Shalinsky**, Anthropology

The interdisciplinary major in American studies emphasizes the integration of the humanities, fine arts and social sciences in the study of American experience, past and present. The program places special emphasis on interaction with contemporary American culture through course work, field experiences and internships so that each student can apply academic knowledge to real life circumstances. Many students choose among literature, history, geography or anthropology for their distributed course requirements, but major areas of course work may include political science, mass media, the fine arts, sociology, philosophy, or environment and natural resources. With the help of an American Studies program adviser, each student plans an individualized course of study emphasizing as academic interest, a career goal and/or preparation for further education in law or graduate school. Although the focus of the program is broad, many students choose to emphasize nature and culture in the U.S., American cultural diversity, or preparation for a career in the public sector (museums, historic sites, interpretive center, etc.).

## Undergraduate Major

The interdisciplinary major in American Studies emphasizes the integration of the humanities, fine arts, and social sciences in the study of American experience, past and present. Through its **core** of American Studies courses, the program places special emphasis on interaction with contemporary American culture through course work, field experiences, and internships so that each student can apply academic knowledge to real life circumstances. With the help of an American Studies adviser, students can choose courses in almost all disciplines and fields in the College of Arts and Sciences - most typically, literature, history, geography, anthropology, sociology, art history, women's studies, political science, African American studies, American Indian studies, Latina/o studies, or environment and natural resources - for their **theme** requirements. The individualized course of study proposed by each student should emphasize an academic interest, a career goal, and/or preparation for further education in law school or a graduate program. Although the focus of the program is broad, many students choose to emphasize environmental studies, American cultural diversity, secondary level teaching, or preparation for a career in the public sector (museums, historic sites, interpretive centers, etc.).

Through the following curriculum, students develop individual programs of study, with their advisers, to understand and engage American cultures.

### 1. Foundation (12 credits):

AMST 2010 and AMST 2110

Two of the following: AAST 1000, AIST 1350, CHST 1100, ENR 2000, (either HIST 1210 or HIST 1220), RELI 1000, or WMST 1080.

### 2. Concentration (27 credits)

**Core.** Each student must take three AMST courses at the 3000-4000 level, excluding the senior seminar. These seminars are designed to maintain an interdisciplinary view of American culture and to foster an American Studies community (9 credits).

**Theme.** An American Studies theme is devised, in consultation with the student's adviser, and is presented to the American Studies core faculty in writing as a proposed course of study. This proposal is usually made at the end of the second year of study (or upon completion of 60 hours of course work toward graduation), since the document guides the student through an exploration of American culture. Typical themes include: American diversity, environment and society, material

culture and everyday life, visual culture and media, American cultural history, American institutions and public culture, the United States in international perspective. The theme must include a minimum of 6 credits and a maximum of 9 credits in a single discipline. Up to 3 credits can be granted for courses at the 1000-2000 level (18 credits).

### 3. Capstone (6 credits):

Senior seminar plus an individual project stemming from either AMST 4010 (independent study) or AMST 4970 (internship).

Students pursuing Program honors should also write an undergraduate thesis.

## Internships

The internship experience is essential for students specializing in public sector American studies. The program has an active program of paid internships that can place students in work environments in Wyoming, other parts of the U.S., or in selected foreign countries.

## Exchanges

The program has established semester or academic year exchanges with universities in Great Britain, the Netherlands, Denmark and New Zealand in order to encourage an international understanding of American culture. The Elaine Kay Clatterback Fund supports majors who are spending this valuable time abroad.

## Financial Aid

The William Robertson Coe Fellowship supports undergraduate tuition. The Long-Findeisen Fund supports individual research or exhibition projects. The Elaine K. Clatterback Fellowship assists students engaged in an international exchange. The internship program provides students with a stipend while engaged in a program-approved internship.

## Teacher Education

Teacher certification in elementary or secondary (social studies) is available by arrangement with the College of Education. Students will be assigned an adviser from the College of Education, as well as from American Studies.

## Certificate

The certificate program allows students to choose from undergraduate and graduate courses in American Studies, literature, geography, music, art, history, philosophy, sociology, folklore, anthropology, American Indian studies, political science, environmental studies, and media studies. The program encompasses two semesters of full time work: a total of at least 24 semester hours, or approximately 8 courses. Of these, 6 hours (2 courses) must be selected from the following list:

AMST 2010 or 2110 .....3  
and  
AMST 4300, 5550 or 4020.....3

An additional 18 hours (6 courses) are chosen in consultation with an American Studies faculty adviser. The final 3 credit hours, completed during the summer months, are devoted to an internship (AMST 4385) or field experience in American culture (AMST 4990).

## Undergraduate Minor

Students may minor in American Studies through a program of 24 credits of study, some which may be matched with major requirements in related disciplines and fields. For details, see the list of eligible courses at [www.uwyo.edu/ams](http://www.uwyo.edu/ams).

## Graduate Study

The program offers an interdisciplinary course of study leading to the master of arts degree. The program also supports a historic preservation concentration that involves studio courses and field experience. Other specific paths through the American Studies curriculum are tailored to the needs of the students. Semester exchange programs reinforce an international perspective on American culture.

## Program Specific Admission Requirements

A significant writing sample (usually a seminar paper or, for those coming from technical fields, a major report) that demonstrates potential for graduate study.

## Program Specific Degree Requirements

Degree requirements based on university minimum requirements. Successful completion of the following: AMST 5500/5510 with a grade of "B" or better, three additional American Studies courses and a Thesis or Plan B (non-Thesis) project.

## American Studies (AMST)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◆Q]).

**1000. Cultures Of College: Why We Are Where We Are. 3.** Introduces students to backgrounds, environments, assumptions that shape our experience of higher education. Two objectives: to familiarize first-year students with college experience through inquiry into meanings of campus, and to familiarize students with interdisciplinary study.

**1030. Social Justice in the 21st Century. 3. [I,D◆(none)]** Appropriate for students interested in diversity and social justice. Topics covered through an interdisciplinary study of people and society range from identity, critical thinking, empowerment, role models, stereotyping, institutional discrimination, and tolerance. The key lynchpin is active participation in the development and maintenance of just communities. Cross listed with AAST/AIST/WMST/CHST 1030. Enrollment preference will be given to We The People FIG students.

**1101. First-Year Seminar. 3. [(none)◆FYS]**  
**2010. Introduction to American Studies. 3. [CH,WB◆H]** Introduces the interdisciplinary study of American culture. Focuses on themes, values and ideas which continue to reverberate through our cultural experience. (Offered at least once each year)

**2110. Cultural Diversity in America. 3. [CS,D◆H]** Studies processes by which individuals and groups produce, maintain and express cultural identities in the U.S. Race, gender and ethnicity are addressed, emphasizing historical roots and social context of contemporary cultural varieties. (Offered one semester each year)

**2400. Introduction to Historic Preservation. 3.** Online course introduces students to historic preservation theory and philosophy, the history of the preservation movement and contemporary historic preservation as practiced in the public, nonprofit and private realms. Assignments include reading, research, online discussion and lectures (podcasts, videos or PowerPoint presentations), as well as directed field work.

**2700. Introduction to Museology. 3. [CH◆(none)]** Explores the historical, cultural, and contemporary roles of museums and preservation institutions in society. Introduces students to the museum professions, collection and exhibition installation strategies, and ethical problems of governance and collection. Field trips to regional collections are included. Cross listed with ART/ANTH/HIST 2700. Prerequisite: WA.

**3050. Cultures of Nature in the United States. 3.** Uses artistic, philosophical, historical and literary material to investigate how ideas about and representations of nature have changed over time in the U.S. Culminates in an examination of a wide range of contemporary environmental ideas within this broad historical and cultural context. Cross listed with ENR/WMST 3050. Prerequisite: 2000-level course in one of the following departments: AMST, American history, American literature, or a 2000-level course approved for the ENR program.

**3100. Food in American Culture. 3. [C, D, none]** An interdisciplinary exploration of food as a medium of cultural expression, social interaction, and aesthetic experience in American life, both past and present. Examines food as, among other things, a symbolic system, a vehicle of social communication, and an arena for the performance of regional ethnic, gender, etc. identities. Prerequisite: any 2000-level course in American Studies, or ANTH 1200.

**3800. Chicanas/os in Contemporary Society. 3. [CS, D, none]** Focuses on three major movements within the Chicana/o community; labor, nationalism, and feminism. Students will assess these three movements to determine what role they have played in transforming the social conditions and political identity of the Chicana/o and Latina/o population in the US. Cross listed with CHST/WMST 3800. Prerequisite: CHST 1100 or WMST 1080 or AMST 2010.

**3400. Popular Music and Sexualities. 3. [CH, D, none]** Looks at ways in which popular music has intersected with sexual and gendered identities as a means and expression of both oppression and liberation. Cross listed with WMST 3400. Prerequisite: WA.

**4010. Independent Study. 1-3 (Max. 6).** For upper division students in any major who can benefit from independent study in American Studies with minimal supervision. Dual listed with AMST 5010. Prerequisite: 3 hours in American Studies and approval of instructor.

**4020. American Folklife. 3.** Introduces materials and methods of folklife research, examining both verbal and nonverbal expressions of traditional cultures in America. Topics include material culture, belief systems, traditional events and celebrations, and folk performances of many kinds. Dual listed with AMST 5020. Prerequisite: Any six hours from among AMST 2010, 2110, ENGL 2400, AIST 2340, AAST 2450 2730, 3000, 3010. (Offered once each year)

**4030. Ecology of Knowledge. 3.** Examines the development of “disciplines” and explores definitions, theories, methods and practices of interdisciplinary work. Cross listed with ENR 4030. Dual listed with AMST 5030. Prerequisite: 3 hours in any interdisciplinary program.

**4040. Historic Preservation and Sustainability. 3.** Explores the historic preservation and sustainability movements and contemporary practices in these inter-related fields. Through reading, lectures, discussions and site visits, students will study how the historic preservation and the building industry professions can address advanced issues in sustainability related to the environment, culture and economics. Cross listed with ARE 4040. Prerequisite: 6 hours in AMST or ARE.

**4051. Environmental Politics. 3. [WC, D, none]** Analyzes environmentalism as a political phenomenon. Provides a basic understanding of how to analyze political issues by: (1) examining the historical and contemporary issues that produce controversy over environmental matters; and (2) surveying the impacts of these issues on the formulation and implementation of laws, policies, and regulations. Cross listed with POLS, ENR, GEOG and REWM 4051. Prerequisite: POLS 1000.

**4052. Federal Land Politics. 3.** Examines the political forces that have shaped and continue to shape federal land policy and management. Explores the interactions between democratic decision making and science in the management of federal lands. Surveys the sources of controversy over federal land management and methods for harmonizing public demands with technical expertise. Cross listed with POLS/ENR/GEOG/REWM 4052. Prerequisite: POLS 1000.

**4250. The Harlem Renaissance. 3. [D, none]** Examines the florescence of African American creativity, centered in Harlem, New York, between the end of World War I and the onset of the Great Depression. This movement had a tremendous impact on African American culture in and outside of the U.S., including Africa and the Caribbean. Dual listed with AMST 5250; cross listed with AAST 4250. Prerequisite: AAST 1000, AMST 2010, AMST 2110, any AAST 2000-level course, junior or senior standing, or nine credit hours in any level AMST course.

**4300. American Culture and the Public Sector. 3.** Surveys American culture studies in the public sector. Topics include history and theory of public sector humanities and social sciences; types of public sector jobs and institutions where public humanists work; and public sector work in specific disciplines, such

as history, anthropology, folklore, archaeology and art history. Dual listed with AMST 5300. Prerequisite: 12 credits in humanities or social science courses having to do with American culture. (Offered once a year)

**4500. American Civilization. 1-8 (Max. 8).** Explores various interdisciplinary approaches to the American experience, past and present. May include topical, thematic, historical, literary and cultural integrations; for a given semester, the course’s precise focus will be indicated in the class schedule.

**4546. Agriculture: Rooted in Diversity. 3. [C, D, none]** Addresses multiple themes related to diversity in agriculture with the goal of making visible the experiences of minorities and women in agriculture. Involves significant independent research, class discussion, project development, and development of oral and written communication skills. Establishes linkages with supporting disciplines. Cross listed with AGRI/AIST/CHST/ENGL/FCSC/HIST 4546. Prerequisite: junior class standing or consent of instructor and concurrent enrollment or major in any of the following: ethnic studies, agriculture, American studies, anthropology, English, history, sociology, or women’s studies.

**4640. Art and Ecology. 3.** Focuses on the intersection of contemporary art with ecological concerns. Readings present philosophical, historical and cultural aspects of the art/ecology relationship; students reflect and question their own beliefs. Examples of art/artists are reviewed as well as how ecological artwork is developed. Students propose solutions and/or create art in, out of, or about the environment; local sites are encouraged. Prerequisite: 6 hours of ART and/or AMST or consent of the instructor.

**4650. Women, Gender & Migration. 3.** From an international context and perspective, this course examines the gendered transformations immigrant women experience. Gender, theories of international migration, assimilation, race, ethnicity, and identity transformation serve as categories of analysis. From a cross-discipline comparative approach, we focus on women’s lives to examine differences and similarities to complicate notions of immigration. Cross listed with CHST/INST/WMST 4650. Dual listed with AMST 5650. Prerequisite: Junior standing and 6 hours of AMST, CHST, INST, and/or WMST coursework or instructor approval.

**4800. Historic Preservation. 3.** Review of the roots of historic preservation in Western culture with an emphasis on the historical and legal context of architectural conservation in

America. Current issues in preservation are examined through case studies and guest presentations. Cross listed with ENR 4800. Dual listed with AMST 5800. *Prerequisite:* ARE 3020 or AMST 5400.

**4900. Field Studies in Historic Preservation. 1-4 (Max. 4).** Acquaints students with current issues in historic preservation by visiting places of importance in U.S. and Europe. Agencies and institutions involved in building conservation provide specific expertise at sites visited. *Prerequisite:* 3 hours of architectural history or 6 hours of art history. (Offered based on sufficient demand and resources)

**4970. Internship. 1-3 (Max. 6).** Gives undergraduate students practical experience by working on a project at a public institution, agency or educational/cultural organization. Offered for S/U only. *Prerequisites:* junior standing, 3.0 GPA, completion of AMST 2010 and 12 hours in major with 3.25 GPA minimum in major and consent of instructor.

**4985. Senior Seminar. 3. [WC♦(none)]** With AMST 4010 or 4970, completes the capstone coursework in AMST. Identifies a broad intellectual tradition in American Studies as foundation for student's research interests; builds a specific scholarly context appropriate to student's research; culminates in a substantial piece of written research appropriate in an identified subfield of American Studies. *Prerequisite:* senior standing in American studies or consent of program director.

**5010. Independent Study. 1-6 (Max. 6).** For graduate students in any graduate program who can benefit from independent research and writing in American Studies. Dual listed with AMST 4010. *Prerequisites:* 3 hours in American Studies and consent of instructor.

**5020. American Folklife. 3.** Introduces materials and methods of folklife research, examining both verbal and nonverbal expressions of traditional cultures in America. Topics include material culture, belief systems, traditional events and celebrations, and folk performances of many kinds. Dual listed with AMST 4020. *Prerequisites:* any six hours from among: AMST 2010, ENGL 2400, AIST 2340, AAST 2450, 2730, 3000 or 3010.

**5030. Ecology of Knowledge. 3.** Examines the development of "disciplines" and explores definitions, theories, methods and practices of interdisciplinary work. Cross listed with ENR 5030. Dual listed with AMST 4030. *Prerequisite:* graduate status.

**5200. Material Culture. 3.** Designed to introduce advanced students to the theory, methods, and practice of material culture study. A significant portion of the course will be devoted to a studio exercise in which students collectively document and analyze a material culture form that has been designated by the instructors. *Prerequisite:* graduate standing or consent of instructor.

**5250. The Harlem Renaissance. 3.** Examines the florescence of African American creativity, centered in Harlem, New York, between the end of World War I and the onset of the Great Depression. This movement had a tremendous impact on African American culture in and outside of the U.S., including Africa and the Caribbean. Dual listed with AMST 4250; cross listed with AAST 5200. *Prerequisites:* AAST 1000, AMST 2010, AMST 2110, any AAST 2000-level course, junior or senior standing, or nine credit hours in any level AMST course.

**5300. American Culture and the Public Sector. 3.** A survey of American culture studies in the public sector. Topics covered include the history and theory of public sector humanities and social sciences, types of public sector jobs and institutions where public humanists work, and public sector work in specific disciplines such as history, anthropology, folklore, archaeology, and art history. Dual listed with AMST 4300. *Prerequisite:* graduate status.

**5400. American Built Environment. 3.** Examination of America's built environment from pre-Colonial times to the present day. Factors affecting the architecture and built form of a given period are discussed together with what the material legacy says about the culture of the period. *Prerequisite:* ARE 3020.

**5500. Topics in American Studies. 3.** Selected problems in the theory, practice, and bibliography of American studies. Required of graduate majors in the program and is recommended for students with an interdisciplinary interest in American Culture. *Prerequisites:* survey knowledge of American literature and history; graduate standing or consent of instructor.

**5510. Readings in American Studies. 3.** Selected readings in the theory, practice, and bibliography of American Studies. Surveys scholarship in the field and is designed to help graduate students develop thesis topics. *Prerequisites:* graduate standing in American studies or related field; consent of instructor.

**5550. Varieties of Literary Evidence. 3.** Selected problems in the use of literary evidence for American studies scholarship. *Prerequisites:* graduate standing in American studies or a related field; consent of instructor.

**5560. Black Popular Culture. 3.** Approaches African American popular culture from theoretical perspectives which include black feminist, postcolonial, and poststructuralist analyses. Cross listed with AAST 5560. *Prerequisites:* graduate standing; instructor consent for undergraduate students.

**5650. Women, Gender & Migration. 3.** From an international context and perspective, this course examines the gendered transformations immigrant women experience. Gender, theories of international migration, assimilation, race, ethnicity, and identity transformation serve as categories of analysis. From a cross-discipline comparative approach, we focus on women's lives to examine differences and similarities to complicate notions of immigration. Cross listed with CHST/INST/WMST 5650. Dual listed with AMST 4650. *Prerequisites:* Junior standing and 6 hours of AMST, CHST, INST, and/or WMST coursework or instructor approval.

**5800. Historic Preservation. 3.** Review of the roots of historic preservation in Western culture with an emphasis on the historical and legal context of architectural conservation in America. Current issues in preservation are examined through case studies and guest presentations. Cross listed with ENR 5800. Dual listed with AMST 4800. *Prerequisite:* ARE 3020 or AMST 5400.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: Credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrolled in a graduate degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Anthropology

106 Anthropology Building, 766-5136

FAX: (307) 766-2473

Web site: www.uwyo.edu/anthropology

Department Chair: James Ahern

### Professors:

**JAMES AHERN**, B.A. Beloit College 1991; M.A. Northern Illinois University 1993; Ph.D. University of Michigan 1998; Professor of Anthropology 2014, 2000.

**MICHAEL E. HARKIN**, B.A. University of North Carolina 1980; M.A. University of Chicago 1984; Ph.D. 1988; Professor of Anthropology 2003, 1993.

**ROBERT L. KELLY**, B.A. Cornell University 1978; M.A. University of New Mexico 1980; Ph.D. University of Michigan 1985; Professor of Anthropology 1997.

**MARCEL KORNFELD**, B.A. University of New Mexico 1974; M.A. University of Wyoming 1982; Ph.D. University of Massachusetts-Amherst 1994; Professor of Anthropology 2008, 1996.

**MARY LOU LARSON**, B.A. University of Wyoming 1976; M.A. University of California-Santa Barbara 1982; Ph.D. 1990; Professor of Anthropology 2007, 1996.

**LIN A. POYER**, B.A. Bucknell University 1975; M.A. University of Michigan 1978; Ph.D. 1983; Professor of Anthropology 2003, 1997.

**AUDREY C. SHALINSKY**, B.A. University of Chicago 1973; M.A. Harvard University 1975; Ph.D. 1979; Professor of Anthropology 1991, 1980.

**SARAH STRAUSS**, A.B. Dartmouth College 1984; M.P.H. San Jose State University 1987; Ph.D. University of Pennsylvania 1997; Professor of Anthropology 2014, 1997.

### Associate Professors:

**PAMELA INNES**, B.A. Bryn Mawr College 1986; M.A. University of Oklahoma 1992; Ph.D. 1997; Associate Professor of Anthropology 2007, 2001.

**MELISSA MURPHY**, B.A. Haverford College 1994; Ph.D. University of Pennsylvania 2004; Associate Professor of Anthropology 2014, 2008.

**TODD SUROVELL**, B.S. University of Wisconsin-Madison 1995; M.A. University of Arizona 1998; Ph.D. 2003; Associate Professor of Anthropology 2009, 2003.

**NICOLE WAGUESPACK**, B.A. Colorado State University 1996; M.A. University of Wyoming 1999; Ph.D. University of Arizona 2003; Associate Professor of Anthropology 2009, 2003.

### Assistant Professors:

**ADAM HENNE**, B.A. Drew University 1997; M.Sc. University of Georgia 2008; Ph.D. 2008; Assistant Professor of Anthropology 2012, 2008.

**ALEXANDRA KELLY**, B.A. University of Chicago 2004; M.A. 2005; Ph.D. Stanford University 2014; Assistant Professor of History and Anthropology 2014.

**JASON TOOHEY**, B.A. University of California Santa Barbara 1995; M.A. California State University Northridge 2000; M.D. University of California Santa Barbara 2009; Assistant Professor of Anthropology 2011.

### Adjunct Faculty:

Adams, Becker, Clautor, Dewey, Gingrich, Miller, Naudinot, Peterson, Peterson, Pierce, Rapson, Smith, Walker, Watson

### Academic Professional Research

#### Scientist:

Rick Weathermon

### Professors Emeriti:

George C. Frison, George W. Gill, Charles A. Reher

The department of Anthropology promotes the understanding of humankind from an integrated, holistic approach which examines past, present and future trends in cultural, biological and linguistic diversity and uniformity. Though the department serves undergraduate and graduate majors who will become professional anthropologists or will pursue other related careers, it also provides information to a large number of non-majors and to the larger community regarding cross-cultural issues. Furthermore, because of its commitment to the four field approach including biological anthropology, archaeology, cultural anthropology and linguistic anthropology, the department fosters among its students an awareness of the interrelatedness of scientific concepts, methods and theories, and the humanistic foundation of scientific inquiry. The Department of Anthropology prepares its students both to understand the cultural resources of Wyoming and to participate as informed citizens in an increasingly complex global community.

### Undergraduate Major

In addition to university and college requirements listed in this *Catalog*, anthropology majors must complete three semesters of foreign language and a statistics course—STAT 2050 or 2070. Anthropology majors must complete two lab science courses outside the major. Specific requirements for a B.A. in anthropology are ANTH 1100, 1200, 1300, 2000,

3300, 3310, 4010; one course from each of the following series: archaeology, ANTH 4110, 4111, 4115, 4116, 4120, 4125, 4130, 4150, 4160, 4170, 4190 or six credits of archaeological field school (ANTH 4140 or 5180); cultural anthropology—ANTH 4300, 4310, 4320, 4325, 4330, 4340, 4350, 4360, 4380, 4020 (with instructor's consent); linguistic anthropology—ANTH 4740, 4775, 4785, 4795, 4020 (with instructor's consent); and biological anthropology—ANTH 4210, 4215, 4220, 4230, 4255, 4260, 4020 (with instructor's consent). ANTH 1101, First-Year Seminar, is recommended for anthropology majors, although not required. In some cases (e.g., ANTH 3300, 3310) students will be required to take one hour of a section of ANTH 4975. Courses in the major must be completed with a grade of C or better.

At the completion of the Bachelor of Arts degree in Anthropology, students will be able to demonstrate knowledge about the four subfields of anthropology and their interrelationships; they will have participated in a research experience and understand its process; and, they will demonstrate ability to analyze and synthesize in relation to anthropological issues or theories.

### Undergraduate Minors

The minor for non-anthropology majors requires two of the introductory courses: ANTH 1100, 1200, 1300, 2000, and 11-12 hours of electives from 2000, 3000, or 4000-level anthropology courses with no more than 3 hours at the 2000-level. See the anthropology web site for more details.

### Teacher Education

Anthropology courses may be used to complete part of the requirements for teacher certification in social studies.

### Graduate Study

The department offers programs of study leading to Master of Arts and Doctor of Philosophy degrees in Anthropology. Check Anthropology department web pages for any updates.

### Program Specific Admission Requirements

#### Master's Program

Deadline for application is March 1 for the following fall.

See graduate admission requirements.

Submit letter of intent, resume, copies of GRE scores, transcripts, and an optional writing sample as digital documents to the UW online application system. A minimum of three letters of recommendation are required; a standardized recommendation form is provided through the application system.

In the letter of intent, students should describe their research interests, career goals, and how Wyoming's program will help them achieve these goals.

The Department of Anthropology requires that at least two of the recommendation letters be from academic supervisors or instructors.

Students must present evidence of a satisfactory background in anthropology, which should include coursework in all four subfields of Anthropology (socio/cultural, bio/physical, archaeology, and linguistics). Deficiencies in anthropology may require remediation. Students must have three semesters of a single foreign language or equivalent, and one semester of statistics. In those instances in which the undergraduate background of the student is deficient, the department reserves the right to prescribe course work that would correct such deficiencies.

The M.A. program is designed to be completed in two full years of graduate study. Appropriate allowance will be made for part-time students.

Students who graduate with a Master of Arts degree will be able to explain the content of the four fields of Anthropology and their interrelationship in written and oral formats; they will have an experience in original research; and, they will develop skills which foster professionalism in their chosen fields.

**Doctoral Program**

Deadline for application is December 15 for the following fall.

See graduate admission requirements.

Submit letter of intent, resume, copies of GRE scores, transcripts, and an optional writing sample as digital documents to the UW online application system. A minimum of three letters of recommendation are required; a standardized recommendation form is provided through the application system.

In the letter of intent, students should identify whom they would like as their faculty adviser and describe their research interests, career goals, and how Wyoming's program will help them achieve these goals.

Note: Contact department for GRE requirements and preferences.

Students with a master's degree may apply directly to the Ph.D. program.

Students with a bachelor's degree may apply to the Ph.D. program. If admitted, students are expected to complete the master's degree requirements following the Plan A or Plan B option before formal admission to the Ph.D. program. At the thesis defense or hearing for the Plan B paper, the student will receive a no pass, pass-terminate at the master's degree, or a pass-admit to the Ph.D. program.

Students admitted to the department's M.A. program are not guaranteed admission to the Ph.D. program.

For admission to the Ph.D. program with the Bachelor's degree, students must have course work in the four subfields of anthropology, three semesters of a single foreign language, and statistical competency at either the B.A. or M.A. level. If these are not satisfied, the student's faculty adviser in coordination with the student's graduate committee assigns remedial work as appropriate.

Students who graduate with a Ph.D. in Anthropology will have specialized and professional training so they can move into academic or non-academic tracks; they will have a dissertation experience that results in professional publications; and they will have professional experiences that facilitate their move into careers in a reasonable amount of time.

**Program Specific Graduate Assistantships**

Doctoral students generally receive two years of assistantships. First semester, first year M.A. students are generally not awarded assistantships; however, the department occasionally does make exceptions. M.A. students are eligible to apply for assistantships beginning in the second semester.

Assistantships are awarded through a departmental application process. An application form, cover letter, and resume are required.

Information and deadlines may be obtained in the department office.

Failure to complete steps in the M.A. program by established deadline (e.g., advisor selection, proposal presentation, etc.) means the student is not eligible for an assistantship. Failure of the Ph.D. preliminary exam means the student is not eligible for an assistantship.

**Program Specific Degree Requirements**

**Master's Program Plan A (thesis)**

See university minimum requirements.

Completion, with a grade of "B" or better of a four core-course sequence. This sequence will consist of ANTH 5010, 20th Century Anthropological Theory; ANTH 5015, Archaeological Theory and Method; ANTH 5020, Biological Anthropology; and ANTH 5030, Linguistic Anthropology.

First semester (fall): Students will submit form to the graduate advisor and department head identifying their thesis advisor BEFORE the graduate assistant allocation meeting (mid-late November).

Second semester (spring): Students will work with their advisor to select their committee, which must be formed and on-file in the department office by the end of the semester. During the core classes' final exam periods, students give a presentation to departmental faculty which outlines the general ideas for their proposed thesis.

Third semester (fall): Working closely with their advisor and committee, students complete a detailed prospectus and gain approval from thesis committee for MA thesis topic.

Fourth semester (spring): Thesis is completed and is approved by thesis committee.

Any M.A. student receiving a grade of C or less in two core classes will be expelled from the program.

Second semester research presentations are assessed by all department faculty in attendance at the presentation and evaluations will be given to the student's advisors. It is expected that students will work closely with their advisors to rectify any problems before they complete their thesis prospectus in the third semester.

If not completed prior to admission; three semesters of a single foreign language and one statistics course must be completed.

**Plan B (non-thesis)**

See university minimum requirements.

All requirements for a Plan A except thesis, if not completed prior to admission; three semesters of a single foreign language and one statistics course must be completed.



**Doctoral Program**

See university minimum requirements.

After completion of an M.A. program in anthropology.

A minimum of six content courses (18 hours) chosen by the student in conjunction with the student's committee. These courses are normally completed in the first two years of the Ph.D. program. In addition to anthropology courses, the other 4000/5000-level courses outside of the department may be required by the committee or chosen by the student in consultation with their committee.

Two additional courses in their first or second year: ANTH 5880, Professionalism in Anthropology and the two-semester sequence of ANTH 5000, Teaching and Learning in Anthropology (6 hours).

Teaching experience, including stand-alone courses, after completion of the first semester of Teaching and Learning (ANTH 5000), as well as teaching assistance to UW faculty members.

Participation in an approved internship experience (6-24 credit hours). Students pursue internships in state and federal agencies, museums, contract archaeology organizations, and other organizations that offer potential career experience.

Committee meeting and successful completion of a dissertation proposal.

Preliminary exams take place after the completion of 18 hours of content courses. ANTH 5880, and Teaching and Learning in Anthropology (ANTH 5890, or other as designated), normally before the end of the second year. If a student does not receive a passing grade on the preliminary exam, it can be repeated once. Failure to pass the preliminary examination the second time results in termination from the anthropology program.

International experience is highly recommended but not required, e.g. pre-dissertation summer fieldwork.

Student maintains a portfolio which documents teaching, internship, and research experience.

Students are encouraged to present papers at professional conferences and submit articles for publication throughout their tenure as a student. After admission to candidacy, the student is expected to research, write, and defend a dissertation based on original research (up to 48 credit hours). Students may either submit a single dissertation or a series of integrated publishable articles (30-40 pages

each). The student's committee must approve this choice and decide on the number, length and content of the articles at the same time, usually at the committee hearing prior to the preliminary exams.

## Anthropology (ANTH)

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).**

**1000. Intellectual Community in Anthropology. 1-3 (Max. 3) [I◀▶(none)]** Orients students to the major and UW facilities important to academic success. In addition, skills such as critical thinking are emphasized through reading and discussion of articles on anthropological questions. Faculty panels introduce students to a variety of current topics in anthropology. *Prerequisite:* available to first or second semester freshmen through controlled enrollment. Students in ANTH, HIST and other social sciences have priority.

**1100. Introduction to Biological Anthropology. 4. [SB◀▶PN]** Basic concepts relating to the origin, evolution and biological nature of the human species.

**1101. First-Year Seminar. 3. [(none)◀▶FYS]**

**1200. Introduction to Cultural Anthropology. 3. [CS,G◀▶H]** Introduction to foreign, especially non-western, cultures through anthropological concepts, films and ethnographies.

**1300. Introduction to Archaeology. 3. [CS,G◀▶PN]** Explores ways in which prehistoric material remains can provide an understanding of the cultural way of life. General background in archaeological method and theory is used to examine case studies from throughout the world, based on themes such as ceramic technology and artistry development, growth of early civilizations and North American prehistory.

**1450. World Archaeology. 3. [CS,G◀▶H]** World Prehistory. Recommended for non-majors. A survey of the archaeology of Africa, Asia, Europe, Australia, and the Americas from the evolution of humans to the origins of agriculture to the rise of civilizations such as that of Egypt, China, and Mexico.

**2000. Introduction to Linguistic Anthropology. 3. [L◀▶COM2]** Demonstrates the interrelationship of language, human biology, and culture at the introductory level. Linguistic anthropological methods and theories are used to examine linguistic behaviors used throughout the world. *Prerequisite:* ANTH 1100, 1200 or 1300.

**2200. World Culture. 3. [CS,G◀▶(none)]** Provides an understanding of cultural behavior of people in various geographical areas of the world. Students read ethnographies, cultural descriptions of societies, written by cultural anthropologists. (Normally offered at least once a year)

**2210. North American Indians. 3. [CS,D◀▶(none)]** Comparative consideration of North American Indian culture areas at European contact period. Cross listed with AIST 2210. (Offered based on sufficient demand and resources)

**2700. Introduction to Museology. 3. [CH◀▶(none)]** Explores the historical, cultural, and contemporary roles of museums and preservation institutions in society. Introduces students to the museum professions, collection and exhibition installation strategies, and ethical problems of governance and collection. Field trips to regional collections are included. Cross listed with AMST/ART/HIST 2700. *Prerequisite:* WA.

**2730. African Creativity and Ritual. 3. [CA,G◀▶(none)]** In a thematic organization, explores both North African and sub-Saharan cultures, incorporating issues pertinent to art history, African American studies, religious studies and women's studies. Looks at music, dance, body language, festival, celebration, coming of age rituals, fertility rites, harvest and funerals. Cross listed with AAST/ART 2730.

**3015 [2015]. Introduction to the Music of the World's Peoples. 3. [WB,G◀▶(none)]** Introduces music of the world's peoples. Students actively study and document living musical traditions and hear, research and study music from a wide variety of geographical areas of the world. Cross listed with MUSC 3015. *Prerequisite:* MUSC 1000.

**3300. Ethnographic Methods in Anthropology. 3. [WB◀▶COM3]** Introduces anthropology majors to ethnographic fieldwork, the fundamental method in cultural anthropology. Students conduct fieldwork and discuss research problems including ethics and the role of the researcher. Open to students in related fields of humanities and social sciences. *Prerequisite:* ANTH 1200. (Normally offered fall semester)

**3310. Introduction to Anthropology Research Methods. 3.** Introduces anthropology majors to use of the discipline's scientific method through problem formation, research data acquisition and research techniques used by anthropologists. *Prerequisite:* ANTH 1100, 1200, and 1300. (Normally offered spring semester)

**3400. Hunters and Gatherers. 3. [(none)◀▶H]** Describes cultural adaptation of hunter-gatherer societies using both the ethnographic and archaeological record from the Arctic to tropical jungles. *Prerequisite:* ANTH 1100, 1200, or 1300. (Offered based on sufficient demand and resources)

**3420. The Anthropology of Global Issues. 3.** Using anthropology's long-term, holistic and comparative approaches, the course examines key global issues, e.g., poverty, war, disease, environmental degradation, and terrorism from an anthropological perspective. Cross listed with INST 3420. *Prerequisite:* ANTH 1200.

**3600. Archaeological Sciences. 3.** Examines the biological, chemical and physical analytical methods used to reconstruct ancient human behavior. Includes radiometric and other dating methods, analysis of DNA and other organic molecules, stable isotope analysis of bone and sediments to reconstruct diet, environment, and migrations, trace elements for sourcing materials, and remote sensing. *Prerequisite:* completion of USP science requirement.

**4000. Conference. 1-4 (Max. 4).** Guided independent study. *Prerequisites:* senior standing and 15 hours in anthropology. (Offered based on sufficient demand and resources)

**4010. History of Anthropological Thought. 3. [WC▶(none)]** Designed as the capstone course for senior majors. Surveys anthropological theory development. Explores major trends and their relationships. *Prerequisites:* ANTH 1100, 1200, 1300, 3300, and 3310. (Normally taken in student's final semester)

**4015. Archaeological Theory and Method. 3.** Introduces the students to past and present archaeological theories through a literature survey of significant topics. Addresses questions, such as: How do archaeologists identify and solve problems? What do they perceive to be problems? What is the logic of archaeological arguments? Dual listed with ANTH 5015. *Prerequisites:* ANTH 1200, 1300, 3310, and at least one 4000 regional course.

**4020. Seminar. 3-6 (Max. 6).** Considers current topics of anthropological interest. May be repeated for a maximum of 6 hours credit when the subject matter of the seminar is different. *Prerequisite:* ANTH 1100, 1200, or 1300. (Offered based on sufficient demand and resources)

**4110. Zooarchaeology I. 3.** Introductory level seminar in the archaeological analysis of faunal materials. Emphasis is on identification and curation of bones from archaeological and Late Pleistocene paleontological contexts, including their use in the interpretation of prehistoric

and historic human behavior, the investigation of paleoenvironmental conditions and paleoecological relationships and problem-oriented taphonomic research. Dual listed with ANTH 5110. *Prerequisite:* ANTH 1300.

**4111. Zooarchaeology II. 3.** Advanced level seminar in the archaeological analysis of faunal materials. Emphasis is on study of bones as an integrated component of basic archaeological research, including their use in the investigation of paleoenvironmental conditions and paleoecological relationships as well as problem-oriented taphonomic research, and the interpretation of human behavior. Dual listed with ANTH 5111. *Prerequisite:* ANTH 4110/5110.

**4115. Lithic Analysis. 3.** An overview of the analysis of stone tools and waste flakes from archaeological sites. Emphasizes appropriate use of typology and methods of debitage analysis. Dual listed with ANTH 5115. *Prerequisites:* ANTH 1300 and 9 additional hours in anthropology.

**4116. Advanced Lithic Analysis. 3.** An in-depth consideration of a single or limited range of topics in lithic analysis, or a group project focused on a case study. Dual listed with ANTH 5116. *Prerequisite:* ANTH 4115.

**4120. North American Archaeology. 3.** Studies North American prehistory from the earliest evidence to historic times. Dual listed with ANTH 5120. *Prerequisite:* ANTH 1300. (Normally offered every third semester)

**4125 [4100]. Northwestern Plains Prehistory. 3.** Northwestern Plains archaeology from the Paleoindian period to historic contact. A review of important sites and artifact types, ongoing UW research projects, regional and other expressions of ideology, Native American ethnohistory and contemporary perspectives, and historic preservation issues. Dual listed with ANTH 5125. *Prerequisite:* ANTH 1300. (Normally offered every third semester)

**4130. Old World Archaeology. 3.** Surveys major archaeological sequences of the Old World. Dual listed with ANTH 5130. *Prerequisite:* ANTH 1300. (Normally offered every third semester)

**4135. Quantitative Methods in Anthropology. 3.** A consideration of the use of quantitative methods in anthropological research, including descriptive and inferential statistics, pattern search, mathematical modeling and computer simulation. Dual listed with ANTH 5135. *Prerequisite:* STAT 2070 or equivalent.

**4140. Archeological Field School. 2-6 (Max. 6).** Summarizes a regional prehistory and gives practical and theoretical training in archaeological field methods. Field projects are

located specific areas of the world (e.g., Wyoming, Croatia, Peru). *Prerequisite:* ANTH 1300 or 4120 or 4125 or 4130 or 4150. (Normally offered summer session)

**4150. Seminar in Prehistory. 1-3 (Max. 9).** Covers the prehistory of a specified region or time period within that region. Emphasizes learning prehistoric sequences, material culture, and research questions associated with the topic. Topics include, but are not limited to, Paleoindian, Archaic, Siberian, Northern Plains, Great Basin, Rocky Mountain, or Southwestern Archaeology. Dual listed with ANTH 5150. *Prerequisite:* ANTH 1300.

**4155. Computer Programming for Archaeologists. 3.** Introduces the application of computer programming to the collection, management, and analysis (hypothesis testing) of archaeological data. Develop models and simulations of complex prehistoric systems. Begins with an introduction to Microsoft Excel (Visual Basic for Applications), programming structure, and applications to archaeology. Specific assignments in writing programs relevant to typical archaeological problems. Dual listed with ANTH 5155. *Prerequisites:* ANTH 1300 or consent of instructor.

**4160. GIS in Anthropology. 4.** Introduction to how and why geographic information systems (GIS) are used in anthropology. Considers: 1) background, definitions, and concepts of geographic data and GIS; 2) Anthropological and archaeological approaches to GIS; and 3) hands-on-experience with GIS applications in archaeology through demonstrations, lectures, and structured inquiries. Dual listed with ANTH 5160. *Prerequisites:* ANTH 1200, or 1300.

**4170. Geoarchaeology. 3.** Introduces students to theory and method in geoarchaeological research. Emphasis is placed upon geomorphical processes of archaeological site formation and paleoenvironmental reconstruction. Dual listed with ANTH 5170. *Prerequisite:* ANTH 1300.

**4190. Public Archaeology. 3.** A consideration of archaeological legislation, policies and regulations; compliance, heritage, and avocational archaeology, cultural resource management; curation; and professional archaeological ethics. Dual listed with 5190.

**4210. Human Osteology. 3.** Provides a detailed study of the human skeleton. Dual listed with ANTH 5210. *Prerequisite:* ANTH 1100, LIFE 2022. (Normally offered spring semester)

**4215 [4200]. Evolution and Hominin Fossils. 3.** Surveys hominin fossil record in context of evolutionary process, stressing

structure-function and the dynamics of adaptive responses. Dual listed with ANTH 5215. *Prerequisite:* ANTH 1100. (Normally offered every third semester)

**4220. Human Variation. 3.** Studies age and sex differences, as well as race as a biological phenomenon. Includes origin and distribution of human races and adaptive significance of racial traits. Dual listed with ANTH 5220. *Prerequisite:* ANTH 1100. (Normally offered every third semester)

**4230. Forensic Anthropology. 3.** Introduces methods and purposes of physical anthropology as applied in human identification for law enforcement agencies. Dual listed with ANTH 5230; cross listed with CRMJ 4230. *Prerequisite:* ANTH 1100. (Normally offered fall semester of odd-numbered years)

**4240. Forensic Anthropology Laboratory. 2.** Studies details of advanced osteometric procedures, particularly as applied to problems of human skeletal identification. Dual listed with ANTH 5240. *Prerequisite:* ANTH 4210. (Offered based on sufficient demand and resources)

**4255. Bioarchaeology. 3.** Study of the human skeleton in archaeological context to reveal the biological and cultural pasts of individuals and communities. Using case studies, covers the history of the field, ethics of working with human remains, theoretical and methodological approaches to mortuary archaeology. Gain hands-on experience by working with specimens from the UWyoming Human Remains Repository. Dual listed with ANTH 5255. *Prerequisites:* ANTH 1100 or 1300.

**4260. Anthropology of Food, Culture, and Nutrition. 3.** Offers a biocultural perspective to the study of diet, nutrition, subsistence, and food systems. Study includes basic nutritional principles and diet seen in evolutionary, cross-cultural, ethnographic, and historical perspective; method and theory in nutritional anthropology; and contemporary issues in nutrition, cuisine, and foodways. Dual Listed with ANTH 5260. *Prerequisites:* ANTH 1100 or 1200.

**4300. Anthropology of Religion. 3.** Provides a comparative anthropological study of religious systems, emphasizing analysis of symbolism, myth and ritual. Dual listed with ANTH 5300. *Prerequisite:* ANTH 1200. (Normally offered every third semester)

**4310. Environmental Anthropology. 3.** Addresses how human societies interact with their surroundings, emphasizing cultural understandings of the environment. Introduces variety of theoretical and methodological approaches to topics ranging from problems of

the American West to global environmental change. Cross listed with ENR 4310. Dual listed with ANTH 5310. *Prerequisite:* ANTH 1200. (Normally offered every third semester)

**4315. Human Behavioral Ecology. 3.** Examines the models and techniques of human behavioral ecology applied to hunter-gatherer societies; covers foraging, demography, life history, division of labor, sharing, and social inequality. Dual listed with ANTH 5315. *Prerequisites:* ANTH 1100, 1200, and 1300.

**4320. Political Anthropology. 3.** Encompasses theories and descriptions of relationships between power and society in both less formal tribal contexts and more highly structured political institutions. Dual listed with ANTH 5320. *Prerequisite:* ANTH 1200. (Normally offered every third semester)

**4325. Symbolic Anthropology. 3.** Teaches several anthropological approaches to symbolic and cultural analysis, while reading ethnographic examples of how symbolic analysis can be used to understand different cultures. Coursework assumes a basic knowledge of social science concepts. Dual listed with ANTH 5325. *Prerequisite:* ANTH 1200 or SOC 1000.

**4330. Social Organization. 3.** Provides theories of social organization, interrelations of social institutions, and current anthropological methods of interpretation. *Prerequisite:* ANTH 1200. (Normally offered every third semester)

**4340. Culture Change. 3.** Examines representative theories of change, factors involved, dynamics of modernization and applied anthropology. Dual listed with ANTH 5340. *Prerequisite:* ANTH 1200. (Normally offered every third semester)

**4350. Medical Anthropology. 3.** Understandings of health and illness vary widely. Taking a comparative historical approach, examines how an individual's interactions with socio-cultural and physical environments influence the experiences of health and illness. Topics include symbolic healing, biomedicine as a cultural system, disease and international development, global politics of AIDS and other pandemics. Dual listed with ANTH 5350. *Prerequisite:* ANTH 1200 or SOC 1000.

**4360. Psychological Anthropology. 3.** Introduces methods and theories anthropologists use to analyze personality, socialization, mental illness and cognition in non-western societies. Dual listed with ANTH 5360. *Prerequisite:* ANTH 1200. (Normally offered every third semester)

**4380. Visual Anthropology. 3.** Offers anthropological interpretation of visual representations and media, including analysis of the development of ethnographic films and their

contemporary use. Visual representations of many cultures as well as mainstream United States examples are analyzed. Dual listed with ANTH 5380. *Prerequisite:* ANTH 1200.

**4740. Native American Languages and Cultures. 3.** Demonstrates the interrelationship of language and culture in several Native American communities. Examines anthropological and linguistic theories regarding language spread and the peopling of North America, narrative performance, translation, and the connection between linguistic structures and cultural features. Dual listed with ANTH 5740; cross listed with AIST 4740. *Prerequisite:* ANTH 2000 or 5760.

**4775. Language and Gender. 3.** Investigates the relationship between language use, linguistic categories, and gender categories. Examines the linguistic practices involved in the formulation, discussion, and performance of gender categories in a number of different cultures. Dual listed with ANTH 5775; cross listed with WMST 4775. *Prerequisite:* ANTH 1200, 2000.

**4785. Language and Racism. 3.** Explores the ways in which racist ideology and socially-based racial categories are reinforced and changed through language and linguistic usage. The forms of language used in the construction of covertly and overtly racist communication, and the media through which racism is communicated also will be investigated. *Prerequisite:* ANTH 1200 or 2000.

**4795. Language Change. 3.** Considers how languages change over time, due to both internal and external forces. The effects of language contact, borrowing, and structural change are discussed. The use of linguistic data for questions of migration and cultural contact are also explored. Dual listed with ANTH 5795. *Prerequisite:* ANTH 2000.

**4970. Internship 1-12 (Max. 12).** Allows students to gain hands-on experience, bridging the gap between anthropology as an academic discipline and anthropology as practiced in museums, public archaeology agencies, non-governmental organizations, and private consulting companies. Involves a required academic component in addition to work experience. Internship credit cannot fulfill requirements of the major. *Prerequisites:* anthropology major of junior/senior standing and consent of internship director and/or department head.

**4975. Undergraduate Practicum in Anthropology. 1-4 (Max. 6).** Affords students the opportunity to extend research projects in field or lab locations and receive additional credit for their work. Students sign up for these

hours only in conjunction with another course and with the instructor's consent. *Prerequisite:* 9 hours in anthropology, consent of instructor.

**5000. Special Problems. 1-4 (Max. 12).** Conference course to allow graduate students opportunity for both guided and independent research. *Prerequisite:* graduate standing and consent of instructor.

**5005. Graduate Seminar in Anthropology. 3 (Max. 6).** *Prerequisite:* graduate standing or consent of instructor.

**5010. 20th Century Anthropology Theory. 3.** Examines major thinkers and schools of thought in anthropology of the 20th century. Emphasis is on cultural theory within the context of the four-field approach. *Prerequisite:* graduate standing in anthropology.

**5015. Archaeological Theory and Method. 3.** Introduces the students to past and present archaeological theories through a literature survey of most significant topics. Addresses questions, such as: How do archaeologists go about identifying and solving problems? What do they perceive to be problems? What is the logic of archaeological arguments? Dual listed with ANTH 4015. *Prerequisite:* ANTH 1200, 1300, 3310, and at least one 4000 regional course.

**5020. Biological Anthropology. 3.** Offers a graduate level overview of biological anthropology. Beginning with the history of relevant areas of human biology, provides extensive discussion of such areas as paleoanthropology, primatology, and human variation. Also includes detailed theoretical examinations of topics within hominid evolution, the concept of race and sociobiology. *Prerequisite:* first year anthropology graduate student standing.

**5030. Linguistic Anthropology. 3.** Demonstrates interrelationships between language, human biology, and culture. In particular, the relevance of the study of language to biological anthropology, archaeology, and cultural anthropology is emphasized. Examines classic approaches in anthropological linguistics and recent controversies such as the origin of language in human evolution.

**5110. Zooarchaeology I. 3.** An introductory level seminar in the archaeological analysis of faunal materials. Emphasis is on the identification and curation of bones from archaeological and Late Pleistocene paleontological contexts, including their use in the interpretation of prehistoric and historic human behavior, the investigation of paleoenvironmental conditions and paleoecological relationships and problem-oriented taphonomic research. Dual listed with ANTH 4110. *Prerequisite:* ANTH 1300.

**5111. Zooarchaeology II. 3.** An advanced level seminar in the archeological analysis of faunal materials. Emphasis is on the study of bones as an integrated component of basic archaeological research, including their use in the investigation of paleoenvironmental conditions and paleoecological relationships as well as problem-oriented taphonomic research, and the interpretation of human behavior. Dual listed ANTH 4111. *Prerequisite:* ANTH 4110/5110.

**5115. Lithic Analysis. 3.** An overview of the analysis of stone tools and waste flakes from archaeological sites. Emphasizes appropriate use of typology and methods of debitage analysis. Dual listed with ANTH 4115. *Prerequisite:* ANTH 1300 and 9 additional hours in anthropology.

**5116. Advanced Lithic Analysis. 3.** An in depth consideration of a single or limited range of topics in lithic analysis, or a group project focused on a case study. Dual listed with ANTH 4116. *Prerequisite:* ANTH 4115.

**5120. North American Archaeology. 3.** Studies North American prehistory from the earliest evidence to historical times. Dual listed with ANTH 4120. *Prerequisite:* ANTH 1300 or consent of instructor.

**5125. Northwestern Plains Prehistory. 3.** Covers the Northwestern Plains from the Paleo-Indian to historic contact, including relationships to surrounding areas. Dual listed with ANTH 4125. *Prerequisite:* ANTH 1300.

**5130. Old World Archaeology. 3.** Survey of the major archaeological sequences of the Old World. Dual listed with ANTH 4130. *Prerequisite:* ANTH 1300.

**5135. Quantitative Methods in Anthropology. 3.** A consideration of the use of quantitative methods in anthropological research, including descriptive and inferential statistics, pattern search, mathematical modeling and computer simulation. Dual listed with ANTH 4135. *Prerequisites:* STAT 2070 or comparable course.

**5150. Seminar in Prehistory. 1-3 (Max 9).** Covers the prehistory of a specified region or time period within that region. emphasizes learning prehistoric sequences, material culture, and research questions associated with the topic. Topics include, but are not limited to, Paleoindian, Archaic, Siberian, Northern Plains, Great Basin, Rocky Mountain, or Southwestern Archaeology. Dual listed with ANTH 4150. *Prerequisite:* ANTH 1300.

**5155. Computer Programming for Archaeologists. 3.** Introduces the application of computer programming to the collection, management, and analysis (hypothesis testing)

of archaeological data. Develop models and simulations of complex prehistoric systems. Begins with an introduction to Microsoft Excel (Visual Basic for Applications), programming structure, and applications to archaeology. Specific assignments in writing programs relevant to typical archaeological problems. Dual listed with ANTH 4155. *Prerequisites:* ANTH 1300 or consent of instructor.

**5160. GIS in Anthropology. 4.** Introduction to how and why geographic information systems (GIS) are used in anthropology. Considers: 1) Background, definitions, and concepts of geographic data and GIS; 2) Anthropological and archaeological approaches to GIS; and 3) Hands-on experience with GIS applications in archaeology through demonstrations, lectures, and structured inquires. Dual listed with ANTH 4160. *Prerequisite:* ANTH 1200 or 1300.

**5165. Advanced Archaeological Research. 3-6 (Max. 6).** Intended for graduate students in archeology which will cover a wide range of topics in advanced research techniques. *Prerequisite:* graduate standing.

**5170. Geoarchaeology. 3.** Introduces students to theory and method in geoarchaeological research. Emphasis is placed upon geomorphological processes of archaeological site formation and paleoenvironmental reconstruction. Dual listed with ANTH 4170. *Prerequisite:* ANTH 1300 or consent of instructor.

**5180. Advanced Archaeological Field Studies. 6.** Covers the entire archaeological process from project planning and budgeting to professional presentation of the results with an emphasis on field methods. Up to date field techniques with electronic data collection and analysis are introduced. Interdisciplinary philosophy is emphasized with lectures, demonstrations and hand-on experience. *Prerequisite:* graduate level students or upper level undergraduates with field school experience and consent of instructor.

**5190. Public Archaeology. 3.** A consideration of archaeological legislation, policies, and regulations; compliance, heritage, and avocational archaeology; cultural resource management; curation; and professional archaeological ethics. Dual listed with ANTH 4190. *Prerequisites:* ANTH 1300.

**5210. Human Osteology. 3.** Provides a detailed study of the human skeleton. Dual listed with ANTH 4210. *Prerequisite:* ANTH 1100, LIFE 2022. (Normally offered spring semester)

**5215 [5200]. Evolution and Hominin Fossils. 3.** Surveys hominin fossil record in context of evolutionary process, stressing structure-function and the dynamics of adap-

tive responses. Dual listed with ANTH 4215. *Prerequisite:* ANTH 1100. (Normally offered every third semester)

**5220. Human Variation. 3.** Studies age and sex differences, as well as race as a biological phenomenon. Includes origin and distribution of human races and the adaptive significance of racial traits. Dual listed with ANTH 4220. *Prerequisite:* ANTH 1100.

**5230. Forensic Anthropology. 3.** Introduces methods and purposes of physical anthropology as applied in human identification for law enforcement agencies. Dual listed with ANTH 4230. *Prerequisite:* ANTH 1100.

**5240. Forensic Anthropology Laboratory. 2.** Studies details of advanced osteometric procedures, particularly as applied to problems of human skeletal identification. Dual listed with ANTH 4240. *Prerequisite:* ANTH 4210.

**5255. Bioarchaeology. 3.** Study of the human skeleton in archaeological context to reveal the biological and cultural pasts of individuals and communities. Using case studies, covers the history of the field, ethics of working with human remains, theoretical and methodological approaches to mortuary archaeology. Gain hands-on experience by working with specimens from the UWyoming Human Remains Repository. Dual listed with ANTH 4255. *Prerequisites:* ANTH 1100 or 1300.

**5260. Anthropology of Food, Culture, and Nutrition. 3.** Offers a biocultural perspective to the study of diet, nutrition, subsistence, and food systems. Study includes basic nutritional principles and diet seen in evolutionary, cross-cultural, ethnographic, and historical perspective; method and theory in nutritional anthropology; and contemporary issues in nutrition, cuisine, and foodways. Dual Listed with ANTH 4260. *Prerequisites:* ANTH 1100 or 1200.

**5300. Anthropology of Religion. 3.** Provides a comparative anthropological study of religious systems emphasizing analysis of symbolism, myth, and ritual. Dual listed with ANTH 4300. *Prerequisite:* ANTH 1200.

**5310. Environmental Anthropology. 3.** Addresses how human societies interact with their surroundings, emphasizing cultural understandings of the environment. Introduces variety of theoretical and methodological approaches to topics ranging from problems of the American West to global environmental change. Cross listed with ENR 5310. Dual listed with ANTH 4310. *Prerequisite:* ANTH 1200.

**5315. Human Behavioral Ecology. 3.** Examines the models and techniques of human behavioral ecology applied to hunter-gatherer

societies; covers foraging, demography, life history, division of labor, sharing, and social inequality. Dual listed with ANTH 4315. *Prerequisite:* ANTH 1100, 1200, and 1300.

**5320. Political Anthropology. 3.** Encompasses theories and descriptions of relationships between power and society in both less formal tribal contexts and more highly structured political institutions.

**5325. Symbolic Anthropology. 3.** Teaches several anthropological approaches to symbolic and cultural analysis, while reading ethnographic examples of how symbolic analysis can be used to understand different cultures. Coursework assumes a basic knowledge of social science concepts. Dual listed with ANTH 4325. *Prerequisite:* ANTH 1200 or SOC 1000.

**5340. Culture Change. 3.** Examines representative theories of change, factors involved, dynamics of modernization and applied anthropology. Dual listed with ANTH 4340. *Prerequisite:* ANTH 1200.

**5350. Medical Anthropology. 3.** Understandings of health and illness vary widely. Taking a comparative historical approach, this class examines how an individual's interactions with sociocultural and physical environments influence the experiences of health and illness. Topics include symbolic healing, biomedicine as a cultural system, disease and international development, and the global politics of AIDS and other pandemics. Dual listed with ANTH 4350. *Prerequisites:* ANTH 1200 or SOC 1000.

**5360. Psychological Anthropology. 3.** Introduces methods and theories anthropologists use to analyze personality, socialization, mental illness and cognition in non-western societies. Dual listed with ANTH 4360. *Prerequisite:* ANTH 1200.

**5380. Visual Anthropology. 3.** Offers anthropological interpretation of visual representations and media, including analysis of the development of ethnographic films and their contemporary use. Visual representations of many cultures as well as mainstream United States examples are analyzed. Dual listed with ANTH 4380. *Prerequisite:* ANTH 1200.

**5390. Field Methods in Cultural Anthropology. 3.** Introduces the graduate student to the research techniques used by cultural anthropologists. Students will conduct their own projects using participant-observation and interviewing. In-class discussion will be drawn on U.S. and international ethnographic examples. *Prerequisite:* graduate standing.

**5720. Advanced Linguistics. 3.** Data are offered for analysis of morphological and syntactic materials from languages throughout the world. Attention is given to the limits within

which these aspects of human language appear to vary. *Prerequisite:* ANTH 4750, ENGL 4750, LANG 4750.

**5730. Field Techniques. 3.** Students work directly with the speaker of an unwritten non-Indo-European language to learn techniques for eliciting the data requisite to begin a description of the language's structure. Identical to LANG 5310. *Prerequisite:* ANTH 5100 or LANG 5300.

**5740. North American Language and Culture. 3.** Demonstrates the interrelationship of language and culture in several Native American communities. Examines anthropological and linguistic theories regarding language spread and the peopling of North America, narrative performance, translation, and the connection between linguistic structures and cultural features. Dual listed with ANTH 4740 and AIST 4740. *Prerequisite:* ANTH 2000 or ANTH 4760.

**5775. Language and Gender. 3.** Investigates the relationship between language use, linguistic categories, and gender categories. Examines the linguistic practices involved in the formulation, discussion, and performance of gender categories in a number of different cultures. Dual listed with ANTH 4775; cross listed with WMST 5775. *Prerequisite:* ANTH 1200, 2000.

**5795. Language Change. 3.** Considers how languages change over time, due to both internal and external forces. The effects of language contact, borrowing, and structural change will be discussed. The use of linguistic data for questions of migration and cultural contact also will be explored. Dual listed with ANTH 4795. *Prerequisites:* ANTH 2000 and ANTH/ENGL/LANG 3750/4750.

**5875. Graduate Practicum. 1-4 (Max. 6).** Affords graduate students the opportunity to extend research projects in field or lab locations and receive additional credit for their work. Students sign up for these hours only in conjunction with another course and with the instructor's consent. *Prerequisite:* graduate standing and consent of instructor.

**5880. Professionalism. 3.** Provides an opportunity for the integration of graduate training and career choice. Examines issues of professionalism in the discipline ranging from ethical conduct to the research process and publication. *Prerequisite:* admission to the doctoral program in anthropology.

**5890. Teaching Anthropology. 3.** Anthropology is increasingly relevant to many audiences. Provides practical insight and examination of controversial anthropological concepts - race, evolution, culture, etc., and how these

may be taught to college or public audience. Also examines the teaching culture of anthropology as a discipline. *Prerequisite:* admission to the doctoral program in anthropology.

**5900. Practicum in College Teaching. 1-3. (Max 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: Credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrolled in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 14).** Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrolled in a graduate level degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

**Art**

110 Visual Arts Building, 766-3269

FAX: (307) 766-5468

Web site: www.uwyo.edu/art

Department Head: Ricki Klages

**Professor:**

**LEAH HARDY**, B.F.A. Kansas University 1987; M.F.A. Indiana University 1990; Professor of Art 2014, 2002.

**RICKI KLAGES**, B.F.A. University of Arizona 1984; M.A. University of New Mexico 1991; M.F.A. 1993; Professor of Art 2003, 1996, 2012.

**MARK RITCHIE**, B.F.A. University of Kansas 1986; M.F.A. Indiana University 1990; Professor of Art 2007, 1995.

**Associate Professors:**

**ASHLEY HOPE CARLISLE**, B.F.A. University of South Mississippi 1997; M.F.A. University of Georgia 2002; Associate Professor of Art 2010, 2003.

**MARGARET HAYDON**, B.F.A. Oberlin College 1977; M.F.A. San Francisco State University 1989; Associate Professor of Art 2008, 2002.

**ELIZABETH HUNT**, B.A. Rhodes College 1993; M.A. University of Missouri-Columbia 1996; Ph.D. 2004; Associate Professor of Art 2013, 2006.

**DOUG RUSSELL**, B.F.A. Columbia College 1990; M.A. University of Iowa 1995; M.F.A. 1996; Associate Professor of Art 2011, 2005.

**Assistant Professors:**

**DIANA BAUMBACH**, B.F.A. Washington University in St. Louis 2003; M.F.A. Southern Illinois University 2007; Assistant Professor of Art 2009, 2012.

**PETER FINE**, B.A. California State University, Chico 1993; M.F.A. University of Arizona 2004; Assistant Professor of Art 2013.

**RACHEL SAILOR**, B.A. Oregon State University 1992; M.A. University of Oregon 1994; Ph.D. University of Iowa 2007; Assistant Professor of Art 2011.

**SHELBY SHADWELL**, B.F.A. Washington University in St. Louis 2003; M.F.A. Southern Illinois University 2007; Assistant Professor of Art 2010, 2012.

**Associate Lecturer:**

**PATRICK KIKUT**, B.F.A. University of Colorado 1990; M.F.A. University of Montana 1994. Assistant Lecturer 2012.

**Assistant Academic Professional Research Scientist**

**DAVID JONES**, B.F.A. University of Tennessee 2000; M.F.A. University of Georgia 2004.

**Assistant Academic Professional Lecturer:**

**BAILEY RUSSELL**, B.A. Princeton University 2001; M.A. New York University 2004.

**Adjunct Faculty:**

**RANI ROBISON**, B.A. University of Utah 1999; M.F.A. University of Oregon 2008.

**MARY KATHERINE SCOTT**, B.F.A. University of Wyoming 2003; M.A. 2005; M.A. Northern Illinois University 2008; Ph.D. Sainsbury Research Unity for the Arts of Africa, Oceania and the Americas University of East Anglia 2012.

**Professors Emeriti:**

Deaderick, Edwards, Evans, Flach, Forrest, Reif, Russin (Distinguished Professor of Art), Schaefer

The department of Art supports the creative, aesthetic and cultural development of students within the university community and serves the cultural and educational needs of the state. The department is dedicated to preparing its graduates to assume leadership positions in their professional lives while maintaining an inner commitment to the aesthetic standards of their chosen discipline.

The department fosters a unique combination of innovation, tradition, aestheticism and practicality, by providing a professional visual arts education built on a strong University Studies Program (USP) foundation.

**Undergraduate Major**

The department offers course work leading to the B.A. and B.F.A. degrees in art. Based on their goals and career plans, students in consultation with a faculty adviser select the appropriate degree plan. Students major in art and declare an emphasis in one or more of the following areas:

- Drawing
- Painting
- Photography
- Printmaking
- Ceramics
- Sculpture
- Metalsmithing

Students may also declare an art major with a concentration in graphic design.

The department also offers course work leading to the B.A. in art history.

<b>University Studies Program (USP)</b>	<b>Hrs.</b>
First-Year Seminar (FYS).....	3
Communication I (COM1).....	3
Communication II (COM2).....	3
Communication III (COM3).....	3
Human Culture (H).....	6
U.S. & Wyoming Constitutions (V).....	3
Quantitative Reasoning (Q).....	3
(test level)	
Physical & Natural World (PN).....	6

<b>College of Arts &amp; Sciences Core Curriculum</b>	<b>Hrs.</b>
U.S. Diversity (ASD).....	3
Global Awareness (ASG).....	3
Upper division requirement.....	42
42 credit hours of 3000-4000 courses.	

**B.F.A. Degree.** The B.F.A. degree program is offered to outstanding students who are prepared for art studies, careers and professional activity beyond the undergraduate level. Up to seventy (70) semester hours are focused

in studio and art history course work, while a minimum of fifty-eight (58) semester hours are reserved for University Studies Program requirements

### Application

Formal application is made to the department for acceptance into the B.F.A. degree program. Favorable faculty review of the application materials and a cumulative 3.25 GPA in course work in the major and university studies are required before a student is declared a candidate for the B.F.A. degree.

- C or better in all art classes
- 3.25 in art major program
- 3.0 overall GPA

Undergraduate majors proceed with meeting the USP requirements for the B.A. in art and balance with foundation, art history, and studio core requirements in the major until formally accepted as a B.F.A. candidate. Application does not automatically guarantee acceptance into the B.F.A. program.

Majors in the process of completing the fourth semester of their Foundations and Studio Core course work (16-19 hours) submit applications materials by February 1st or November 1st of their first semester in the department. Students transferring to the Department of Art who have completed their foundation core and successfully passed portfolio review are eligible to apply for a B.F.A. after one semester in the Department of Art.

**B.A. in Art History.** The Art History major will provide students with a course of study that will provide depth and breadth in the history of art. Students will develop a broad understanding of world art, study the art of western and other global cultures in-depth, and be introduced to the historiography and professional practices related to the field. Closely linked to the Museum Studies minor curriculum, the Art History major would have a strong vocational application.

### Program Requirements

Requirements of the program include:

- 121 hours, including 51 hours within the Art major
- All Art courses must be passed with a letter grade of C or better
- 2.5 GPA within major required
- 2.5 overall GPA
- UW Transfer Art Residency Requirement for transfer of 12 or more art credit hours into department: 26 upper division hours of UW Art courses

### Foundation Core 6 Hrs.

ART 1005 Drawing I.....	3
ART 1110 Design I.....	3
ART 1120 Design II.....	3
ART 1130 Design III.....	3

### Art History Core 9 Hrs.

ART 2010 Survey I <i>required</i> .....	3
ART 2020 Survey II <i>required</i> .....	3
<i>Plus choose from one of the following:</i>	
ART 2700 Intro to Museology.....	3
ART 2030 History of Graphic Design.....	3

### Studio Core 3 Hrs.

ART 1310 Intro to Sculpture.....	3
ART 2005 Drawing II.....	3
ART 2112 Graphic Design.....	3
ART 2210 Painting I.....	3
ART 2255 Intro to Photography, Digital or ART 2265 Intro to Photography, Black and White.....	3
ART 2350 Metalsmithing I.....	3
ART 2410 Ceramics I or ART 2420 Ceramics II.....	3
ART 3510 Printmaking I.....	3

### Upper Division Electives 18 Hrs.

3000 or 4000 level Art History Courses*.....	6-9
ART 4790 Art Seminar <i>required</i> .....	6-9
Other Historical Traditions <i>required</i> .....	3-9

(examples include but are not limited to: Medieval Islamic, Japanese Art and Culture, Meso-American)

\*6 hours of upper division are history may be taken in other departments with cross listed courses (that may have prerequisites other than Art History).

\*Cross listed and applicable courses: Intro to Museology, HIST/ANTH/ART 2700; Victorian Women's Lives, ART/WMST 4830; History of Women Artists, ART/WMST 4780; History of Architecture, ARE 3030; The Harlem Renaissance, AMST 4250; Art and Ecology, AMST/ART 4640; Special Topics in American Studies-including travel courses (as appropriate); Special topics in Classical and Modern Languages-including travel courses (as appropriate); History of the Book, HIST 4070, 4075, 4076, 4077.

### Foreign Language 15 Hrs.

Language 1010.....	4
Language 1020.....	3
Language 2030.....	4
Language 2040.....	3

**B.A. Degree.** The B.A. degree is available to students who are preparing for further studies or careers in the arts and arts-related fields, such as art education, graphic design, art therapy, medical illustration, botanical illustration and forensic illustration. Students work with their academic advisers to select courses from the USP and elective offerings to complement art studies in their areas of

interest. Students must earn a grade of C or better in all courses taken to satisfy department requirements. Courses in the major must be taken for a letter grade. In addition to the university requirement that degree candidates hold a minimum cumulative grade point average of 2.00, degree candidates for the B.A. degree in the Art Department also must have a minimum 2.50 cumulative grade point average and a 2.50 grade point average in Art Department courses at the time of graduation.

### Art/Art Education Concurrent Major.

Through a cooperative agreement between the Art Department and the program of Art Education, all Art Education students will concurrently complete a major in Art. The Art degree requirements are essentially the same as for all other Art majors; however, specialized advising is available to ensure that students select programs that are both efficient and beneficial to their ultimate career goals.

**Transfer Residency.** A minimum of 26 hours of upper-division course work in the major is required to establish residency in the department for all transfer students. This applies to students in the B.F.A., B.A., and Art Education degree programs who transfer in 12 or more hours of art courses for the major. Students in all art programs must meet the university requirement of at least 42 hours of course work at the upper-division level (3000 and above).

**Minimum Course Requirements for Art Majors.** In addition to the university and college requirements listed in this *Catalog*, all students majoring in art must complete the following:

### Foundation Core 15 Hrs.

ART 1005 Drawing I.....	3
ART 1110 Design I.....	3
ART 1115 Digital Media.....	1
ART 1120 Design II.....	3
ART 1130 Design III.....	3
ART 2000 Portfolio Review.....	1
ART 2305 Metal/Plaster.....	1

### Art History Core 9 Hrs.

ART 2010 Survey I.....	3
ART 2020 Survey II.....	3
Advanced Art History Course.....	3

### Studio Core (minimum) 9 Hrs.

ART 1310 Sculpture I.....	3
ART 2005 Drawing II.....	3
ART 2210 Painting I.....	3
ART 2112 Graphic Design.....	3
ART 2255 Photography, Digital.....	3
ART 2265 Photography, Black and White....	3
ART 2410 Ceramics I or.....	3
ART 2420 Ceramics II.....	3

ART 3510 Printmaking .....3  
 ART 2350 Metalsmithing .....3  
**Upper Division Art Electives (minimum)**  
 BA Studio. (3000+).....10  
 BFA Studio. (3000+)..... 12  
 BFA Art History (3000+) .....6

ART 1005, 1110, 1120 and 1130 are considered an important preparation and prerequisite for drawing, painting, printmaking, ceramics, sculpture and graphic design courses and are required freshman courses for the major. Majors must complete the foundation core hours before electing upper-division courses in any studio area. ART 2010, 2020, and 2305 are required sophomore courses.

Once sophomore majors complete course prerequisites, they select a minimum of three courses from the studio core hours. Most of the university and college requirements should be completed as early as possible before the senior year. The department will enforce published prerequisites for courses.

Art majors must submit a portfolio for evaluation before proceeding to intermediate and advanced studios beyond the required studio core. Any student whose portfolio is assessed as deficient must address the deficiencies before receiving permission to advance in the major.

**Please note:** Students who do not pass the portfolio review will be able to resubmit the following semester. However, if students fail more than once, they will be unable to progress in the department of art and may be asked to transfer to another department or UW college or complete an art minor. Portfolio evaluation will occur once in each of the fall, spring, and summer semesters.

**Art Concentrations.** In choosing art electives, students (in consultation with their department adviser) may select from a full range of art course work either broadly based or with concentration in the areas of painting, drawing, printmaking, sculpture, ceramics or graphic design. In the Humanities/Fine Arts Distributed Major degree program. In the B.F.A. degree program, students may declare a concentration in drawing, painting, printmaking, sculpture or ceramics.

**Graphic Design Option.** Graphic designers explore a variety of communication issues that deal with diverse messages and audiences.

Students interested in pursuing a professional career in graphic design and visual communication may elect a required sequence of courses for the B.A. degree in art with a concentration in graphic design. Students

planning to graduate in four years must begin the sequence in the second semester of the freshman year.

**Graphic Design Core**

ART 3110 Typography .....3  
 (Spring only)  
 ART 2112 Graphic Design I.....3  
 (Fall only)  
 ART 2122 Computer Graphics I .....3  
 (Spring only)  
 ART 3120 Graphic Design II.....3  
 (Fall only)  
 ART 4110 Computer Graphics II.....3  
 (Spring only)  
 ART 4120 Senior Projects in Design .....3  
 (Fall only)  
 ART 4400 Internship .....6

**Internships.** Internships are an important aspect of the graphic design concentration. Students in all concentrations may elect internship placements in the slide library, Department of Theatre and Dance or UW Art Museum, or in the appropriate academic or administrative unit across campus. Placements are also available in state and local arts agencies and institutions during the semester and summer. National placements are likewise reviewed and approved.

**Visual Communications Center.** The graphic design/visual communication area provides students with a “human centered” approach to learning that challenges and nurtures them to think conceptually and prepares them to be flexible in an international community that is continually being influenced by new ideas, tools and technology.

The visual communications center is a facility for undergraduate research that functions as a classroom, studio and high-end technology space and incorporates industry standard tools for graphic design, computer graphics and digital art exploration.

**Department Policy.** An art class may require additional meeting times, so that students may fully participate in the Visiting Artist Program and the UWAM lecture series.

As a matter of policy, the art department reserves the right to retain any works created by students it deems worthy for the purposes of exhibition until the end of the academic year.

The art department studios are the primary instructional classrooms. As a matter of policy, access to the studios and use of the equipment is reserved for students who are formally registered for scheduled courses and are following a prescribed curriculum.

**Scholarships.** The department has several scholarships for qualified students at all stages in the program. See Department of Art for a full list of scholarships.

**Academic and Career Advisement.** Faculty advisers work closely with art students to guide and direct their progress through the declared degree program and course of study. Through the visiting Artist Program, the UW Art Museum and internship placements, the department provides numerous opportunities and role models for a professional life in the visual arts. Through consultation and discussion with faculty advisers, art students consider their interests and abilities in relation to the many and varied careers in the arts and art related fields. Many graduates go directly into industry, on to pursue graduate studies or take the next step in their career plan. On a competitive basis upon graduation, majors may participate in the Post Bac Program where they prepare a portfolio for graduate school and gain additional experience in the studio and the classroom setting.

**Graphic Design, Museum Studies, Studio, Art History Minors**

A minor is offered in graphic design, museum studies, all studio areas and in art history. Further information may be found on the department’s web site.

**Graduate Study**

At present, no program for a graduate degree in art is offered; however, some courses at the 4000 level may be counted at the graduate level in other degree programs.

**Art (ART)**

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◆Q]).**

**1005. Drawing I. 3.** A foundation level drawing course introducing fundamentals of observation, artistic invention, and basic principles of perspective and composition through problems in still life, landscape, and live model. Lectures, drawing sessions, and critiques develop formal, conceptual, and technical understanding of the drawing process.

**1101. First-Year Seminar. 3. [(none)◆FYS]**

**1110. Foundation: Two Dimensional. 3.** First in a sequence of three foundation courses that investigate the fundamentals of design. Basic aesthetic/formal concepts and conceptual approaches are covered through a variety of two-dimensional mediums. Structured



critiques are employed to provide students the experience of assessing formal, conceptual, and technical aspects of art.

**1115. Digital Media. 1.** An introductory level course designed to investigate the role of digital media in visual literacy. Students gain practice with basic graphics software, explore using the Internet in informing the development of art work, and discuss how application of these skills are used in classroom, studio, and commercial art fields.

**1120. Foundation: Three Dimensional. 3.** Second in a sequence of three foundation courses that investigate the fundamentals of design. Basic aesthetic/formal concepts and conceptual approaches are covered through a variety of three-dimensional mediums. Structural form is emphasized in various contextual settings. Structured critiques are employed to provide students in the experience of assessing formal, conceptual, and technical aspects of art.

**1130. Foundation: Color Theory. 3.** Third in a sequence of three foundation courses that investigate the fundamentals of design. Explores color theories based on the color wheel/light spectrum including hue, value, chroma, and aesthetic color relationships. Optical color, emotional/psychological color, and color symbolism are also covered. Structured critiques are employed to provide students the experience of assessing formal, conceptual, and technical aspects of art. (Offered based on sufficient demand and resources)

**1310. Introduction to Sculpture. 3.** Introduces fundamentals of sculpture as a process of three-dimensional expression. Students explore various media, techniques and concepts through a series of assigned and open projects. Emphasis on traditional methods and formal abstract elements of sculpture are encouraged, leading to an understanding of both classic and modern concepts of form. *Prerequisite:* ART 1110, 1120.

**2000. Portfolio Review. 1.** One-semester course in which work is created for a portfolio review at midterm based on the content and principles learned in the foundation core classes. *Prerequisites:* successful completion of ART 1005, 1110, 1120, and 1130, and a UW GPA of 2.5 or above.

**2002. Special Topics In.: 3 (Max. 6).** Permits utilization of unusual faculty expertise and provides highly-specialized and particularly pertinent, timely subject matter. *Prerequisite:* ART 1005; ART 1130; sophomore standing.

**2005. Drawing II. 3.** An intermediate level drawing course building upon fundamentals of observation, artistic invention, perspective and composition through problems in still life,

landscape, explorations in wet and dry media, and color with pastels. Lectures, drawing sessions, and critiques develop formal, conceptual, expressive and technical understanding. *Prerequisite:* ART 1005.

**2010. Art History I. 3. [CA◀▶H]** First semester of a one-year survey. Studies ancient, medieval, renaissance and modern art with special reference to various social, economic and historic factors which motivated and conditioned the aesthetic forms. Includes ancient, medieval and early renaissance periods. ART 2010 and 2020 are required of all art majors and should be taken in sequence.

**2020. Art History II. 3. [CA◀▶H]** Second semester of a one-year survey. Studies European/American Art from the Renaissance through Contemporary with special emphasis and historical factors which motivated and conditioned the aesthetic forms. Covers Renaissance, Baroque, Rococo, 18th Century, 19th Century, Early Modernism and Contemporary Art. ART 2010 and 2020 are required of art majors and should be taken in sequence.

**2030. History of Graphic Design. 3.** History of graphic language and evolution of graphic communication. Includes an extensive examination of the social forces that shaped the design profession and how in turn design has shaped society. The theories that moved designers to act to remake society are also considered.

**2112 [2120]. Graphic Design. 3 (Max. 6).** Explores techniques of graphic design preparation from concept through paste-up to the printed page, both on and off the computer. Problems include stationery, brochures, posters and corporate images. Graphic design history is referenced and researched. *Prerequisites:* ART 1110 and ART 1115. (Offered fall semester)

**2122 [3110]. Computer Graphics. 3 (Max. 9).** Develops hands-on understanding of how visual elements and text are created and manipulated on current graphic design software programs used in the field. Explores techniques of basic graphic design preparation on the computer. Problems are given in various software applications. Uses graphic design problems as technical examples of production. Laboratory/lecture. *Prerequisite:* ART 2112. (Normally offered spring semester)

**2210. Painting I. 3.** Introduces problems in painting, developing skill, techniques and concepts. *Prerequisite:* ART 1005, 1110, and 1130; ART 1120 may be taken concurrently. (Offered fall and spring semesters)

**2255. Introduction to Photography, Digital. 3.** Fundamentals of Digital and Color photography. Students will learn how to use their

digital cameras, how to input images to Photoshop and out put them to prints. The class will begin with an investigation of techniques before moving through a series of assignments designed to develop the understanding of how to compose a body of work around a specific theme or concept. Lectures will work through the concepts and history of color photography and regular critiques will guide students towards creating a final portfolio of images. *Prerequisites:* ART 1110, ART 1130.

**2265. Introduction to Photography, Black and White. 3.** Fundamentals of Black and White film photography, including use of SLR cameras, how to correctly expose film, process it and create prints in the darkroom. The class will begin with an investigation of techniques before moving through a series of assignments designed to develop the understanding of how to compose a body of work around a specific theme or concept. Lectures will work through the concepts and history of Black and White photography and regular critiques will guide students towards creating a final portfolio of images. *Prerequisites:* ART 1110, ART 1130.

**2305. Techniques: Wood/Art Preparation. 1.** Art Tech 2305 covers two curricular units, one in which students are introduced to the processes, equipment, hand tools, materials, and necessary safety procedures related to the art department woodshop. In the other unit in this course, students are taught art preparation techniques which they will encounter both as a student and professional. Offered satisfactory/unsatisfactory only.

**2350. Metalsmithing I. 3.** Introduces basic technical approaches to fabricating small scale, non-ferrous metals (silver, copper, brass, nickel) including sawing, soldering, filing, drilling, form raising/pressing, texturing, and finishing processes. Investigation into the rich history of metalsmithing as well as innovative contemporary applications – sculpture and as body ornamentation – is fostered. A variety of individual projects in a studio environment alone with critical discussion and presentation addresses aesthetic, conceptual and technical aspects of metalsmithing. *Prerequisite:* ART 1120.

**2410. Ceramics I. 3.** Introduces ideas about ceramic form through various handbuilding construction techniques. Emphasizes design and conceptual development. Includes glaze application, surface decoration and kiln operation.

**2420. Ceramics II. 3.** Introduces ideas about ceramic form through wheel-throwing techniques. Emphasizes design and conceptual development. Includes glaze testing, glaze

application, surface decoration and kiln operation. (Normally offered fall and spring semester)

**2430. Combined Clay Methods. 3.** A basic course in ceramics designed to introduce handbuilding and wheel throwing in one semester. The emphasis will be on developing an understanding of basic clay forming methods; developing surface treatments including slip, glaze and stains with an emphasis on low fire techniques, and understanding electric kiln firing and operation.

**2700. Introduction to Museology. 3. [CH♦(none)]** Explores the historical, cultural, and contemporary roles of museums and preservation institutions in society. Introduces students to the museum professions, collection and exhibition installation strategies, and ethical problems of governance and collection. Field trips to regional collections are included. Cross listed with AMST/ANTH/HIST 2700. *Prerequisite:* WA.

**2730. African Creativity and Ritual. 3. [CA,G♦(none)]** In a thematic organization, explores both North African and sub-Saharan cultures, incorporating issues pertinent to art history, African American studies, anthropology, religious studies and women's studies. Looks at music, dance, body language, festival, celebration, coming of age rituals, fertility rites, harvest and funerals. Cross listed with AAST/ANTH 2730.

**3002. Special Topics In: 3.** Courses of broad general appeal will be offered from time to time under this title. Permits utilization of unusual faculty expertise and provides highly-specialized and particularly pertinent, timely subject matter. See current class schedule for topics. *Prerequisites:* ART 2010, Art History I and ART 2020, Art History II.

**3005. Drawing III. 3.** An advanced drawing course applying the fundamentals of drawing to creative individual problems in figure, still life, and/or landscape composition. Structured yet open assignments, lectures and critiques develop formal, conceptual, expressive, and technical understanding. Course may be repeated for a maximum of 6 credit hours. *Prerequisite:* ART 2000 and 2005. (Offered spring semester).

**3052. Life Drawing I. 3.** An advanced drawing course working from a life model with an emphasis on composition, monochromatic media, drawing techniques and the skeletal and muscular construction as related to action and proportion in the human figure. Lectures, drawing sessions, and critiques develop formal, conceptual, and technical understanding. *Prerequisite:* ART 2000 and 2005. (Normally offered fall semester)

**3112 [2110]. Typography. 3.** Examines the use of type, its history, structure and background in reference to the field of graphic design. Closely examines the relationship between typographical layout, concept and expression. *Prerequisites:* ART 2000 and ART 2112. (Offered spring semester)

**3120. Graphic Design II. 3.** Studies advanced graphic design preparation, idea generation, conceptualization, and critical thinking, from paste-up through production. All work is executed both on and off the computer. Design problems include print and packaging design. *Prerequisite:* ART 2000 and 3112. (Offered fall semester)

**3140. Print Production. 3.** Explore the methods, vocabulary, and processes of commercial printing, including: the production and design process, color(ink) selection, duotones, paper selection, photography, diecutting, mailers & mailing regulations, finishing, pre-flighting and pre-press preparation, and communication with the printer. Projects will be focused around solving real-world printing problems. *Prerequisites:* ART 2000, 2122, ART 3112, ART 3120 or concurrent enrollment.

**3180. Graphic Design III. 3.** Studies specialized and advanced graphic design preparation, idea generation, conceptualization, and critical thinking, from paste-up through production. All work is executed both on and off the computer. Design problems include print and packaging design. History of graphic design and advanced production methods are discussed. *Prerequisites:* ART 2000, 3120, ART 3140.

**3210. Painting II. 3 (Max. 6).** Investigates various painting techniques to create individual work. Emphasizes contemporary and classical treatment of formal, aesthetic and conceptual creative expression. *Prerequisite:* ART 2000 and 2210.

**3250. Watercolor Painting I. 3.** Investigates watercolor techniques in the development of creative work. Discussion, application and criticism of contemporary ideas about structure, form and color constitute the main activity. *Prerequisites:* ART 1130, 2000 and ART 2210. (Offered based on sufficient demand and resources)

**3260. Illustration I. 3.** This is an introductory Illustration course. This primary class objective is to develop conceptual skills through a variety of media traditionally used in fine art illustration and a variety of illustration problems and projects. This class is designed to further your interest in illustration and initiate portfolio development. *Prerequisite:* ART 2000.

**3265. Intermediate Photography. 3.** Focuses on the production of a fully realized portfolio of images. Students will be guided with a set of

conceptual projects towards exploring technical boundaries and potential of photography. Research and readings will lead towards the production of a finished and installed body of work. *Prerequisites:* ART 2255 and ART 2265.

**3310. Sculpture: Cast Form I. 3 (Max. 6).** Studies of casting processes in sculpture dealing with cold-casting: paper/fabric casting, and resin; metal casting, both non-ferrous and ferrous. Covers wide variety of mold-making techniques, as well as the traditional "lost wax" process, and will focus on finished presentation. Intensive inquiries into ideas of classic and contemporary sculpture are discussed as they relate to casting, as well as advanced research into student idea generation. *Prerequisite:* ART 1110, 1120, 1130, 1310 and 2000. (Offered fall semester)

**3320. Sculpture: Mixed Media I. 3 (Max. 6).** Studies use of the "found object" as a basic medium for three-dimensional expression. Includes additive processes, as well as discussing the history of the found object, and research focusing on mixed media artists. Processes include cold connection investigation, as well as hot fabrication-welding and forging. *Prerequisite:* ART 1110, 1120, 1130, 1310, and 2000. (Normally offered fall semester of every other year)

**3330. Sculpture: Assembled Form I. 3 (Max. 6).** Investigates constructed and assembled form as an essential means of sculptural expression. Emphasizes wood construction, assembled metals and mixed media. Utilizes general carpentry techniques, a variety of welding methods (oxyacetylene, arc, M.I.G. and T.I.G.) and other means of assembling materials. Includes investigation of concepts in assemblage and exposure to classic and contemporary forms of assembled sculpture. *Prerequisite:* ART 1110, 1120, 1130, 1310 and 2000. (Offered spring semester)

**3345. Special Topics in Sculpture. 3 (Max. 9).** Address specific areas of concern relevant to contemporary sculpture practice such as: Installation, Video/Sound manipulation, Kinetic Sculpture, Figurative Modeling, and Fabric/Fiber Fabrication. Assigned projects and research specific to the area of study will engage students in the production of artwork related to the topic. Extensive journal/sketchbook, artist research, and critique participation is required. *Prerequisite:* ART 2000.

**3350. Metalsmithing II. 3.** Introduces intermediate approaches to fabricating small scale, non-ferrous metals including etching, raised forms and silver casting. Historical and innovative contemporary applications – sculptural and body ornamentation-based – is fostered. Individual studio projects along with critical

discussion and presentations address aesthetic, conceptual, and technical aspects of metal-smithing. *Prerequisite:* ART 2000 and 2350.

**3410. Advanced Ceramics I. 3.** Studies development of ceramic form involving work in handbuilding and wheel techniques. Introduces surface treatment and glaze testing. Emphasizes design and conceptual development. Includes historical research. First semester of a one-year sequence. *Prerequisite:* completion of Foundation Core, ART 2000, ART 2410, ART 2420 and consent of instructor based on portfolio review. (Offered based on sufficient demand and resources)

**3420. Advanced Ceramics II. 3.** Studies development of ceramic form involving work in handbuilding and wheel techniques. Introduction to surface treatment and glaze testing. Emphasizes design and conceptual development. Includes historical research. Second semester of a one-year sequence. *Prerequisites:* completion of Foundation Core, ART 2000, 2410, 2420, and consent of instructor based on portfolio review. (Offered based on sufficient demand and resources)

**3500. Book Arts. 3.** Introduction to the history of the book as an object and the traditional crafts associated with book construction through the exploration of the book as a vehicle for artistic expression. A basic knowledge of technical processes pertaining to book construction, a general familiarity with the history of the book and a conceptual exploration of image making will be gained through demonstrations, hands-on studio work, slide lectures, visits to the museum and archives and through assigned readings. *Prerequisite:* ART 2000 and completion of WB or junior standing.

**3510. Printmaking I. 3.** Investigates and experiments with processes and properties of print media, including intaglio, lithography and relief. Explores ideas and works of traditional and contemporary printmaking. *Prerequisite:* ART 1005 and ART 1110 and 1130 or concurrent registration in ART 1130.

**3710. Gender: Humanities Focus. 3. [CH♦COM2]** Explores how men and women are imaged differently, studying the influence of representation on gender (including representations in literature, film, art, popular culture, and/or performance). Sharpens students' ability to analyze texts and images and investigate those texts' messages about gender, sexuality, ethnicity and class. Cross listed with ENGL/WMST 3710. *Prerequisite:* WMST 1080 or ENGL 1010. (Offered once a year)

**3720 [2720] Art and Architecture of Medieval Islam. 3.** Studies the art and architecture produced by Islamic societies from the time

of the Prophet Mohammed to the time of the Crusades (7th-14th centuries CE), and the geographic scope surrounds the Mediterranean Sea, including the Near Middle East, northern Africa, and Spain. *Prerequisites:* USP WA and WB courses.

**3760. American Art History. 3.** Addresses American art within the continental United States from first European encounters with the New World to 1900. Will investigate painting, sculpture, and architecture, but will also include some photography, prints, and the decorative arts. *Prerequisites:* ART 2020.

**4000. Post Baccalaureate Seminar. 1.** Enhance and formalize the Post Baccalaureate experience while creating a creative community across artistic disciplines. Students will read and respond to relevant text, discuss pedagogical concerns, critique their creative research, and develop a professional dossier in support of their future career goals. *Prerequisites:* Completion of all BA/BFA degree requirements and acceptance into the Department of Art Post Baccalaureate program.

**4005. Drawing IV. 3.** An advanced drawing course exploring conceptual, expressive, personal and technical limits of process and media. Individually proposed projects lead to a coherent body of work. Open discussion and structured critiques develop personal and technical understanding. Repeatable for a maximum of 9 credit hours. *Prerequisite:* ART 2000 and 3005.

**4010 [4610]. Contemporary Art: Theory and Practice. 3 (Max. 6). [(none)♦COM3]** Taught from the perspective of a studio artist, this course enables students to situate their art within a theoretical context. Students examine how issues in contemporary art relate to philosophical concerns through reading, discussion, and critique. Emphasis is placed on an interdisciplinary framework through which students can discuss their work. *Prerequisites:* ART 2000, junior standing.

**4050. Advanced Drawing. 3.** Advanced investigation of various drawing techniques are used to create individual work. Studies contemporary and classical treatment of line, composition and concepts using experimental and traditional treatment of drawing surface and materials. *Prerequisite:* ART 2000 and 3005. (Normally offered spring semester)

**4052. Life Drawing II. 3.** An advanced drawing course building upon figure construction fundamentals with heavy emphasis on composition, personal expression, wet and dry media, and color with pastels. Lectures, drawing sessions and critiques develop formal, conceptual, expressive and technical understanding. May

be repeated for a maximum 9 credit hours. *Prerequisite:* ART 2000 and 3052 (Normally offered spring semester)

**4110. Computer Graphics II. 3.** Advanced work on current computer graphic design software. Presents graphic design problems to augment working knowledge of the programs. Lab/lecture. Second course in a two semester sequence. *Prerequisite:* ART 2000 and 3120. (Normally offered spring semester)

**4120. Senior Portfolio. 3 (Max. 6).** Specialized research for the advanced graphic design student who will develop a mature style and sense of design. Problems include print, packaging, and multimedia design while also studying preparation techniques for job applications and professional skills. *Prerequisite:* ART 2000 and 4110. (Normally offered fall semester)

**4140. Professional Development in Graphic Design. 3.** Explore the methods, vocabulary, and processes of professional development in graphic design including: portfolio production, creation of personal business forms, job searching, interviewing, networking, and personal portfolio website development. Projects are focused around solving one's own real-world graphic design professional problems. *Prerequisite:* ART 2000 and 4120.

**4210. Painting III. 3 (Max. 6).** Advanced investigation of various painting techniques are used to create individual works. Studies contemporary and classical treatment of form. Aesthetic and conceptual creative expression. Students work from a proposed course of study and will be self-directed. *Prerequisites:* ART 2000 and 3210.

**4250. Watercolor Painting II. 3.** Advanced investigation of watercolor techniques in the development of creative work. Discussion, application and criticism of contemporary ideas about structure, form and color constitute the main activity. *Prerequisite:* ART 2000 and 3250. (Offered based on sufficient demand and resources)

**4260. Illustration II. 3.** This is the second level Illustration course for students who have had ART 3350. Students will continue to develop conceptual skill in creating narrative illustrations for a variety of projects. The majority of the semester will be dedicated to developing a single project: Graphic Novelization or book illustrations. Students will be focusing on character development, narrative arc, and compelling imagery using materials appropriate for their project. *Prerequisite:* ART 3350.

**4265. Photography III. 3.** An advanced photography class focusing on the production of a fully realized portfolio of images. Students interests will help shape a course dedicated to

providing them with additional technical tools (traditional printing techniques, high level photoshop tools) and readings and discussions designed to push them beyond the comfortable boundaries of their photographic world. *Prerequisites:* ART 2000, ART 3265.

**4310 [5310]. Sculpture: Cast Form II. 3 (Max. 6).** Advanced exploration of various problems and themes of contemporary sculpture, focusing on the experimental development of personal vision, concepts, and style. Work produced for class is examined in light of historical and recent antecedents through slide discussions, critical reviews, and research projects. Students choose from a wide variety of materials and processes, with emphasis on a cold and hot casting. For students with professional motivation and commitment. *Prerequisite:* ART 2000, 6 hours of 2nd level sculpture and portfolio review by instructor. (Offered based on sufficient demand and resources)

**4330. Sculpture: Assembled Form II. 3 (Max. 6).** An advanced investigation in constructed and assembled forms as an essential means of sculptural expression. Focus is on the experimental development of personal vision, concepts, and style using fabrication methods in wood, metal, and found object manipulation. Work produced for class is examined in light of historical and recent antecedents through slide discussions, critical reviews and research projects. For students with professional motivation and commitment. *Prerequisites:* ART 2000, 6 hours of Sculpture courses including ART 3330 and portfolio approved by instructor.

**4355. Metalsmithing III. 3.** Introduces advanced fabrication and surface techniques which build on skills developed in Metalsmithing I and II. Students propose a body of work for the semester based on individual aesthetic, conceptual and technical interests. Professional practices including resume writing, documenting, presenting and exhibiting artwork are addressed at this advanced level. *Prerequisite:* ART 2000 and 3350.

**4360. Metalsmithing: Special Topics. 3 (Max 9).** Focus is on specific techniques in the field of Metalsmithing for the semester's duration to allow for an in-depth exploration rotating between topics such as Grandulation, Sliver Clay, Silver Casting, and Cold Connections/Mechanisms. Assigned projects complement students' proposed body of sculptural or body ornamentation-based work. *Prerequisite:* ART 2000 and 2350.

**4400. Internship. 1-3 (Max. 9).** Allows students to bridge the gap between theoretical problems solved in the classroom and the real work world. Students are placed in a setting

where they perform duties similar to a working environment. Specific arrangements are made through the major area adviser. Students are evaluated at mid-term and finals. Minimum of three contact hours of internship per week for a semester equals an hour course credit. *Prerequisite:* ART 2000 and 12 hours in the major area. (Normally offered fall, spring and summer)

**4410. Ceramics Workshop I. 3.** Studies and develops traditional and experimental forms. Applies wide range of three-dimensional decorative and conceptual approaches. Studio work is independently based on an individually directed theme of exploration. Historical and technical research. First semester of a one-year sequence. *Prerequisite:* ART 2000 and 6 hours of ART 3320, 3410. (Offered fall semester of every other year)

**4420. Ceramics Workshop II. 3.** Continued study and development of traditional and experimental forms. Applies wide range of three-dimensional decorative and conceptual approaches. Studio work is independently based on an individually directed theme of exploration. Historical and technical research. Second semester of a one-year sequence. *Prerequisite:* ART 2000 and 4410. (Offered spring semester of every other year)

**4430. Lo-Tech Ceramics. 3.** Explores elementary forming, decorating and firing processes developed by various pottery cultures. Examines basic geology, clay prospecting, kiln design and construction. Includes historical overview and contemporary work survey. Dual listed with ART 5430. *Prerequisite:* ART 2000 and 12 hours of humanities/GED/USP. (Offered based on sufficient demand and resources)

**4510. Printmaking II. 3 (Max. 6).** Continues development of printmaking skills gained in introductory printmaking and focuses in particular on the relationship between process and image. Through demonstrations and studio work, slide lectures, visits to the museum and archives, and readings and discussions, technical processes will be refined, print history will be further explored and image making will continue to be developed. *Prerequisite:* completion of Foundation Core, ART 2000 and 3510.

**4520. Advanced Printmaking II : Exhibition and Professional Preparation. 3 (Max. 6).** Preparation to continue as exhibiting artists. Students further develop their work as artist-printmakers in preparation for a solo or two-person exhibition at the completion of the semester. Presentation and execution of slides, resume, artist statement, locating opportunities and correspondence will be developed throughout the term. *Prerequisites:* ART 2000, 4510 and portfolio approval from instructor.

**4600. Professional Practices and Strategies. 3 (Max. 6).** [(none)◀COM3] This course offers information to junior/ senior level art majors in regards to: finding jobs in art, finding/applying for exhibition opportunities, applying/finding grant opportunities, furthering education including finding/applying for a Masters in art, and overall life possibilities after the completion of an undergraduate art degree. Writing is expected in the form of cover letters, resumes, artist statements, and project proposals. *Prerequisites:* 6 hours in Art and junior standing.

**4620. Problems in Art. 1-3 (Max. 6).** Special, current studio problems for advanced students. *Prerequisite:* 6 hours in art. (Offered based on sufficient demand and resources)

**4635. Preparation for International Study in Art. 1.** An introductory course to international study in art. Specifically focusing on various issues of culture, language, history, art and archeology the student may encounter while traveling abroad. Also provides time for the coordination of practical issues of travel, necessary documentation and insurance. Issues specific to the country of travel will also be addressed. *Prerequisites:* 6 hours in Art, WA, junior standing.

**4640. Art and Ecology. 3.** Focuses on the intersection of contemporary art with ecological concerns. Readings present philosophical, historical and cultural aspects of the art/ecology relationship; students reflect and question their own beliefs. Examples of art/artists are reviewed as well as how ecological artwork is developed. Students propose solutions and/or create art in, out of, or about the environment; local sites are encouraged. *Prerequisite:* 6 hours of art and/or American studies.

**4650. International Study of Art. 3. [G▶(none)]** Students will respond creatively to the historical, cultural and aesthetic experience in the country of travel and will use journaling, drawing, and collection of visual material to continue a more in-depth response upon return. Course sections will vary regarding structure/context. All sections will include studio and/or art historical curriculum. *Prerequisite:* ART 4635.

**4670. Completion International Study in Art. 1.** A completion course to international study in art. Students will compile and complete their response to their experiences encountered in the culture, language, history, art and archeology while traveling abroad. Concise structured critiques will provide time for discussion and digestion of their individual and shared experiences. When possible an

exhibition of creative work will be included as a culmination of the program. *Prerequisite:* ART 4650.

**4710. Art of the Medieval World. 3.** Studies unique qualities of art of this intriguing era of transition between classical and renaissance times. Dual listed with ART 5710. *Prerequisite:* ART 1010 or 2010. (Normally offered fall semester of every other year)

**4720. 15th Century Renaissance Art. 3.** Explores artistic developments of the 15th century, primarily in Italy, in order to appreciate the relationships between artistic production and innovation and other aspects of the social and cultural environment. *Prerequisite:* ART 2010, 2020. (Normally offered spring semester)

**4730. 19th Century European Art. 3.** Studies 19<sup>th</sup>-century European painting, prints, and literature, covering Neoclassicism, Romanticism, Realism, Impressionism, and Post-Impressionism. Artists include Elisabeth Vigee-Lebrun, court portraitist; Mary Cassatt and Edgar Degas, famed Impressionists; Edouard Manet, controversial and troubled; Honore Daumier, jailed for incendiary political cartooning; and the eccentric Paul Gauguin and Vincent Van Gogh. *Prerequisite:* ART 2020. (Normally offered fall semester)

**4740. 20th Century European Art. 3.** Studies 20<sup>th</sup>-century European art from 1900 to 1945. Covers the 2-D and 3-D art of Expressionism, Cubism, the Bauhaus, Dada and Surrealism, and other important movements in the first half of the 20<sup>th</sup> century. *Prerequisites:* ART 2010 and 2020. (Normally offered spring semester)

**4760. American Art in the 20th Century. 3.** Studies 2-D and 3-D art in 20<sup>th</sup>-century America. Topics will include art of the Gilded Age, the Jazz Age, the Progressive Era, the Great Depression, the World Wars, etc. Styles include American Impressionism, the Ashcan School, American Modernism, Social Realism, the Harlem Renaissance, Regionalism, Abstract Expressionism, and more. *Prerequisites:* ART 2010 and 2020. (Normally offered spring semester of every other year)

**4770. Contemporary Arts Seminar. 3 (Max. 9).** Studies the major movements in the visual arts from 1945 to the present. Investigate major theories, stylistic movements, and key artists since WWII with a special focus on the increasing globalization of art during this era. *Prerequisites:* ART 2010 and 2020. (Normally offered fall semester of every other year)

**4780. History of Women Artists. 3.** Studies documented influence of women as subjects, makers and receivers of art. Emphasizes careers and works of women over a wide range of times and places and under a variety of social

circumstances. Greatly emphasizes developments in the 20th century. Cross listed with WMST 4780. *Prerequisite:* ART 2010 or ART 2020 or 3 hours of WMST courses; and WB. (Normally offered fall semester)

**4790. Art Seminar. 1-3 (Max. 9).** [(none)◀COM3] Special topic in art history and criticism for advanced students. *Prerequisite:* 6 hours in art history. (Offered based on sufficient demand and resources)

**4830. Victorian Women's Lives: Their Art, Literature and Culture. [CA◀(none)]** Interdisciplinary approach to study of women's issues in art. Uses literary/cultural texts to reinforce/contradict and/or expand/enlarge the art historical basis. Topics include domestic goddess, working women, prostitution, education, marriage and divorce. Cross listed with ENGL/WMST 4830. *Prerequisite:* Either ART 2020 or WMST/ENGL 1080. (Normally offered every sixth semester)

**4975. Independent Study and Research. 1-3 (Max. 6).** Research options in all creative areas. Students work independently and provide demonstrated ability and background knowledge to carry out self-directed research or creative activity in the research area. Arrangements regarding curricular obligations and meeting times are made with the instructor in advance. *Prerequisites:* ART 2000 and 12 hours of art in research area and prior consent of instructor. (Offered fall, spring and summer)

**5430. Lo-Tech Ceramics. 3.** Exploration of elementary forming, decorating, firing processes developed by various pottery cultures. Examination of basic geology, clay prospecting, kiln design and construction. Includes historical overview and contemporary survey. Dual listed with ART 4430. *Prerequisite:* 12 hours of humanities/GED/USP.

**5650. Art and Ideas. 3.** Students in this seminar explore the literatures of art. Each seminar has a reading list and a thematic structure. Major critical papers are written during the course of the seminar. Required for M.A. and M.A.T. program Plan B option. *Prerequisite:* 30 hours in art.

**5660. Investigations in Art. 1-5 (Max. 10).** Research options in all the creative areas. The graduate student is expected to work independently and should provide demonstrated ability and background knowledge to carry out self-directed research or creative activity in the area to be studied. Arrangements regarding curricular obligations and meeting times must be contracted with the instructor in advance of enrollment. *Prerequisite:* completion of all 5000-level course work in the area of investigation.

**5670. Term Creative Project. 1-5 (Max. 15).** For M.F.A. candidates only; professional creative achievement in painting, drawing, printmaking, ceramics, or sculpture, leading to presentation of graduate exhibition. Typically, student will consult a single professor in major area for crediting this course. *Prerequisite:* admission to candidacy for M.F.A. degree and consent of instructor.

**5710. Medieval Art. 3.** Studies the unique qualities of art of this intriguing era of transition between classical and renaissance times. Dual listed with ART 4710. *Prerequisite:* ART 1010, 2010.

**5740. 20th Century European Art. 3.** Studies European art from 1900 to present. Dual listed with ART 4740. *Prerequisite:* ART 2010 and 2020, consent of instructor.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrolled in a graduate degree program.

**5990. Internship. 1-12. (Max 24).** *Prerequisite:* graduate standing.

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## Astronomy and Astrophysics

The Bachelor of Science degree in astronomy and astrophysics is administered by the Department of Physics and Astronomy faculty. Please see the Physics and Astronomy listing in this *Catalog* for more information.

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## Biology

### Biology Degree

The Bachelor of Science degree in Biology is designed to provide a thorough foundation in biology and other supporting areas of science and mathematics, while providing maximum flexibility and student choice. The degree program is administered by the Department of

Botany. Upon completion of the core requirements for the major (see list at [www.uwyo.edu/biology](http://www.uwyo.edu/biology)), specific courses to complete the major will vary according to a student's interests and career plans and may be selected from a variety of departments on campus in consultation with a student's faculty adviser.

**Department of Botany, 3165  
114 Aven Nelson Building, 766-2380**

**FAX:** (307) 766-2851

**Web site:** [www.uwyo.edu/botany](http://www.uwyo.edu/botany)

#### *Freshman and Sophomore Years*

Students take introductory courses in biology, chemistry, physics, and mathematics. These courses provide the foundation for more advanced work in upper division biology courses and contribute to a more comprehensive understanding of biological processes.

#### *Junior Year*

Students take courses in genetics, ecology, evolution and statistics. Students should consult the biology degree web site for the list of requirements ([www.uwyo.edu/biology](http://www.uwyo.edu/biology)) and meet with their adviser regularly to assess progress toward meeting all degree requirements.

#### *Senior Year*

In consultation with their advisers, students select advanced courses in the biological sciences that they find particularly interesting. Advisers maintain lists of suggested courses that include offerings from a variety of departments at UW.

### **Undergraduate Minor**

A minor in biology is offered. For details, consult the web site [www.uwyo.edu/biology](http://www.uwyo.edu/biology).

### **Teacher Education**

Students who plan to teach in secondary schools should consult the College of Education section.

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## **Botany**

**114 Aven Nelson Building, 766-2380**

**FAX:** (307) 766-2851

**Web site:** [www.uwyo.edu/botany](http://www.uwyo.edu/botany)

**Department Head:** David G. Williams

#### **Professors:**

**GREGORY K. BROWN**, B.S. Colorado State University 1973; M.S. Arizona State University 1978; Ph.D. 1980; Professor of Botany 1997, 1985.

**INGRID C. BURKE**, B.S. Middlebury College 1980; Ph.D. University of Wyoming 1987; Professor of Botany 2008; Director, Haub School for Environment and Natural Resources and Ruckelshaus Institute for Environment and Natural Resources.

**BRENT E. EWERS**, B.S. Colorado State University 1995; M.S. Duke University 1997; Ph.D. 1999; Professor of Botany 2014, 2002.

**RONALD L. HARTMAN**, B.S. Western Illinois University 1967; M.S. University of Wyoming 1971; Ph.D. University of Texas 1976; Professor of Botany 1988, 1977.

**WILLIAM LAUENROTH**, B.S. Humboldt State University 1968; M.S. North Dakota State University 1970; Ph.D. Colorado State University 1973; Professor of Botany 2008.

**STEVEN L. MILLER**, B.S. University of Wyoming 1979; M.S. Virginia Polytechnic Institute and State University 1982; Ph.D. 1985; Professor of Botany 2002, 1990.

**CYNTHIA WEINIG**, B.A. (Hons.) Brown University 1991; Ph.D. Indiana University; Professor of Botany and Molecular Biology 2013, 2007.

**DAVID WILLIAMS**, B.A. The University of Texas, Austin 1985; M.S. Texas A&M University 1988; Ph.D. Washington State University 1992; Professor of Botany 2009, 2003.

#### **Associate Professors:**

**ALEX BUERKLE**, B.A. (Hons.) University of Missouri 1990; Ph.D. Indiana University 1997; Associate Professor of Botany 2010, 2004.

**DANIEL B. TINKER**, B.S. Ft. Lewis College 1993; M.S. University of Wyoming 1996; Ph.D. 1999; Associate Professor of Botany 2010, 2005.

**NAOMI WARD**, B.Sc. (Hons.) University of Queensland 1993; Ph.D. University of Warwick 1997; Associate Professor of Molecular Biology and Botany 2013, 2007.

#### **Assistant Professors:**

**ELLEN D. CURRANO**, B.Sc. (Hons.) University of Chicago 2003; Ph.D. Pennsylvania State University 2008; Assistant Professor of Botany 2014.

**CATHERINE E. WAGNER**, B.A. (Hons.) Whitman College 2004; Ph.D. Cornell University 2011; Assistant Professor of Botany 2015.

#### **Senior Lecturers:**

**KENNETH L. DRIESE**, B.S. University of Virginia 1981; M.S. University of Wyoming 1992; Ph.D. 2004; Senior Lecturer in Botany 2011, 2002.

**MARK E. LYFORD**, B.A. St. Olaf College 1993; M.S. University of Wyoming 1995; Ph.D. 2001; Senior Lecturer in Botany 2014, 2005; Director of Life Sciences Program.

#### **Assistant Lecturers:**

**CHRISTOPHER NORTH**, B.S. Virginia Polytechnic Institute and State University 2002; M.S. Eastern Illinois University 2005; Assistant Lecturer in Botany 2014.

**BRIANNA WRIGHT**, B.S. University of Wisconsin-Stevens Point 2005; M.S. University of Wyoming 2007; Assistant Lecturer in Botany 2012, 2010.

#### **Senior Research Scientist:**

**RAMESH SIVANPILLAI**, B.Sc. Bharathiar University 1987; M.Sc. Cochin University of Science and Technology 1990; M.Phil. Bharathiar University 1992; M.S. University of Wisconsin, Green Bay 1995; Ph.D. Texas A&M University 2002; Senior Research Scientist 2012.

#### **Associate Research Scientist:**

**BURRELL E. NELSON**, B.A. Andrews University 1971; M.A. University of Wyoming 1974.

#### **Professors Emeriti:**

Martha Christensen, Dennis H. Knight, Stephen T. Jackson, William A. Reiners

Botany is the study of plants and their relationship to human affairs. The science is fundamental to food, fiber and pharmaceutical production; to the management of landscapes for beauty, recreation, forest products and forage; and to the protection of landscapes against pollution and other abuses. The botanist is concerned with the diversity and classification of plants and fungi, their structure at both the macroscopic and microscopic levels, and their physiology, ecology and genetics and evolutionary relationships.

Courses in botany have been developed to meet the needs of the following groups of students: those who desire a general knowledge of the subject for its cultural value; those specializing in areas which require a background in plant biology; and those selecting botany or biology as a major.

### **Undergraduate Degrees**

#### *Biology*

The Biology major is designed for students interested in obtaining a broad education in biological sciences. It enables students to combine courses in biology, botany, zoology, physiology, and other biological sciences to meet the requirements of the major. On completion of the core requirements for the major, specific courses selected to complete the major may vary according to students' interests and are worked out by consultations between student and adviser. The requirements for a bachelor's

degree are MATH 1400, 1405 (or 1450), 2200; STAT 2050 or 2070; CHEM 1000 or 1020, CHEM 2300; COSC 1010; MOLB 3610; PHYS 1110, 1120; LIFE 1010, 2022, 2023; MOLB/MICR 2021; LIFE 3050, 3400, 3500, 3600.

See [www.uwyo.edu/biology/](http://www.uwyo.edu/biology/) for more information.

### Botany

Students majoring in botany may pursue a B.S. degree and are required to take the following: BOT 3000, 4640, or 4680, 4700, 4730, and 3 additional credits in BOT (excluding BOT 4100 and 4550); LIFE 1010, 2022, 2023, 3400, 3410, 3050, 3600; MICR/MOLB 2021; or the equivalents of these courses. In addition, majors must take CHEM 1020, 1030, and 2300 or 2320; MATH 2200 or STAT 2050 or 2070; PHYS 1110 or 1310, and 1120 or 1320.

See [www.uwyo.edu/botany/](http://www.uwyo.edu/botany/) for more information.

The department offers an undergraduate environment and natural resources (ENR) concentration which provides botany students both academic and practical experience interacting with students from other ENR-related disciplines. See the School of Environment and Natural Resources section in this *Catalog* for more information.

### Undergraduate Minor

A minor is offered by the Department of Botany. Further information may be obtained by contacting the department, or at [www.uwyo.edu/botany/](http://www.uwyo.edu/botany/).

### Teacher Education

Botany collaborates with the College of Education in offering the Natural Sciences Program, which provides training in science and mathematics for prospective K-12 teachers.

### Graduate Study

The Department of Botany offers graduate programs leading to the master of science and the doctor of philosophy degrees in botany and the master of science degree in botany/water resources.

### Program Specific Admission Requirements

The program requires a composite minimum score on the verbal and quantitative sections of the GRE of: 900 (M.S.) and 1000 (Ph.D.).

A minimum GPA of 3.0 on previous coursework is also required.

### Program Specific Degree Requirements

Regardless of field of specialization, all candidates will be held responsible for basic information in the following areas: genetics, physiology, morphology, and evolutionary and environmental botany. A knowledge of chemistry (including organic and elementary biochemistry), physics, calculus, and statistics may be required.

A minimum GPA of 3.0 must be maintained. Any course in which a C (or below) or U is obtained cannot be counted toward the degree requirement.

Participation in seminars will be required of all candidates during their residence at the University of Wyoming.

#### Master's Program

Requirements for this degree are 26 semester hours of courses approved by the student's committee plus four hours of BOT 5960, Thesis Research.

#### Doctoral Program

In addition to the minimum requirements set forth in this Catalog, the Department of Botany may require that a student demonstrate skills in two peripheral areas. This decision is made for individual cases by the major professor and graduate committee. These could include foreign languages, statistics, or computer science. In some cases, additional skills may be required.

### Botany (BOT)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**3000. Plant Form and Function. 4.** Integration of basic vascular plant anatomy, morphology, physiology within the contexts of modern evolutionary and ecological theory. Students receive in depth exposure to fluid flow, energetics, development, growth, general metabolism, and structure, and functions for plant cells, tissue and organs. *Prerequisite:* LIFE 2023 or LIFE 2022 or equivalent; and minimum of 4 credits of college chemistry. (Normally offered spring semester)

**3100. Plants and Civilization. 3. [L♦(none)]** An overview of ways plants have and will continue to influence human civilizations. Botanical origins and socio-economic impacts of deforestation, plant fibers, stimulants, drugs and medicinals, wood products, foods and other plant-derived resources is discussed. Students write short papers building skills

in research, critical thinking, argumentation, and citation strength. *Prerequisite:* LIFE 1000 or 1010. (Normally offered spring semester)

**3150. Survey of Remote Sensing Applications. 3.** Provides an introduction to remote sensing with a survey of applications in different fields. It includes a brief introduction to fundamentals of remote sensing and surveys applications of aerial photography, multi-and hyperspectral, active and thermal remote sensing, and global change remote sensing. Cross listed with GEOG 3150. *Prerequisites:* completion of a USP QA course and one science course with laboratory.

**3600. Plant Diversity and Systematics. 4.** A broad introduction to modern vascular plant systematics, with emphasis on identification, classification, nomenclature, speciation, adaptation, convergence, and phylogenetic methods. Lab emphasizes learning major flowering plant families and genera, major invasive species, use of keys and manuals, and plant collection, with a Wyoming and Rocky Mountain focus. *Prerequisite:* LIFE 2023, or equivalent.

**4001. Modeling the Earth System. 4.** Takes a modeling approach to demonstrate how the Earth is integrated into an interconnected system through exchanges of energy and matter, and how Earth system functioning is susceptible to human alteration. Unifying concepts focus on quantitative interactions between the Earth and the Sun, and between the Earth's lithosphere, hydrosphere, biosphere and atmosphere. Cross listed with ATSC/ESS/GEOL. *Prerequisites:* MATH 2205 or equivalent and [ESS 2000 or GEOL 2000].

**4040 [G&R 4040]. Conservation of Natural Resources. 3. [CS♦(none)]** Geographically analyzes conservation of natural and human resources, as well as political, social and ethical ramifications of our environmental policy. Cross listed with ENR/GEOG 4040. *Prerequisite:* 6 hours of geography or ENR.

**4100. Scientific Communication. 3. [WC,L♦COM3]** This course is designed to provide intensive instruction in written, oral, and digital communication for zoology and physiology, biology, and botany majors. The course teaches students to communicate and execute research using practices common in the biological sciences. Cross listed with ZOO 4100. *Prerequisites:* COM1, COM2, and concurrent or prior upper division BOT, ZOO, or LIFE course.

**4111. Remote Sensing of the Environment. 4.** Combined lecture and laboratory course introduces students to the fundamentals of remote sensing with a strong emphasis on vegetation, land cover and environmental applica-

tions. Students learn to use digital spectral data to distinguish characteristics of the terrestrial biosphere important for ecological and land management applications. Dual listed with BOT 5111; cross listed with GEOG 4111. *Prerequisites:* QA and one science course with lab.

**4130. Applied Remote Sensing for Agricultural Management. 3.** Address principles and applications of remote sensing to crop and rangeland management. Provides an overview of remote sensing concepts and applications pertaining to crops, shrubs and range vegetation. In laboratory, students will learn to process remotely sensed data for mapping and monitoring crop and rangelands. Cross listed with RNEW/AECL 4130; dual listed with BOT 5130. *Prerequisites:* QA course and 9 credit hours in student's major field and junior/senior standing.

**4211. Advanced Remote Sensing of the Environment. 4.** Includes lecture and laboratory. Specific topics include a review of remote sensing fundamentals and methods for using high spatial resolution data, hyperspectral data, active remote sensing, advanced image processing, advanced classification techniques and statistical techniques specific to exploring remotely sensed data. Cross listed with GEOG 4211; dual listed with BOT 5211. *Prerequisite:* BOT/GEOG/GEOL 4111.

**4280. Paleobotany. 4.** An examination of the ecology and evolution of land plants throughout Earth history that emphasizes the profound impact plants have had on Earth's surface and atmosphere. Through a combination of lecture, discussion, and laboratory, the course will explore fossilized plant communities, their ecological properties, and effects of major environmental upheavals. Dual listed with BOT 5280. Cross listed with GEOL 4280. *Prerequisite:* LIFE 1010 or GEOL 1100.

**4330. Cultivation of Edible Mushrooms. 3.** An in-depth study of mushroom cultivation emphasizing a hands-on approach. Students learn about the history and biology of edible and medicinal mushrooms as well as about tissue culture, spawn generation techniques, substrate preparation, inoculation techniques, and strategies for maximizing yield. *Prerequisite:* LIFE 2023.

**4360. Mushrooms of the Rocky Mountains. 3.** A broad introduction to the biology of mushrooms, with emphasis on identification, ecology, and safety for consumption. Lab emphasizes learning major mushroom families and genera and their features, use of keys and manuals, and mushroom collections with a Wyoming and Rocky Mountain focus. *Prerequisites:* LIFE 2023 or equivalent.

**4395. Symbiosis. 4.** Symbiosis, the living together of unlike organisms, encompasses mutually beneficial to reciprocally detrimental interactions. The course examines conditions required for establishment and maintenance of important symbioses including mycorrhizae, lichens, endophytes, nitrogen-fixing and endosymbiotic bacteria, fungal/insect interactions, and fungal pathogens. Symbioses in forest ecosystems will be emphasized. Dual listed with BOT 5395. *Prerequisites:* LIFE 2022 or LIFE 2023, and LIFE 3400.

**4420. Conservation Biology. 3.** Addresses the broadest environmental issues facing society (habitat loss, invasion, overexploitation) and the mechanisms driving them, with particular attention to the Intermountain West. Through computer exercises, students also learn how to evaluate conservation efforts and make management recommendations. Cross listed with ENR/ZOO 4420. *Prerequisites:* LIFE 3400 and one of the following: ENR 3500, STAT 2050, or STAT 2070.

**4550. Computational Biology. 4.** Introduces concepts and skills that are generally applicable to computational analysis of biological questions. Content is motivated by applied projects that require basic computer programming for analysis. Two computer languages are introduced and utilized. Dual listed with BOT 5550. *Prerequisite:* MATH 2200 or STAT 2050 or equivalent; LIFE 1010 or equivalent.

**4640. Flora of the Rocky Mountains. 3.** Field course. Acquaints students with the flora of the surrounding region. Emphasizes field identification and collection from plant communities encompassing a wide range of environments, such as grasslands, forests and alpine tundra. *Prerequisite:* LIFE 2023. (Normally offered summer session)

**4664. Special Topics in Evolution. 1-4 (Max. 6).** Advanced topics in evolutionary biology are engaged by studying primary research and topical synthesis in the current literature. Dual listed with BOT 5664. *Prerequisite:* LIFE 3500 or equivalent.

**4680. Taxonomy of Vascular Plants. 4.** A study of classification principles, nomenclature rules and systematic botany literature. Plants of the Rocky Mountain region are used primarily as examples, but the course gives a comprehensive view of the characteristics and relationships of the principal plants families. Dual listed with BOT 5680. *Prerequisite:* LIFE 2023. (Normally offered spring semester)

**4700. Vegetation Ecology. 4.** Reviews the ecology of major vegetation types, emphasizing patterns of vegetation distribution, vegetation-environment relationships, suc-

cession, the effect of fire and management decisions, and methods of vegetation analysis. Dual listed with BOT 5700. *Prerequisite:* LIFE 3400. (Normally offered fall semester)

**4730. Plant Physiological Ecology. 4.** Acquaints advanced students with environmental factors which affect the establishment and growth of plants. Emphasizes adaptive mechanisms. Dual listed with BOT 5730; cross listed with RNEW 4730. *Prerequisites:* one course in physiology and one course in ecology. (Normally offered spring semester)

**4745. Terrestrial Ecosystem Ecology. 3.** Advanced course examines fundamental ecosystem functions and their relationship to ecosystem structure using a systems approach. We study cycles of carbon, water and nutrients through ecosystem components with an emphasis on interactions among plants, soil, and the atmosphere. Current readings focus on responses of terrestrial ecosystems to global climate change and human disturbance. Dual listed with BOT 5745; cross listed with ECOL 5745. *Prerequisite:* 1 course in ecology.

**4775. Forest Ecology. 4.** Integrative study of the structure, function, and ecological diversity of forested ecosystems, and the physical factors that influence this diversity, including emergent properties of energy flow and nutrient cycling. Special emphasis is given to understanding forest disturbances and succession, and implications for impacts of management and sustainability are discussed throughout. Dual listed with BOT 5775; cross listed with RNEW 4775. *Prerequisite:* LIFE 3400. (Normally offered fall semester of odd-numbered years)

**4780. Biogeochemistry. 4.** A comprehensive treatment of biogeochemistry with emphasis on biogenic elements and biological processes. Reviews occurrence of elements, their behavior in the biosphere, and how their cycles are affected by humans. Dual listed with BOT 5780. *Prerequisite:* a course in organic chemistry.

**4790 [4710]. Special Topics in Ecology. 1-3 (Max. 6).** Acquaints students with various topics not covered in regular courses. Emphasizes recent developments appearing in journal literature. Dual listed with BOT 5790. *Prerequisite:* two courses in ecology. (Normally offered both semesters)

**4965. Undergraduate Research in Botany. 1-10 (Max. 10).** Undergraduate research or study in botany done under the guidance of a Botany Faculty Member. Encouraged to present their research at local, regional, or national scientific meetings, and, when appropriate,



submit a manuscript for publication. *Prerequisite:* LIFE 2023, undergraduate status in good academic standing; consent of a botany faculty research mentor. (Offered fall, spring and summer)

**4970. Internship. 1-12 (Max. 12).** Provides undergraduate students with academic credit for approved work experiences in the fields of botany and biology. Must be arranged in consultation with a botany faculty member and the work supervisor. Offered S/U only. *Prerequisites:* junior or senior standing, 3.0 GPA, declared major in botany or biology, and approval by a botany faculty member and work supervisor.

**5000. Graduate Seminar. 1-3 (Max. 6).** Selected topics on current research in the botanical sciences. Offered satisfactory/unsatisfactory only. *Prerequisite:* 15 hours of botany or biology.

**5060. Fundamental Concepts in Evolution. 3.** Explores fundamental concepts in evolutionary biology including evolutionary ecology, population genetics, and speciation with an emphasis on both theoretical frameworks and practical applications. Discussion included. Cross listed with ECOL/ZOO 5060. *Prerequisite:* graduate student in good standing.

**5111. Remote Sensing. 4.** Introduces students to the fundamentals of remote sensing with a strong emphasis on vegetation, land cover and environmental applications. Students learn to use digital spectral data to distinguish characteristics of the terrestrial biosphere important for ecological and land management applications. Dual listed with BOT 4111; cross listed with GEOG 4111/5111. *Prerequisites:* QA and one science course with laboratory.

**5130. Applied Remote Sensing for Agricultural Management. 3.** Address principles and applications of remote sensing to crop and rangeland management. Provides an overview of remote sensing concepts and applications pertaining to crops, shrubs and range vegetation. In laboratory, students will learn to process remotely sensed data for mapping and monitoring crop and rangelands. Dual listed with BOT 4130; cross listed with RNEW 5130. *Prerequisites:* QA course and 9 credit hours in student's major field and junior/senior standing.

**5150. Research in Remote Sensing. 1-6 (Max. 6).** Independent research into problems on the remote sensing of vegetation using satellite technology. *Prerequisite:* graduate standing and consent of instructor.

**5211. Advanced Remote Sensing of the Environment. 4.** Includes lecture and laboratory. Specific topics include a review of remote sensing fundamentals and methods for using

high spatial resolution data, hyperspectral data, active remote sensing, advanced image processing, advanced classification techniques and statistical techniques specific to exploring remotely sensed data. Dual listed with BOT 4211; cross listed with GEOG 5211. *Prerequisite:* BOT/GEOG 4111.

**5280. Paleobotany. 4.** An examination of the ecology and evolution of land plants throughout Earth history that emphasizes the profound impact plants have had on Earth's surface and atmosphere. Through a combination of lecture, discussion, and laboratory, the course will explore fossilized plant communities, their ecological properties, and effects of major environmental upheavals. Dual listed with BOT 4280. Cross listed with GEOL 5280. *Prerequisite:* LIFE 1010 or GEOL 1100.

**5320. Research in Mycology. 1-3 (Max. 6).** *Prerequisite:* graduate standing or consent of instructor.

**5395. Symbiosis. 4.** Symbiosis, the living together of unlike organisms, encompasses mutually beneficial to reciprocally detrimental interactions. The course examines conditions required for establishment and maintenance of important symbioses including mycorrhizae, lichens, endophytes, nitrogen-fixing and endosymbiotic bacteria, fungal/insect interactions, and fungal pathogens. Symbioses in forest ecosystems will be emphasized. Dual listed with BOT 4395. *Prerequisites:* LIFE 2022 or LIFE 2023, and LIFE 3400.

**5420. Research in Physiology. 1-6 (Max. 6).** *Prerequisite:* graduate standing and consent of instructor.

**5480. Spatial Information Sciences Seminar. 1.** There are many earth science technologies, remote sensing, GIS and GPS. Synergism among these technologies increase the range of solutions for research and management. This course is a forum for presentation of these solutions or questions requiring solutions. Cross listed with GEOL 5480. *Prerequisite:* a course in remote sensing, GIS, GPS, and graduate standing.

**5550. Computational Biology. 4.** Introduces concepts and skills that are generally applicable to computational analysis of biological questions. Content is motivated by applied projects that require basic computer programming for analysis. Two computer languages are introduced and utilized. Dual listed with BOT 4550. *Prerequisites:* MATH 2200 or STAT 2050 or equivalent; LIFE 1010 or equivalent.

**5610. Research in the Taxonomy of Vascular Plants. 1-6 (Max. 6).** The University of Wyoming is especially well equipped for research on the classification of native plants. The Rocky Mountain Herbarium offers an

abundance of material for study and the library is especially rich in taxonomic literature. Monographic work may be done on an assigned genus or on the plants of a limited area. Cytological, anatomical, and biochemical techniques may be employed in the solution of certain problems. *Prerequisite:* graduate standing and consent of instructor.

**5650. Readings in Plant Systematics. 1 (Max. 6).** Centered on readings involving selected topics in the current plant systematics literature. *Prerequisite:* BOT 4680.

**5660. Plant Evolution. 2.** Designed to acquaint graduate students with theories concerning the processes of plant evolution. *Prerequisite:* LIFE 3050.

**5664. Topics: Evolution. 1-4 (Max. 12).** Advanced topics in evolutionary biology are engaged by studying primary research and topical syntheses in the current literature. Dual listed with BOT 4664. *Prerequisite:* LIFE 3500 or equivalent.

**5665. Research in Evolutionary Biology. 1-6 (Max. 6).** *Prerequisites:* graduate standing and consent of instructor.

**5670. Phylogeny of Flowering Plants. 2.** Covers trends in the evolution of flowering plants. *Prerequisite:* BOT 4680.

**5680. Plant Taxonomy. 4.** Detailed work in the principles of classification, rules of nomenclature, and literature of systematic botany. The plants of the Rocky Mountain region are used primarily as examples, but the course gives a comprehensive view of the characteristics and relationships of the principal families of vascular plants. Dual listed with BOT 4680. *Prerequisite:* LIFE 2023.

**5690. Special Topics in Systematics. 1-4 (Max. 12).** Designed to acquaint students with various topics not covered in regular courses. Emphasis is placed on recent developments in the journal literature. *Prerequisite:* BOT 4680 or 5680 or equivalent.

**5700. Vegetation Ecology. 4.** The ecology of major vegetation types, with emphasis on patterns of vegetation distribution, vegetation-environment relationships, succession, the effect of fire and management decisions, and methods of vegetation analysis. Dual listed with BOT 4700. *Prerequisite:* LIFE 3400.

**5710. Research in Ecology. 1-6 (Max. 6).** *Prerequisite:* graduate standing and consent of instructor.

**5720. Research in Physiological Ecology. 1-6 (Max. 6).** *Prerequisite:* graduate standing and consent of instructor.

**5730. Plant Physiological Ecology. 4.** Acquaints advanced students with environmental factors which affect the establishment and growth of plants. Emphasizes adaptive

mechanisms. Lecture with inclusive hands-on laboratory. Dual listed with BOT 4730; cross listed with RNEW 5730. *Prerequisite*: one course in ecology and one in physiology.

**5745. Terrestrial Ecosystem Ecology. 3.** Advanced course examines fundamental ecosystem functions and their relationship to ecosystem structure using a systems approach. Study cycles of carbon, water and nutrients through ecosystem components with an emphasis on interactions among plants, soil, and the atmosphere. Current readings focus on responses of terrestrial ecosystems to global climate change and human disturbance. Dual listed with BOT 4745; cross listed with ECOL 5745. *Prerequisite*: one course in ecology.

**5750. Seminar in Ecophysiology. 1-3 (Max. 8).** *Prerequisite*: 1 course in physiology and 1 course in ecology.

**5775. Forest Ecology. 4.** Integrative study of the structure, function, and ecological diversity of forested ecosystems, and the physical factors that influence this diversity, including emergent properties of energy flow and nutrient cycling. Special emphasis is given to understanding forest disturbances and succession, and implications for impacts of management and sustainability are discussed throughout. Dual listed with BOT 4775; cross listed with ECOL/RNEW 5775. *Prerequisites*: LIFE 3400.

**5780. Biogeochemistry. 4.** A comprehensive treatment of biogeochemistry with emphasis on biogenic elements and biological processes. Reviews occurrence of elements, their behavior in the biosphere, and how their cycles are affected by humans. Dual listed with BOT 4780. *Prerequisites*: a course in organic chemistry.

**5790. Special Topics in Ecology. 1-3 (Max. 6).** Designed to acquaint advanced students with various topics not covered in other courses. Emphasis is placed on recent developments appearing in the journal literature. Dual listed with BOT 4790. *Prerequisite*: two courses in ecology.

**5900. Practicum in College Teaching. 1-3. (Max 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite*: graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite*: advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite*: advanced degree candidacy.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for

students whose coursework is complete and are writing their thesis. *Prerequisite*: enrolled in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Graduate level course designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite*: enrolled in a graduate level degree program.

## Chemistry

403 Physical Sciences Building, 766-4363  
FAX: (307) 766-2807

Web site: [www.uwyo.edu/chemistry](http://www.uwyo.edu/chemistry)

Department Head: David T. Anderson

### Professors:

**DAVID T. ANDERSON**, B.S. George Washington University 1987; Ph.D. Dartmouth College 1993; Professor of Chemistry 2012, 2000.

**EDWARD L. CLENNAN**, B.S. University of Wisconsin-River Falls 1973; Ph.D. University of Wisconsin-Madison 1977; Professor of Chemistry 1989, 1979.

**BRUCE A. PARKINSON**, B.S. Iowa State University 1972; Ph.D. California Institute of Technology 1977; Professor of Chemistry 2008.

**DEAN M. RODDICK**, B.S. University of California-Berkeley 1979; Ph.D. California Institute of Technology 1984; Professor of Chemistry 1997, 1986.

### Associate Professors:

**MILAN BALAZ**, M.S. Comenius University 1999; Ph.D. Université Louis Pasteur 2003; Associate Professor of Chemistry 2014, 2008.

**FRANCO BASILE**, B.S. University of Wisconsin-Eau Claire 1986; Ph.D. Purdue University 1992; Associate Professor of Chemistry 2009, 2003.

**ROBERT C. CORCORAN**, B.S. University of Chicago 1978; Ph.D. Columbia University 1983; Associate Professor of Chemistry 1992.

**DEBASHIS DUTTA**, B. Tech Indian Institute of Technology 1998; Ph.D. University of Notre Dame 2003; Associate Professor of Chemistry 2011, 2006.

**JOHN O. HOBERG**, B.A. Jamestown College 1984; Ph.D. Montana State University 1990; Associate Professor of Chemistry 2004.

**JAN KUBELKA**, M.S. Charles University of Prague 1996; Ph.D. University of Illinois at Chicago 2002; Associate Professor of Chemistry 2011.

**TERESA LEHMANN DELLA VOLPE**, B.S. Universidad Central de Venezuela 1987; Ph.D. University of Minnesota 1997; Associate Professor of Chemistry 2014, 2008.

**JING ZHOU**, B.S. Xiamen University 1997; Ph.D. University of South Carolina 2004; Associate Professor of Chemistry 2013, 2007.

### Assistant Professors:

**BRIAN M. LEONARD**, B.S. University of Nebraska at Kearney 2003; Ph.D. Texas A&M 2008; Assistant Professor of Chemistry 2010, 2012.

**KRISZTINA VARGA**, B.S. St. John's University 1996; M.A. Columbia University 2001; Ph.D. 2005. Assistant Professor of Chemistry 2010.

### Research Faculty:

**NAVAMONEY ARULSAM**, B.Sc. Madurai-Kamaraj University, India 1982; M.Sc. 1986; Ph.D. University of Hyderabad, India 1991; Senior Research Scientist 2013, 2005.

**ALEXANDER GORONCY**, B.S. University of Bremen; Ph.D. University of South Carolina; Research Scientist 2015.

### Adjunct Professors:

**YURI DAHNOVSKI**, Ph.D. Institute of Chemical Physics, Moscow 1983; Adjunct Professor of Chemistry 2001.

**MAOHONG FAN**, Ph.D. Osaka University 2003; Adjunct Associate Professor of Chemistry 2009.

### Associate Lecturer:

**CARLA DEE BECKETT**, B.S. University of Wyoming 1991; M.S. 2007; Associate Lecturer of Chemistry 2011, 2012.

### Senior Lecturer:

**PATRICIA A. GOODSON**, B.S. University of Alabama 1983; M.S. University of Wisconsin-Madison 1986; Ph.D. University of Wyoming 1990; Senior Lecturer of Chemistry 2008, 1999.

**MICHAEL S. SOMMER**, B.A. Queens College, CUNY 1984; M.A. 1985; A.M. Harvard University 1987; Ph.D. 1996; Senior Lecturer of Chemistry 2011, 2001.

### Professors Emeritus:

Vernon Archer, Daniel A. Buttry, Keith T. Carron, Geoffrey Coates, Clyde Edmiston, Anthony Guzzo, Suzanne Harris, Robert Hurtubise, David Jaeger, John Maurer, E.G. Meyer, David A. Nelson, Lewis Noe

Chemistry is one of the fundamental physical sciences dealing with the structure and properties of matter, along with changes that matter undergoes. Chemistry's scope encompasses all substances, living and non-living. Its study and practice include (1) the theoretical and experimental aspects of chemical bonding and structure using computational, spectroscopic, and diffraction techniques; (2) the

laboratory synthesis from simple starting materials of desirable compounds in the inorganic, organic and biological classes; and (3) the total analysis of complex mixtures using modern spectroscopic and electrochemical methods. Since we live in a material world, applications of chemical knowledge influence most areas of human endeavor: scientific, economic, political and social. Many of the advances in the areas of new materials, medicines, biotechnology, food production, new energy sources and semiconductor technology associated with the "computer revolution" are based on chemistry and chemical principles. Some understanding of these chemical principles should be part of every educated person's knowledge.

Because of the broad scope of this discipline, the Department of Chemistry offers a variety of courses and programs. These programs meet the needs of students planning professional careers in chemistry and those wishing to major in chemistry for other objectives. In particular, chemistry is a traditional preprofessional major for students interested in medicine and dentistry. Specific courses are offered to serve other major areas and as part of University Studies and A&S core requirements.

Students who have taken an AP examination and have received a score of 4 or 5 may receive credit for CHEM 1020 and 1030.

### Undergraduate Major

The department offers **both**, B.A. and B.S. degree programs. The B.A. degree includes a minimum of 32 hours of chemistry. The Plan 1 B.S. degree requires at least 38 hours. The Plan 2 B.S. requires 46 hours of chemistry courses. Since the chemistry required in the first two years of all programs is the same, students interested in pursuing a chemistry major can elect any program initially. Discussions with a departmental adviser will allow students to choose the most appropriate major for their career objectives. In general, students planning graduate work in chemistry should elect one of the B.S. programs. The B.A. program has a more liberal content with additional electives. It would support careers in business, law and advanced study in areas needing a strong chemistry background such as toxicology or forensic science.

A B.A. is suitable for students in the College of Education who wish to obtain an A&S degree, and may also be appropriate for some premedical tracks. The Plan 2 professional pro-

gram is designed to meet standards set by the American Chemical Society (ACS). A student who completes the Plan 2 B.S. program will be certified by the Department of Chemistry to the ACS as having met the specific ACS requirements for undergraduate professional training in chemistry.

### Plan 1 B.A. in Chemistry

(32 hours of chemistry)

Course Requirements	Hrs.
<b>Basic chemistry</b> .....	<b>26</b>
1050 and 1060 (or 1020 and 1030), 2230, 2420 and 2440, 3550 or 4507, and 4110	
<b>Additional upper-level chemistry</b> .....	<b>6</b>
(including one of the following: 4100, 4230, or 4530)	
MATH 2200 and 2205 .....	8
<b>PHYS</b> .....	<b>8</b>
1310 and 1320 (or 1110 and 1120 or 1210 and 1220)	
<b>Additional University Studies requirements</b> .....	<b>28</b>
(assumes double count on Global Awareness course and CHEM 1001)	
<b>Additional A&amp;S core requirements</b> .....	<b>17</b>
(assumes double count on non-western course)	
<b>Electives</b> .....	<b>27</b>
<b>Physical education</b> .....	<b>1</b>
<b>Total Hrs.</b>	<b>121</b>

### Plan 1 B.S. in Chemistry

(38 hours of chemistry)

Course Requirements	Hrs.
<b>Basic chemistry</b> .....	<b>34</b>
1050 and 1060 (or 1020 and 1030), 2230, 2420 and 2440, 4000 (1 hour), 4100, 4110, 4507, 4508, 4525 and 4530	
CHEM 4930 .....	2
Additional upper-level chemistry .....	3
MATH 2200, 2205 and 2210.....	12
<b>PHYS</b> .....	<b>8</b>
1310 and 1320 (or 1210 and 1220)	
<b>Additional University Studies requirements</b> .....	<b>28</b>
(assumes double count on Global Awareness course and CHEM 1001)	
<b>Additional A&amp;S core requirements</b> .....	<b>17</b>
(assumes double count on non-western course)	
<b>Electives</b> .....	<b>17</b>
<b>Physical education</b> .....	<b>1</b>
<b>Total Hrs.</b>	<b>121</b>

### Plan 2 Professional B.S. in Chemistry

(46 hours of chemistry)

Course Requirements	Hrs.
<b>Basic chemistry</b> .....	<b>41-42</b>
1050 and 1060 (or 1020 and 1030), 2230, 2420 and 2440, 3610 (or MOLB 4600), 4000 (1 hour), 4100, 4110, 4230, 4507, 4508, 4525 and 4530	
CHEM 4930 .....	3
Additional upper-division chemistry .....	2-3
MATH 2200, 2205 and 2210.....	12
<b>PHYS 1310 and 1320</b> .....	<b>8</b>
(or 1210 and 1220)	
<b>Computer science</b> .....	<b>3</b>
(STAT 2050, CHEM 4515, COSC 1010)	
<b>Additional USP requirements</b> .....	<b>28</b>
(assumes double count on Global Awareness course and CHEM 1001)	
<b>Additional A &amp; S core requirements</b> .....	<b>10-12</b>
Two upper-division courses outside chemistry or two semesters of a single foreign language. (assumes double count on non-western course)	
<b>Program supporting courses</b> .....	<b>18</b>
A group of courses selected to further the career objectives of the individual student. These are chosen after consultation with the departmental adviser and must subsequently be approved by the departmental Undergraduate Studies Committee	
<b>Electives</b> .....	<b>4-7</b>
<b>Physical education</b> .....	<b>1</b>
<b>Total Hrs.</b>	<b>129</b>

### Suggested Program for a Bachelor's Degree in Chemistry

(Freshman and Sophomore Years)

#### Suggested Course Sequence

FRESHMAN YEAR: Fall	Hrs.
CHEM 1050 or 1020 .....	4
ENGL 1010 .....	3
MATH 2200 .....	4
A&S Core or University Studies Requirements .....	3-4
CHEM 1001 .....	1
<b>Total Hrs.</b>	<b>15-16</b>
<b>FRESHMAN YEAR: Spring</b>	<b>Hrs.</b>
CHEM 1060 or 1030 .....	4
MATH 2205.....	4
A&S core or University Studies requirements .....	6-8
<b>Total Hrs.</b>	<b>14-16</b>

<b>SOPHOMORE YEAR: Fall</b>		<b>Hrs.</b>
CHEM	2420.....	4
MATH	2210 (B.S. requirement).....	4
PHYS	1310 or 1210 or 1110.....	4
A&S core or University Studies requirements.....		3-4
<b>Total Hrs.</b>		<b>15-16</b>

<b>SOPHOMORE YEAR: Spring</b>		<b>Hrs.</b>
CHEM	2440.....	4
CHEM	2230.....	4
PHYS	1320 or 1220 or 1120.....	4
A&S core or University Studies requirements.....		3-4
<b>Total Hrs.</b>		<b>15-16</b>

### Undergraduate Minor

A minor is offered in the Department of Chemistry. Further information may be found at the web site [www.uwyo.edu/chemistry](http://www.uwyo.edu/chemistry).

### Teacher Education

Teacher certification requirements are available through the College of Education. Students preparing to teach chemistry in the secondary schools are advised to take a major in chemistry or a major composed of carefully selected courses in chemistry and related sciences.

A special interdisciplinary curriculum in chemistry and a related area may be arranged. (See department head for information).

### Graduate Study

The Department of Chemistry offers programs leading to the degrees of master of science and doctor of philosophy chemistry. The master's degree is offered mainly under Plan A with Plan B reserved for special circumstances.

The department also participates in the preparation of students for the degrees of master of science in natural science and master of science in teaching (M.S.T.), which are designed to improve the competence of those engaged in science teaching.

### Program Specific Admission Requirements

In addition to the minimum requirements set forth in this *Catalog*, the Department of Chemistry requires that a student have taken the following undergraduate courses: one year of general chemistry; one semester/quarter of quantitative analysis; one year of organic chemistry plus laboratory; one year of physical

chemistry plus laboratory; one year of physics; and mathematics through multivariable calculus. As appropriate, one or more of these course requirements may be waived at the discretion of the department.

### Program Specific Degree Requirements

#### *Master's Program Plan A (thesis)*

In addition to fulfilling the minimum university requirements, a student must take one 3 hour course in each of three of the four areas (inorganic, analytical, organic, and physical), excluding special topics and research courses. These courses must be graduate courses, 5000 and above.

A student may also take 9 credits of any combination of CHEM 5190, 5290, 5390, 5590, or 5790.

One departmental seminar is required to be presented on the thesis research.

#### *Doctoral Program*

In addition to fulfilling the minimum university requirements, a student must take one 3 hour graduate course (5000 and above) in each of the four areas (inorganic, analytical, organic, and physical), excluding special topics, tool courses 5130, 5320, 5760, and research courses.

A student may also take 12 credits of any combination of CHEM 5190, 5290, 5390, 5590, or 5790.

In the area selected as a major, the student will take the following as a minimum:

1. Analytical - 5250 plus 9 hours of graduate level analytical courses;
2. Inorganic - 12 hours of graduate level inorganic courses;
3. Organic - 5320, 5330, 5340 and 5350;
4. Physical - any three graduate level physical chemistry courses;

Students must obtain satisfactory performance on a series of written major field cumulative examinations, including special topics.

Students must obtain satisfactory performance on a preliminary examination, part written and part oral.

Students must present a seminar based on the dissertation research. Students must also obtain two additional credits of CHEM 5000 by presenting a divisional or departmental seminar or an oral presentation at a regional or national research meeting.

## Chemistry (CHEM)

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).**

### 1000. Introductory Chemistry. 4. [SP◀▶PN]

Deals with principles of chemistry and some applications to inorganic chemistry. For students in family and consumer sciences, nursing, education, general arts and sciences and most agriculture curricula. Students who have credit in CHEM 1020 or 1050 may not receive duplicate credit for this course. Laboratory and discussion: 3 hours per week. *Prerequisite:* Minimum grade of C in MATH 0925, or level 3 on the MPE, or ACT math score of 23 or above. (Normally offered fall semester)

### 1001. The Chemical Community. 1. [I,L◀▶(none)]

A survey of chemistry both as a major and a discipline. Chemistry's historical role, the scientific method, scientific ethics, as well as current challenges in the major fields of chemistry are discussed. Information literacy is strongly emphasized, both by familiarization with university resources as well as specialized chemical databases. (Normally offered fall semester)

### 1020. General Chemistry I. 4. [SP◀▶PN]

First semester of a one-year introductory series. Provides broad coverage of chemistry principles with inorganic and organic systems applications. Credit will not be allowed for more than one of CHEM 1020, 1050 and 1000. Laboratory and discussion: 3 hours per week. *Prerequisite:* ACT Math score of 23 or above, or concurrent enrollment in Math 1400, or 1405 or 1450. (Normally offered fall, spring and summer)

### 1030. General Chemistry II. 4. [SP◀▶PN]

Second semester of a one-year introductory series. Provides broad coverage of chemistry principles with inorganic and organic systems applications. Credit will not be allowed for more than one of CHEM 1030 and 1060. Laboratory and discussion: 3 hours per week. *Prerequisite:* CHEM 1020. (Normally offered fall, spring and summer)

### 1050. Advanced General Chemistry I. 4. [SP◀▶PN]

First semester of a one-year series covering chemical principles. Emphasizes inorganic chemistry and briefly discusses qualitative analysis. Credit not given for more than one of CHEM 1020, 1050 and 1000. Laboratory: 3 hours per week. *Prerequisites:* one year high school chemistry, and an ACT Math score of 27 or higher or concurrent enrollment in Math 2200. (Normally offered fall semester)

### 1060. Advanced General Chemistry II. 4. [SP◀▶PN]

Second semester of a one-year series covering chemical principles. Empha-

sizes inorganic chemistry and briefly discusses qualitative analysis. Credit not given for more than one of CHEM 1030 and 1060. Laboratory: 3 hours per week. *Prerequisite:* CHEM 1050 or CHEM 1020, with permission of the instructor. (Normally offered spring semester)

**2000. Special Topics in the Laboratory. 1 (Max. 4).** Introduces students to laboratory experience in chemistry. *Prerequisite:* special permission from the chemistry department.

**2230. Quantitative Analysis. 4.** Broad, general coverage of analytical techniques, principles and calculations. Laboratory: 6 hours per week. *Prerequisite:* CHEM 1030, 1060 or equivalent. (Normally offered spring semester)

**2300. Introductory Organic Chemistry. 4.** Terminal course in organic and beginning biological chemistry. No credit will be allowed in CHEM 2300 if credit earned in CHEM 2420. *Prerequisite:* CHEM 1020, 1050, 1000 or equivalent. Note: This course is **not** an acceptable prerequisite for CHEM 2440. (Normally offered spring semester)

**2420. Organic Chemistry I. 4.** First semester of a one-year sequence in organic chemistry. Approached from the viewpoint of modern chemical theory, emphasizing structural and mechanistic concepts. The course incorporates a laboratory integrated with the lecture. Students desiring a one-semester terminal course should take CHEM 2300. Laboratory: 3 hours per week. No credit allowed in CHEM 2420 if credit earned in 2300. *Prerequisite:* CHEM 1030 or 1060. (Normally offered fall)

**2440. Organic Chemistry II. 4.** Second semester of a one-year sequence in organic chemistry. Approached from viewpoint of modern chemical theory, emphasizing structural and mechanistic concepts. The course incorporates a laboratory integrated with the lecture. Students desiring a one-semester terminal course should take CHEM 2300. Laboratory: 3 hours per week. *Prerequisites:* CHEM 1030 or 1060 and 2420. *Note:* CHEM 2300 is not an acceptable prerequisite for CHEM 2440. (Normally offered spring semester)

**3020. Environmental Chemistry. 3.** Environment and modern environmental problems in terms of chemical structures and reactions. Chemical principles of equilibrium, kinetics, and thermodynamics are used to help understand our changing environment. Topics include toxicological chemistry, aquatic chemistry, atmospheric chemistry, and green chemistry. *Prerequisites:* CHEM 2300 or 2420; 2230; and QA course.

**3550. Physical Chemistry for the Life Sciences. 3.** Deals with areas of physical chemistry of interest to students majoring in the life sciences. Covers thermodynamics, kinetics,

equilibrium and spectroscopy, using biological systems for development and illustration. Credit is allowed for only one of the courses: CHEM 3550 or 4507. *Prerequisites:* CHEM 1030, MATH 2200. (Normally offered every other year)

**4000. Career Skills. 1.** Designed to develop skills needed for success in the chemical profession or in graduate school. Topics include information on graduate programs, resume preparation, scientific writing, oral presentation, technical seminars, and laboratory note keeping. Available S/U only. *Prerequisites:* chemistry major, CHEM 4110 or concurrent enrollment. (Normally offered fall semester)

**4040. Chemical Literature. 1-2 (Max. 2).** Introduces literature of chemistry and methods employed in searching the literature. *Prerequisites:* CHEM 2300 or 2420; CHEM 4507 or 3550 or concurrent enrollment; scientific German recommended. (Normally offered alternating spring semesters)

**4050. Solar Energy Conversion. 3.** Provides an overview of the science behind current and future solar thermal and photovoltaic technologies. Environmental aspects, legal issues and cost associated with solar energy will also be included. Cross listed with ERS 4050. *Prerequisites:* CHEM 1030 or CHEM 1060 and PHYS 1210 or PHYS 1310 and MATH 2200. (Offered spring semester)

**4100. Inorganic Chemistry Laboratory. 2.** Introduces basic inorganic laboratory synthetic techniques and methods of analysis. *Prerequisite:* CHEM 2440 and 4110 or concurrent enrollment. (Offered fall semester)

**4110. Introductory Inorganic Chemistry. 3.** A basic course on theoretical and descriptive inorganic chemistry. *Prerequisite:* CHEM 2420, and physical chemistry. (Normally offered fall semester)

**4230. Instrumental Methods of Chemical Analysis. 4.** Introduces optical, electro-analytical and separation methods of analysis, emphasizing practical industrial applications. *Prerequisite:* CHEM 2230. (Normally offered fall semester)

**4400. Biological Chemistry. 3.** Covers the main principles of biological chemistry from a chemical standpoint. Highlights the chemical structure of biological molecules and examines biological processes with emphasis on the underlying organic chemistry. Introduces biological NMR spectroscopy and other biophysical methods. Discusses main metabolic pathways. Dual listed with CHEM 5400. *Prerequisite:* CHEM 2440 or consent of instructor

**4507. Physical Chemistry I. 3.** First semester of a one-year sequence. Emphasis on introductory quantum mechanics, atomic structure, molecular bonding and structure and spectroscopy. Kinetic molecular theory of gasses may be introduced. Uses multivariable calculus, differential equations and some linear algebra. *Prerequisites:* one year of general chemistry, multivariable calculus, one year of general college physics. (Normally offered fall semester)

**4508. Physical Chemistry II. 3.** Second semester of a one year sequence, emphasizes kinetic theory of gasses and non-ideal solutions, chemical equilibrium, electrochemistry, statistical thermodynamics, and reaction kinetics. Uses multivariable calculus and differential equations. *Prerequisite:* CHEM 4507. (Normally offered spring semester)

**4515. Applied Mathematics in Physical Chemistry I. 3.** Designed to introduce the necessary mathematical background and essential computer programming tools for students of physical and theoretical chemistry. This includes an introduction into linear algebra, multivariate calculus, differential equations, analysis and modeling of experimental data, use of Matlab software and mathematical analysis of physical chemistry problems. Dual listed with CHEM 5515. *Prerequisites:* MATH 2200 and 2205, CHEM 1020/1030 or 1050/1060.

**4516. Applied Mathematics in Physical Chemistry II. 3.** Covers the advanced mathematical techniques in physical and theoretical chemistry. This includes introduction into probability and stochastic processes, infinite series, vector and tensor calculus, Fourier transforms and partial differential equations. Includes practical numerical problem solutions using MatLab software and applications of the mathematical analysis to specific physical chemistry problems. Dual listed with CHEM 5516. *Prerequisite:* CHEM 4515.

**4525. Physical Chemistry Lab I. 1.** Illustrates principles of physical chemistry, techniques of measurement, and analysis and interpretation of data with an emphasis on quantum mechanical (spectroscopic) methodologies. *Prerequisites:* CHEM 4507 or concurrent enrollment.

**4530. Physical Laboratory II. 1.** Illustrates principles of physical chemistry, techniques of measurement, and analysis and interpretation of data with emphasis on thermodynamic methodologies. Laboratory: 3 hours per week. *Prerequisites:* CHEM 4525 and CHEM 4508, or concurrent enrollment. (Normally offered spring semester)

**4560. Molecular Modeling - Computational Chemistry. 3.** Emphasizes training in computational, electronic and vibrational structure, calculations ranging from molecular mechanics to semi-empirical to ab-initio methods. Dual listed with CHEM 5560. *Prerequisite:* CHEM 4507. (Normally offered alternating spring semesters)

**4920. Special Problems in Chemistry. 1-3 (Max. 6).** Probes deeply into special areas of chemistry through library or laboratory work. Taken under supervision of faculty in the area of the investigation. Laboratory: 3-9 hours per week. *Prerequisite:* consent of instructor. (Offered every semester)

**4930. Undergraduate Research. 1-3 (Max. 9).** Research activities on a chemical project of limited scope or as part of a laboratory project of great scope. A written report is submitted to the department each semester of enrollment. Laboratory: 4-12 hours per week. *Prerequisites:* chemistry major and consent of instructor. (Offered every semester)

The following courses are offered for S/U credit only: CHEM 5000, CHEM 5150, CHEM 5190, CHEM 5290, CHEM 5310, CHEM 5390, CHEM 5501, CHEM 5590, CHEM 5790, CHEM 5900, CHEM 5920, CHEM 5940, CHEM 5960, CHEM 5980, and special sections of CHEM 5100, CHEM 5200, CHEM 5300, and CHEM 5500 offered during Summer Session.

**5000. Seminar in Chemistry. 1 (Max. 3).** All graduate students attend weekly departmental seminars. One credit given each semester a presentation is made, to a limit of 3 credits for M.S. candidate, 6 for Ph.D. candidates. The seminar will normally be based upon articles in the current chemical literature but with the last presentation being over the student's research project. Offered satisfactory/unsatisfactory only. *Prerequisite:* graduate standing in chemistry or biochemistry.

**5100. Special Topics in Advanced Inorganics. 1-9 (Max. 12).** A course designed for students with an interest in contemporary inorganic chemistry. Recent problems in the literature and techniques for their solution will be addressed.

**5111 [5110]. Advanced Inorganic Chemistry. 3.** A graduate-level course on theoretical and descriptive inorganic chemistry. Topics will include molecular symmetry, spectroscopy, electronic structure/bonding, magnetism, electron transfer, and catalysis. *Prerequisites:* CHEM 2420, CHEM 4110 and CHEM 3550 or 4507.

**5115. Descriptive Inorganic Chemistry. 3.** Advanced survey of inorganic chemistry, emphasizing the synthesis, structural, and reactivity properties of inorganic compounds. Emphasis will be placed on the application of bonding theory and periodic principles to the chemistry of main-group, d-block, and f-block elements. *Prerequisite:* CHEM 5110 or CHEM 5111.

**5120. Chemical Applications of Symmetry Group Theory. 3.** The essential principles of group theory as used by practicing chemists. Fundamentals of symmetry and the theory of groups. Applications to problems of spectroscopy, structure and bonding. *Prerequisite:* CHEM 4110 and either CHEM 4508 or 5530.

**5130. Physical Methods of Inorganic Chemistry. 1-3 (Max. 3).** A course to survey the spectroscopic methods (electronic, vibrational, rotational, magnetic resonance, quadrupole resonance, Mossbauer, mass) which are used to elucidate the structure and bonding in inorganic and organometallic compounds. *Prerequisite:* CHEM 4507 or 4110/5110.

**5140. Organometallic Chemistry. 3.** A survey of bonding and synthetic reactions of transition metal organometallic chemistry. *Prerequisite:* CHEM 4110/5110.

**5150. Inorganic Group Seminar. 1 (Max. 9).** Course designed for students with an interest in contemporary inorganic chemistry. Recent problems in the literature and techniques for their solution are addressed.

**5160. Bioinorganic Chemistry. 3.** Biological chemistry of metals and non-metals will be used to illustrate the fundamental role that they play in all aspects of life. Recent examples and problems in the current literature will be used to illustrate how chemically imposed restrictions and limitations are surmounted in living systems. *Prerequisite:* CHEM 4110/5110.

**5190. Research in Inorganic Chemistry. 1-3 (Max. 12).** Offered satisfactory/unsatisfactory only. *Prerequisite:* CHEM 4110/5110.

**5200. Special Topics in Analytical Chemistry. 1-6 (Max. 12).** Material selected from chromatography, electroanalytical chemistry, ion exchange, chemical separations, optical methods of analysis, polarography and other areas. *Prerequisite:* CHEM 4230, 4507, and 5210.

**5210. Advanced Survey of Chemical Analysis. 3.** A basic course to provide a background in many aspects of quantitative analysis taught at an advanced graduate-level. *Prerequisite:* CHEM 2230 and 4507.

**5220. Modern Electroanalytical Methods. 3.** An advanced survey of electroanalytical chemistry including ion selective potentiometry, electrolysis, coulometry, polarography and voltammetry. *Prerequisite:* CHEM 5210.

**5240. Optical Methods of Chemical Analysis. 3.** An advanced survey of the theory, instrumentation and applications of optical methods of chemical analysis. *Prerequisite:* CHEM 4230, 4507, 5210.

**5250. Advanced Chemical Instrumentation. 3.** Introduces chemistry students to the basic elements of electronics. Specific topics include networks, passive and active filters, digital electronics, logic gates, counters, flip-flops, and converters. Second half of course introduces students to experimental design, pattern recognition, factorial analysis, and multivariate statistical methods. *Prerequisite:* CHEM 4230 or its equivalent.

**5260. Separation Methods. 3.** A detailed survey of the theoretical and practical aspects of modern separation methods with emphasis on chromatography. *Prerequisite:* CHEM 2230, CHEM 2440, and CHEM 4508.

**5290. Research in Analytical Chemistry. 1-3 (Max. 12).** Satisfactory/unsatisfactory only. *Prerequisite:* CHEM 2230, 4507.

**5300. Special Topics Synthetic. 1-6 (Max. 9).** Material will be selected from one of the following areas: heterocycles, organometallics, natural products, physical and chemical methods of structure elucidation, organic photochemistry, and other special areas of organic chemistry. *Prerequisite:* CHEM 5330.

**5310. Organic Group Seminar. 1 (Max. 9).** Designed for students with an interest in organic reaction mechanisms. A problem solving approach using electron pushing techniques will be emphasized. *Prerequisite:* CHEM 5340.

**5320. Spectroscopic Methods of Structure Determination. 3.** Provides theoretical and practical treatment of spectroscopic methods for application in research. Topics include ultraviolet, infrared, and nuclear magnetic resonance spectroscopy and mass spectrometry. *Prerequisite:* CHEM 2440, 4507.

**5330. Advanced Organic Chemistry. 3.** Treatment of organic chemistry from the viewpoints of structure and mechanism with emphasis on structural theory of bonding, stereochemistry and the general classes of organic reactions. *Prerequisite:* CHEM 2440 and 4507.

**5340. Synthetic Methods in Organic Chemistry. 3.** Surveys and applies the important synthetic methods of organic chemistry with particular attention to recent developments. *Prerequisite:* CHEM 5330.

**5350. Advanced Organic Chemistry II. 3.** Second semester of a two semester sequence with a focus on the detailed mechanisms of the major classes of reactions of importance in organic chemistry. *Prerequisite:* CHEM 5330.

**5390. Research in Organic Chemistry. 1-3 (Max. 12).** *Prerequisite:* CHEM 5320.

**5400. Biological Chemistry. 3.** Covers the main principles of biological chemistry from a chemical standpoint. Highlights the chemical structure of biological molecules and examines biological processes with emphasis on the underlying organic chemistry. Introduces biological NMR spectroscopy and other biophysical methods. Discusses main metabolic pathways. Dual listed with CHEM 4400. *Prerequisite:* CHEM 2440 or consent of instructor.

**5500. Special Topics in Physical Chemistry. 1-6 (Max. 9).** Material will be selected from one of the following fields: electrochemistry, surface chemistry, catalysis, colloids, photochemistry, and other special fields of physical chemistry. *Prerequisite:* CHEM 4507 and 5510.

**5501. Physical Group Seminar. 1-9 (Max. 9).** Designed for students with an interest in theoretical and experimental physical chemistry. Students are required to give presentations on current literature and research topics. *Prerequisite:* graduate standing.

**5515. Methods of Applied Mathematics in Physical Chemistry I. 3.** Designed to introduce the necessary mathematical background and essential computer programming tools for students of physical and theoretical chemistry. Includes an introduction into linear algebra, multivariate calculus, differential equations, analysis and modeling of experimental data, use of Matlab software, and mathematical analysis of physical chemistry problems. Dual listed with CHEM 4515. *Prerequisites:* MATH 2200 and 2205, 1 yr. CHEM 1020/1030 or 1050/1060.

**5516. Applied Mathematics in Physical Chemistry. 3.** Covers the advanced mathematical techniques in physical and theoretical chemistry. This includes an introduction into probability and stochastic processes, infinite series, vector and tensor calculus, Fourier transforms and partial differential equations. Includes practical numerical problem solutions using Matlab software and applications of the mathematical analysis to specific physical chemistry problems. Dual listed with CHEM 4516. *Prerequisites:* CHEM 4515/5515.

**5520. Advanced Chemical Thermodynamics and Thermostatics. 3.** A rigorous presentation of classical chemical thermodynamics followed by an introduction to statistical mechanics with the application to real systems. *Prerequisite:* CHEM 4508 and 4507.

**5530. Quantum Chemistry. 3.** The quantum mechanical description of time-dependent and independent processes, including discussions of the Schrodinger equation, wave packets, approximate methods, and interaction of matter with radiation. *Prerequisite:* two semesters of undergraduate physical chemistry.

**5540. Molecular Spectroscopy. 3.** Introduction to the relationships among quantum mechanical formulations, experimentally determinable quantities obtained via spectroscopic methods, and physical parameters related to the structure of molecular systems. *Prerequisite:* CHEM 5530.

**5550. Chemical Kinetics and Reaction Dynamics. 3.** Emphasizes the rates and mechanisms of chemical reactions and reaction dynamics which reviews the kinetic theory of gases, conventional transition state theory, Arrhenius theory, applications of Laplace transforms, thermodynamics of the transition state, reactions in solution and on surfaces, and other current topics as time permits. *Prerequisite:* CHEM 4507.

**5560. Molecular Modeling - Computational Chemistry. 3.** A course that emphasizes training in computational, electronic and vibrational structure, calculations ranging from molecular mechanics to semi-empirical to ab-initio methods. Dual listed with CHEM 4560. *Prerequisite:* CHEM 4507.

**5570. Statistical Mechanics. 3.** Course content will include Maxwell-Boltzmann statistics, ensembles, partition functions, transition state theory, thermodynamic perturbation techniques, quantum statistics, and time-correlation formalism. *Prerequisites:* CHEM 4508 and 4507 and MATH 2205.

**5590. Research in Physical Chemistry. 1-3 (Max. 12).** *Prerequisite:* CHEM 4507.

**5760. Polymer Chemistry. 3.** A course covering the principles of polymer synthesis and characterization. *Prerequisite:* CHEM 2230, 2340, 4507.

**5790. Research in Biological Chemistry. 1-3 (Max. 12).** *Prerequisite:* consent of instructor.

**5820. Advanced Problems in Chemistry. 1-3 (Max. 3).** A graduate level course for students desiring to probe more deeply into a special area of chemistry. Taken under the supervision of a faculty member in the field of investigation. *Prerequisite:* consent of instructor.

**5900. Practicum in College Teaching. 1-3 (Max 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrolled in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisites:* enrolled in a graduate level degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

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## Chicano Studies

Please see *Latina/o Studies* on page 261.

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## Communication and Journalism

428 Ross Hall, 766-3122/6277

FAX: (307) 766-5293

Web site: [www.uwyo.edu/COJO](http://www.uwyo.edu/COJO)

Department Chair: Ken Smith

### Professors:

**MICHAEL R. BROWN**, B.A. Wayne State College 1974; M.A. University of Wyoming 1984; Ph.D. University of Utah 1994; Professor of Communication and Journalism 2007, 1994.

**TRACEY OWENS PATTON**, B.A. Colorado State University 1993; M.A. 1996; Ph.D. University of Utah 2000; Professor of Communication and Journalism 2012, 2003.

**CONRAD SMITH**, B.S. Ohio State University 1969; M.A. 1971; Ph.D. Temple University 1981; Professor of Communication and Journalism 1996.

**KENNETH L. SMITH**, B.S. Iowa State University 1970; M.S. 1973; Ph.D. University of Utah 1991; Professor of Communication and Journalism 2005, 1991.

### Associate Professors:

**CHIA FANG HSU**, B.A. Chinese Culture University 1995; M.A. Washington State University 1997; Ph.D. Washington State University 2002; Associate Professor of Communication and Journalism 2009, 2003.

**CINDY J. PRICE-SCHULTZ**, B.A. University of Sioux Falls 1989; M.S. South Dakota State University 1992; Ph.D. Southern Illinois University 2000; Associate Professor of Communication and Journalism 2008, 1999.

**Assistant Professors:**

**KRISTEN D. LANDREVILLE**, B.S. University of Florida 2004; M.A. 2006; Ph.D. Ohio State University 2010; Assistant Professor of Communication and Journalism 2010.

**LEAH LEFEBVRE**, B.A. University of Wisconsin-LaCrosse 2005; M.A. University of Wisconsin-Milwaukee 2007; Ph.D. University of Texas-Austin 2014; Assistant Professor of Communication and Journalism 2014.

**LI LI**, B.A. Hebei Normal University 2001; M.A. China University of Mining and Technology 2004; M.A. Ohio State University 2009; Ph.D. 2012; Assistant Professor of Communication and Journalism 2012.

**Senior Lecturers:**

**BEAU BINGHAM**, B.S. Idaho State University 2000; M.A. New Mexico State University 2002; Senior Lecturer of Communication and Journalism 2007, 2003.

**ERIC WILTSE**, B.A. State University College at Buffalo 1974; M.A. University of Montana 1983; Ph.D. University of Wyoming 2000. Publisher of *Laramie Online*; Senior Lecturer of Communication and Journalism 2001, 1990.

**Associate Lecturer:**

**JUSTIN STEWART**, B.A. University of Wyoming 2003; M.A. 2005; Associate Lecturer of Communication and Journalism 2012, 2005.

**Assistant Lecturer:**

**TRAVIS J. CRAM**, B.A. University of Wyoming 2007; M.A. University of Kansas 2010; Assistant Lecturer of Communication and Journalism 2012.

**Emeriti:**

B. Wayne Callaway, William C. Donaghy, George A. Gladney, John W. Ravage

The Department of Communication and Journalism provides a broad range of professional and research courses, offering a sound interdisciplinary academic program for students who plan careers in communication or mass media. Courses are comprised of writing, speaking and analyzing messages; forms of interpersonal communication; mass media effects and audiences' interpretations of media messages and images. Degrees are granted in communication and journalism with academic specialties in each of the degree areas. Students are given academic preparation in communication skills (media writing and

public speaking), coupled with opportunities for professional experience in their majors. The department also offers minors in public relations, communication and journalism for non-majors.

**Marketing, Facilities and Research Activities**

The department encourages majors to work actively in print media. The department offers unique professional opportunities for students with the student newspaper, *The Branding Iron*.

**Oral Communication Center, Ross Hall 442.**

A resource for the entire University Community. The lab is open for anyone required to present material orally. Lab instructors offer assistance at any stage in the process—from topic selection, purpose statements and gathering materials—to organizing, outlining and rehearsal. They can help alleviate speech anxiety that may prevent or inhibit some individuals from achieving their overall academic or career goals. Clients can have their presentations video-taped for critical input and evaluation as well as for portfolio or interview applications.

**Forensics.** The department conducts a nationally recognized program of Cross Examination Debate Association (CEDA). Teams and individuals representing the university attend national intercollegiate tournaments each year. Participation in the forensics program is open to all University of Wyoming students on a credit (COJO 2060) or non-credit basis.

**Laboratories.** The department has computer and research laboratories that support the professional, academic and research programs. These include a computer lab, photojournalism studio, and digital (audio and video) production lab.

**Research.** The department encourages undergraduate and graduate research. Faculty and students participate in research projects in social, cultural and political aspects related to mass media, interpersonal and organizational processes.

**Internships.** Journalism majors are required to complete internships in their field. Communication majors are encouraged to complete internships in their field. In addition to working with the *Branding Iron*, students complete internships with state, regional, and national weekly and daily newspapers; advertising and public relations agencies; non-profit organizations; businesses, professional and university sports organizations; and governmental agencies. *Note:* a maximum of 6 hours

in COJO 3480 and 4990 count as fulfillment of the requirements for a major. All remaining hours will count toward graduation as upper-division hours.

**Student Organizations**

**Professional Organizations.** The department has chapters of the Society of Professional Journalists and Delta Sigma Rho, the national forensics honorary, and Lambda Pi Eta.

**Student Activity.** Within the department, student representatives participate on faculty committees where they assist in forming policies of the department.

**The Branding Iron.** The daily campus newspaper is independently managed by students at UW. It provides professional experiences for reporting, editorial, photojournalism, publication design and advertising.

**The Owen Wister Review.** The literary and arts magazine is independently managed and produced by university students, it features poetry, short stories, essays, photography and artwork.

**Frontiers Magazine.** The magazine is independently managed by UW students. Containing general interest content, the publication offers students opportunities to improve their professional skills in feature writing, in-depth reporting, photography, layout, design, advertising and marketing. Like the *Branding Iron* and *Owen Wister Review*, *Frontiers* is published under the auspices of UW Student Publications.

**Scholarships and Awards**

The department has several scholarships available to qualified students. Check the Communication and Journalism web site for additional information.

**Undergraduate Programs**

The department offers courses leading to baccalaureate degrees in communication and journalism.

Students majoring in the department are required to earn a grade of C or better in departmental required courses. Students may not take a course for S/U credit to satisfy requirements of the major.

**Departmental Core Courses**

In addition to the university studies requirements listed in this *Catalog*, all students majoring in communication and journalism must take the following required courses:



<b>Required Courses</b>	<b>Hrs.</b>
COJO 1000 Intro to Mass Media .....	3
COJO 2010 Public Speaking .....	3
COJO 2100 Reporting & Newswriting.....	3
STAT 2070 Intro to Statistics for the Social Sciences .....	4
(This course is a prerequisite for COJO 3070)	
COJO 3070 Intro to Comm Resrch.....	3
Language 1010 .....	4
Language 1020 .....	4

<b>College of Arts and Sciences Requirements</b>	<b>Hrs.</b>
A&S U.S. Diversity (ASD).....	3
A&S Global Awareness (ASG) .....	3

**Communication Major**

Communication is a liberal arts degree relevant to a variety of careers in community relations, public relations, politics, administration, law, sales management and human resource management.

**Bachelor of Arts in Communication**

<b>Required Courses</b>	<b>Hrs.</b>
Departmental core courses.....	30
COJO 1040 Intro to Human Comm.....	3
COJO 3010 Business/Prof Comm .....	3
COJO 3040 Advanced Comm Thry.....	3
Electives .....	15
(At least 12 elective hours must be at the 3000-level or higher)	

<b>Additional Program Requirements</b>	<b>Hrs.</b>
Human Culture (H) .....	6

**Bachelor of Science in Communication**

<b>Required Courses</b>	<b>Hrs.</b>
Departmental core courses.....	30
COJO 1040 Intro to Human Comm.....	3
COJO 3010 Business/Prof Comm .....	3
COJO 3040 Advanced Comm Thry.....	3
Electives .....	15
(At least 12 elective hours must be at the 3000-level or higher)	

<b>Additional Program Requirements</b>	<b>Hrs.</b>
Physical and Natural World (PN) or Quantitative Reasoning (Q) .....	6-8

**Journalism Major**

The journalism major is designed to prepare students for careers as reporters, editors and writers with urban newspapers, community newspapers, news services, magazines, public information, public relations and advertising.

**Bachelor of Arts in Journalism**

<b>Required Courses</b>	<b>Hrs.</b>
Departmental core courses.....	30
COJO 3530 Online Journalism.....	3
COJO 4500 Mass Communication Law.....	3
COJO 3480 Internship .....	3
Departmental electives .....	15
(Includes 9 elective hours at the 3000-level or higher in journalism, plus 3 elective hours at the 3000-level or higher outside the department)	

<b>Additional Program Requirements</b>	<b>Hrs.</b>
Human Culture (H) .....	6

**Bachelor of Science in Journalism**

<b>Required Courses</b>	<b>Hrs.</b>
Departmental core courses.....	30
COJO 3530 Online Journalism.....	3
COJO 4500 Mass Communication Law.....	3
COJO 3480 Internship .....	3
Departmental electives .....	15
(Includes 9 elective hours at the 3000-level or higher in journalism, plus 3 elective hours at the 3000-level or higher outside the department)	

<b>Additional Program Requirements</b>	<b>Hrs.</b>
Physical and Natural World (PN) or Quantitative Reasoning (Q) .....	6-8

**Suggested Specialty Areas in Journalism**

<b>Reporting &amp; Editing</b>	<b>Hrs.</b>
COJO 3100 Public Affairs Reporting.....	3
COJO 4100 Investigative Reporting.....	3
COJO 4110 Feature Writing Seminar .....	3
COJO 4120 News Editing .....	3

<b>Advertising &amp; Public Relations</b>	<b>Hrs.</b>
COJO 3300 Advertising in the Media .....	3
COJO 3310 Public Relations .....	3
COJO 4300 Advertising Campaigns.....	3
COJO 4310 Public Relations Techniques.....	3

<b>Media &amp; Society</b>	<b>Hrs.</b>
COJO 3000 History of American Journalism .....	3
COJO 3470 History of Documentary Film...3	
COJO 3520 Communication Technology & Society .....	3
COJO 3550 Political Communication .....	3
COJO 4000 News Making Processes .....	3
COJO 4020 Mass Media & Society.....	3
COJO 4230 Special Topics in Mass Media ...3	
COJO 4233 Race, Gender, Ethnicity in the Media .....	3
COJO 4600 Mass Media Ethics.....	3
COJO 4800 Media Management.....	3

**Visual & Multimedia**

COJO 2400 Introduction to Photography....	3
COJO 3170 Broadcast Journalism .....	3
COJO Graphics of Communication .....	3
COJO 4200 Visual Communication .....	3
COJO 4270 Advanced Television Production .....	3
COJO 4280 Advanced Radio Production.....	3
COJO 4400 Photojournalism.....	3
COJO 4530 Advanced New Media .....	3

**Minors**

The department offers minors in public relations, journalism, communication, and marketing communication for non-majors. For further information, contact the Department of Communication and Journalism.

**Graduate Study**

The Department of Communication and Journalism offers graduate work leading to the master of arts degree in communication (either Plan A or Plan B) with emphasis on human communication or mass communication.

The graduate curriculum addresses six major areas of inquiry in human communication: 1) the structure and function of contemporary epistemological, ontological, theoretical, and methodological paradigms in the communication discipline; 2) theories of language and nonverbal symbolic interactions; 3) communication processes in small group and organizational settings; 4) communication as an agent of stability and change in diverse social systems; 5) the role assumed by communication processes in the formation, development, and coordination of intimate human relationships; and 6) the nature and function of argumentative discourse in democratic societies.

The master's program in the mass media addresses media issues and problems from a theoretical perspective. The program is designed to be flexible such that students can examine questions that relate to their specific interests in the media. Areas of interest include but are not limited to print media, broadcasting, advertising, public relations, visual communication, media law and regulation, media management, media effects, mass media and society, media history, or media ethics.

**Program Specific Admission Requirements**

A cumulative minimum grade point average of 3.0 (A=4.0) on previous coursework is required for full admission.

Composite score minimum of 900 on the verbal and quantitative sections of the Graduate Record Examination (GRE).

For international students the university requires a minimum total score of 540 on the written exam or 76 on the Internet-based exam. The university will also accept a minimum score of 6.0 on the IELTS exam or certification of level 112 ELS completion in lieu of the TOEFL requirement.

## Program Specific Degree Requirements

Administered by the Director of Graduate Studies, the programs are structured to facilitate completion of requirements for the M.A. degree in two years. Deficiency makeups may be required.

### Master of Arts Plan A (thesis)

31 hour program.

Students must complete an accepted master's thesis approved by the student's thesis committee.

Students must complete a minimum of 27 credit hours and 4 hours of thesis. A minimum of 21 hours must be within the department, with a maximum of 3 hours of independent study and 3 hours of 4000-level coursework. A student also must take 3 hours of a 5000-level statistics course approved by the department's director of graduate studies.

For courses taken outside the department, a student may be credited with no more than 3 hours of 4000-level coursework and 3 hours of independent study.

Students must complete COJO 5070, 5080, and 5800 as well as one of the following theory courses, COJO 5310, 5540 or 5061.

### Plan B (non-thesis)

Students must complete an accepted Plan B paper(s) (or project(s) if something other than an actual paper, e.g., film script, film documentary), and this must be developed as part of a 3 hour independent study approved by the student's Plan B adviser and the department's director of graduate studies.

The non-thesis degree requires a minimum of 33 credit hours, of which a minimum of 21 hours must be within the department. The non-thesis student is limited to 6 4000-level credit hours and a maximum of 6 credit hours of independent study or internship.

Students must complete COJO 5070, 5080, and 5800 as well as one of the following theory courses, COJO 5310, 5540 or 5061.

## Communication and Journalism (COJO)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀Q]).

**1000 [CMJR 1000; CO/M 1000]. Introduction to Mass Media. 3. [CS◀H]** An overview of mass media, newspapers, magazines, books, radio, television and films. Studies mass media's historical development, emphasizing understanding techniques of expression and impact on American culture. Surveys content of mass media; considers contemporary problems and trends. (Offered fall and spring semesters)

**1001 [CMJR 1001]. Issues in the Mass Media. 1. [I,L◀(none)]** An examination of important, relevant, and timely issues as they relate to the mass media. *Prerequisite:* concurrent enrollment in COJO 1000.

**1020 [CMJR 1020]. Communication and Civic Engagement. 3. [O◀(none)]** Designed to complement a course from another discipline by engaging students in civic discourse within that context. Students identify issues, study related rhetorical strategies, determine target audiences and develop communication with a venue and target audience to be determined by the class.

**1030 [CMJR 1030; CO/M 1030]. Interpersonal Communication. 3. [(none)◀H]** Focuses on interpersonal communication settings or face-to-face interaction. Basic unit of study is, therefore, the dyad. Also includes some work in small group settings. (Offered fall and spring semesters)

**1040 [CMJR 1040; CO/M 1040]. Introduction to Human Communication. 3. [CS◀(none)]** Introduces theories and research of social and behavioral scientists on communication process. Orients beginning communication students by focusing on concepts and issues central to human communication. (Normally offered fall and spring semesters)

**1041 [CMJR 1041]. Issues in Human Communication. 1. [I,L◀(none)]** An examination of important, relevant, and timely issues as they relate to the theoretical base of human communication. *Prerequisite:* concurrent enrollment in COJO 1040.

**1101. First-Year Seminar. 3. [(none)◀FYS]**  
**2010 [CMJR 1010; CO/M 1010; COJO 1010]. Public Speaking. 3. [O◀COM2]** Beginning public speaking course. Students will develop foundational oral, digital and writing communication skills. Emphasizes message construction, performance and critique in pub-

lic communication settings. Includes speech preparation, listening, audience analysis, writing strategies, digital communication, critical thinking, language/nonverbal behavior and various speaking formats. *Prerequisite:* Successful completion of a COM1 course.

**2060 [CMJR 2060; CO/M 2060]. Forensics Practicum. 1 (Max. 8).** *Prerequisite:* consent of forensics director. (Offered fall and spring semesters)

**2090 [CMJR 2090; CO/M 2090]. Persuasion. 3.** Studies human communication as a change agent. Emphasizes relationships of attitudes to behavior, behavioral research and contemporary theories. *Prerequisite:* COJO 1030 or 1040. (Offered fall semester)

**2100 [CMJR 2100; CO/M 2100, 1100]. Reporting and Newswriting. 3. [WB◀(none)]** Beginning newswriting. Practices development of news sources, selection and information organization. Variations in types of news. Covers development and trends of journalistic forms. Intensive practice in gathering and writing news. *Prerequisite:* WA writing course. (Offered fall and spring semesters)

**2150 [CMJR 2150; CO/M 2150]. Argumentation. 3.** Studies argumentation principles. Emphasizes reasoning, evidence, case construction and effective presentation in bringing about belief and conviction. Practical applications by participation in debates on various social and political questions. *Prerequisite:* COJO 1040. (Offered spring semester of even-numbered years)

**2400 [CMJR 2400; CO/M 2400]. Introduction to Photography. 3. [CA◀(none)]** Basic course in still photography. Includes laboratory practice in techniques of camera use, composition, processing and use of photographs. (Offered fall, spring and summer)

**3000 [CMJR 3000; CO/M 3000]. History of American Journalism. 3.** Presents history and development of American journalism from colonial times to present, emphasizing 20th century. *Prerequisite:* COJO 1000. (Offered spring semester of even-numbered years)

**3010 [CMJR 3010; CO/M 3010]. Business and Professional Communication. 3. [(none)◀COM3]** Studies theories and techniques of professional communication activities including interviewing skills, group processes, and professional presentations; for students who are beyond elementary oral communication level. Students develop oral communication skills through projects and presentations. *Prerequisite:* COJO 1010 or COJO 2010 and junior standing. (Offered fall and spring semesters)

**3040 [CMJR 3040; CO/M 3040]. Advanced Communication Theory. 3.** Considers nature of human communication theories. Analyzes problems in developing communication theory based on current social science methods. *Prerequisites:* COJO 1000 and COJO 1040. (Offered fall semester)

**3070 [CMJR 3070; CO/M 3070]. Communication Research. 3.** Focuses on problems in communication and mass communication research. Specifically studies and applies language of science, basic concepts of communication, mass communication research, types and limitations of empirical research, as well as measurement procedures and analysis. *Prerequisites:* COJO 1000 or 1040 and STAT 2050 or 2070. (Offered fall and spring semesters)

**3100 [CMJR 3100; CO/M 3100]. Public Affairs Reporting. 3.** Practices in public affairs reporting, emphasizing local and state political organization as foundation for such reporting. Specialized reporting fields. News analysis. *Prerequisite:* COJO 2100. (Offered fall semester)

**3160 [CMJR 3160; CO/M 3160]. Theory of Language and Society. 3. [WC♦(none)]** Considers contributions to communication theory from linguistics, sociolinguistics, sociology, social psychology and anthropology to understanding a spoken language. *Prerequisites:* COJO 1040 and 6 additional hours in the department. (Offered spring semester)

**3170 [CMJR 3170; CO/M 3170]. Broadcast Journalism. 3.** An overview of the techniques of broadcast news professionals, to report and deliver stories on-air. Includes intensive practice in writing, reporting and reading news stories for radio and television. *Prerequisite:* COJO 2100. (Offered based on demand and resources)

**3190 [CMJR 3190; CO/M 3190]. Cross-Cultural Communication. 3. [D♦COM3]** Studies human communication processes within the context of various cultures and subcultures. Opportunity for field study of the effect of culture on communication behavior. *Prerequisite:* COJO 1040. (Offered fall semester)

**3200 [CMJR 3200; CO/M 3200]. Graphics of Communication. 3. [CA♦(none)]** Combines editing and design. Studies evaluation, selection and editing of magazine and newspaper news copy. Practice in publication design, including headline writing, printing methods, page layout and other display techniques. *Prerequisite:* COJO 1000. (Offered fall semester)

**3300 [CMJR 3300; CO/M 3300]. Advertising in the Media. 3.** Studies fundamentals of copywriting in mass communication. Provides study and practice in the psychology of advertising, audience direction, advertising appeals, strategy, and structure of ads and com-

mercials. Includes exercises in basic principles of copywriting for print and electronic media. *Prerequisite:* COJO 2100. (Offered fall semester)

**3310 [CMJR 3310; CO/M 3310]. Public Relations. 3.** Studies mass media effects on audiences and audiences' involvement in and interpretation of mass media content. Discusses public opinion and mass media concepts as conceptual framework for public relations, advertising and other public information fields. *Prerequisite:* COJO 2100 and junior standing. (Offered fall semester)

**3470 [CMJR 3470; CO/M 3470]. History of Documentary Film. 3.** Provides history and overview of origin, development and evolution of documentary films, focusing on U.S., British and Canadian films. Examines documentary function, form, production techniques, as well as present and future role in the global community. *Prerequisites:* COJO 1000 and junior standing. (Offered based on demand and resources)

**3480 [CMJR 3480; CO/M 3480]. Internship. 1-12 (Max. 12).** Review and evaluation of approved internship experience. At the conclusion, students must submit a journal containing work samples and a critique of their performance and internship experience. Maximum of 6 hours of internship credit can be used to fulfill requirements of the major. *Prerequisites:* signed contract and 9 hours in the department. (Offered fall, spring and summer)

**3520 [CMJR 3520; CO/M 3520]. Communication Technology and Society. 3.** Studies role of communication technology in functioning of society. Examines history of effects on personal growth, self-concept, world view, creative thinking, personal relationships and social processes. *Prerequisite:* COJO 1000 or 1040. (Offered spring semester)

**3530 [CMJR 3530; CO/M 3530]. Online Journalism. 3.** How to produce content for online media and use the web as a tool for mass media work. Course provides experience in designing web pages, writing for hypermedia and digital imaging; covers history, ethical issues and trends in online journalism, photography, broadcasting, public relations and advertising. *Prerequisite:* COJO 2100 or other instructor approved WB course. (Offered fall and spring semesters)

**3550. Political Communication. 3.** Examines the intersection of politics and communication. For example, may cover politics and media, interpersonal political discussion, organizational and governmental political communication, political campaigns, politics and technology, etc. Moreover, it may cover the effects of political communication on in-

dividuals' opinions and behavior. Cross listed with POLS 3550. *Prerequisites:* COJO 1000, COJO 1040, or POLS 1000.

**4000 [CMJR 4000; CO/M 4000]. News-Making Processes. 3.** The study of the processes underlying the production of news in the mass media with special emphasis on how those processes affect the news and have an impact on society. Examines the function of news, values, and objectivity in the news, outside influences, and news as entertainment. Dual listed with COJO 5000. *Prerequisites:* COJO 1000 and 9 hours in the department.

**4020 [CMJR 4020; CO/M 4020]. Mass Media and Society. 3.** Studies ethical and related problems of mass communication from contemporary and historical viewpoints. Critical analysis of the performance of the mass media. *Prerequisites:* COJO 1000 or 1040 and 6 hours in the department. (Offered spring semester)

**4030 [CMJR 4030; CO/M 4030]. Advanced Interpersonal Communication. 3.** Studies research and theory in interpersonal relationships; formation and maintenance of friendships; marriages; and group relationships. *Prerequisites:* COJO 1040 and 6 hours in the department. (Offered fall semester of odd-numbered years)

**4050 [CMJR 4050; CO/M 4050]. Communication and Conflict. 3.** Studies research and theory concerning communication in conflict development and management. Examines forms of conflict, including occurrences in interpersonal, group, organizational and cultural contexts. *Prerequisites:* COJO 1000 or 1040 and 6 hours in the department. (Offered fall semester of even-numbered years)

**4061. Rhetorical Theory and Criticism. 3.** An investigation into how rhetorical theory, spanning from its ancient roots in Aristotelian thinking to its current postmodern components, operates in society. Explores how various critical methods can be utilized to gain a stronger understanding of public communication texts, including newspapers, speeches, music and film. Cross listed with ENGL 4061; dual listed with COJO 5061. *Prerequisites:* COJO 1040 and junior standing. (Offered spring semester of even-numbered years)

**4100 [CMJR 4100; CO/M 4100]. Investigative Reporting. 3. [WC♦(none)]** Practices developing and writing articles of depth and substance in areas of public concern. Emphasizes careful research, weighing conflicting viewpoints, interpreting complex issues and critical evaluation. *Prerequisite:* COJO 3100. (Offered spring semester of even-numbered years)

**4110 [CMJR 4110; CO/M 4110]. Feature Writing Seminar. 3. [WC◀COM3]** Extensive practice in such specialized forms of writing as editorials, commentaries, reviews and magazine articles. Content varies. Critically analyzes such writing. *Prerequisites:* COJO 2100 and 6 hours in the department. (Offered fall semester)

**4120 [CMJR 4120]. News Editing. 3.** Students develop skills in editing copy for newspapers and magazines. Focus is on copy editing for grammar, syntax, style, clarity, spelling, word usage, fairness and balance, conciseness, and accuracy. Students also learn to write effective headlines and cutlines, do effective design and layout of tabloid and broadcast pages, and create effective information graphics and photo features. *Prerequisite:* COJO 2100. (Offered spring semester of even-numbered years)

**4140 [CMJR 4140; CO/M 4140]. Nonverbal Communication Studies. 3.** Critical analysis of current studies in the area of nonverbal communication. Students are required to complete an independent study of some aspect of nonverbal communication relevant to interests. Dual listed with COJO 5140. *Prerequisites:* junior standing. (Offered spring semester of even-numbered years)

**4160. African American Rhetoric. 3. [CH,D◀COM3]** African American discourse and its relationship to equality and participation. Through examination of various media, music, speeches, and art this course uses the struggle of African Americans as an instructive exemplar, to come to terms with the philosophical concepts, political issues, moral complexities, and discursive characteristics of African American Rhetoric. Dual listed with COJO 5160; cross listed with AAST 4160. *Prerequisites:* AAST 1000, any AAST 2000-level course, junior or senior standing, or nine credit hours in any level COJO course. (Offered fall semester of odd-numbered years)

**4190. Dimensions of Racism. 3.** Explores the effects of racism on African people in America using an African centered framework. We will look at the ways racism intersects with sexism, classism, and heterosexism/homophobia within the African community both in America and throughout the Diaspora. Dual listed with COJO 5190; cross listed with AAST 4190. *Prerequisites:* AAST 1000, any AAST 2000-level course, junior or senior standing, or nine credit hours in any level COJO course.

**4200 [CMJR 4200; CO/M 4200]. Visual Communication. 3.** Studies principles of vision that help explain how humans process information. Content includes perception, organization of information, spatial factors, cultural factors, motion, vectors and color.

Specifically emphasizes visual processing of information relating to mass media. *Prerequisite:* COJO 1000. (Offered spring semester of odd-numbered years)

**4210 [CMJR 4210; CO/M 4210]. Special Topics in Communication. 1-3 (Max. 6).** Intensive study of such special problems and topics in human communication processes as gender relations, power dynamics, family and political communication. Content varies. Dual listed with COJO 5210. *Prerequisites:* COJO 1040 and 9 hours in the department.

**4230 [CMJR 4230; CO/M 4230, 4910]. Special Topics in Mass Media. 1-3 (Max. 6).** Intensive study of problems and topics specific to the mass media, including print, broadcast, advertising, public relations, and the Internet. Course content varies and may include historical, legal, ethical, political, sociocultural, economic, and theoretical perspectives. Dual listed with COJO 5230. *Prerequisites:* COJO 1000 and 9 hours in the department.

**4233. Race, Gender, Ethnicity in the Media. 3. [WC,D◀COM3]** Examine the role mass media plays in the Black community and other racial, ethnic, gendered, and socioeconomic communities. Students will develop a critical understanding of the way the mass media uses stereotypes and prejudice to influence society's views about ethnic minorities and women in contemporary United States society. Cross-listed with AAST 4233 and WMST 4233; dual-listed with COJO 5233. *Prerequisites:* AAST 1000, any AAST 2000-level course, or three hours of any level of WMST courses, or three hours of any level COJO courses; WB, and junior/senior standing.

**4250 [CMJR 4250; CO/M 4250]. Advanced Organizational Communication. 3.** Studies communication processes in political, educational, industrial, medical and nonprofit organizations. Emphasizes in-depth analysis of theories and methods of organizational research and practice. (Offered spring semester of even-numbered years)

**4260. [4985] Rhetoric and Social Justice. 3. [D◀COM3]** Analyzes concepts of ableism, anti-Semitism, heterosexism, racism, sexism, and socioeconomic class through a critical/social construction framework. It attempts to develop a "working" definition of these concepts by analyzing historical and current conceptualizations and identifying marginalization and disenfranchisement as it is woven in the fabric of American society. Dual listed with COJO 4260; cross listed with AAST 4260. *Prerequisites:* Minimum of 9 credit hours in AAST or COJO and junior standing. (Offered spring semester of even-numbered years)

**4270 [CMJR 4270; CO/M 4270]. Advanced Television Production. 3.** Studies details of directing, editing and single camera television production. Requires production of several original short television programs. *Prerequisite:* COJO 3270. (Offered spring semester)

**4280 [CMJR 4280; CO/M 4280]. Advanced Radio Production. 3.** Advanced project course in audio production work. Concentrates on production of high quality and professional sounding audio productions using voices, music and sound effects. Emphasis on creativity. *Prerequisite:* COJO 3280. (Offered spring semester)

**4300 [CMJR 4300; CO/M 4300]. Advertising Campaigns. 3.** Reviews current national, regional and local advertising practices in various media. Develops understanding of advertising agency and/or advertising department. Students prepare an advertising campaign using creative and marketing strategies on regional or national level. *Prerequisite:* COJO 3300. (Normally offered spring semester)

**4310 [CO/M 4310]. Public Relations Techniques. 3.** Practical application of public relations writing, planning and program implementation. Includes exercises in writing news releases, structuring news conferences and writing preliminary and formal public relations strategies. The plans also incorporate advertising and marketing segments for external publics, newsletter design, editing and interpersonal relations. *Prerequisite:* COJO 3310. (Offered spring semester)

**4400 [CMJR 4400; CO/M 4400]. Photojournalism. 3.** Studies and intensively practices reporting news and features photographically, plus essentials of advertising photography. Includes advanced camera and darkroom techniques and photo editing. Two one-hour lectures and one two-hour laboratory weekly. *Prerequisite:* COJO 2400. (Offered spring semester of even-numbered years)

**4500 [CMJR 4500; CO/M 4500]. Mass Communication Law. 3.** Studies development of First Amendment law. Includes practical application of law to mass media practice; relationship of legal and social responsibilities of the mass media; and problems of law and regulation, such as constitutional, statutory and administrative. *Prerequisites:* COJO 1000 and 2100. (Offered fall semester)

**4530. Advanced New Media. 3.** Addresses the theory and logistics of web design and online interactivity. Students will create and maintain a professional portfolio website that showcases their communication and design talents. It is applicable to journalism, public relations, advertising, marketing, photography, and any other media-related career path that

uses new media. Dual listed with COJO 5530. *Prerequisites:* COJO 1000 and 9 hours in the department. (Offered spring semester)

**4590 [CMJR 4590; CO/M 4590]. Advanced Persuasion. 3.** Participants in this seminar engage in dialog directed toward both (1) understanding the issues raised in contemporary persuasion research and (2) exploring potential solutions and ideas for future research. This seminar should prompt participants to begin their own research ventures designed to contribute to the study of communication and social influence. Dual listed with COJO 5590. *Prerequisites:* COJO 2090. (Offered spring semester of odd-numbered years)

**4600 [CMJR 4600; CO/M 4600]. Mass Media Ethics. 3.** Studies ethical theory, emphasizing how it can be applied to problem solving in the media. Examines major ethical perspectives and requires application to actual case studies. Dual listed with COJO 5600. *Prerequisite:* 6 hours at 3000-level in the department. (Offered spring semester of odd-numbered years)

**4620. Intergroup Communication. 3.** The course will provide an overview of theory and research on intergroup relations to demonstrate how communication both affects and reflects our social group memberships. The objective is to provide students with the theoretical foundation to view various contexts of communication through an “intergroup lens.” Dual listed with COJO 5620. *Prerequisite:* COJO 1000 or COJO 1400.

**4630 [CMJR 4630; CO/M 4630]. Ethics in Personal Relationships. 3.** Examines personal relationships and the ethical issues participants in these relationships encounter. Personal relationships are those unique relationships in which the participants cannot be replaced without altering the very nature of the relationship. Personal relationships are originated, developed, maintained and dissolved through communication between the participants. Dual listed with COJO 5630. *Prerequisite:* COJO 1030. (Offered fall semester of odd-numbered years)

**4800 [CMJR 4800; CO/M 4800]. Media Management. 3.** Discusses station and program orientation, market studies, law, policies, programming, public relations and public responsibilities. *Prerequisites:* COJO 2100 and 6 hours in the department. (Offered based on demand and resources)

**4990 [CMJR 4990; CO/M 4990]. Independent Study in Communication. 1-3 (Max. 6).** *Prerequisites:* 15 hours in the department and consent of department chair.

**5000. News-making Process. 3.** Study of the processes underlying the production of news in the mass media with special emphasis on how those processes affect the news and have an impact on society. Course examines the functions of news, values, and objectivity in the news, outside influences, and news as entertainment. Dual listed with COJO 4000. *Prerequisite:* graduate standing.

**5010. Texts of Mass Media. 3.** Intensive critical examination of the history, theory, social responsibility and empirical research in the production and consumption of mediated messages. *Prerequisite:* graduate standing.

**5030. Seminar in Interpersonal Communication. 3.** Intensive examination of contemporary theoretical perspectives and empirical research on interpersonal communication, including the role of communication in self-concept formation, social relationship development, and the structure and function of ordinary discourse in human interaction. Dual listed with COJO 4030. *Prerequisite:* graduate standing.

**5061. Rhetorical Theory and Criticism. 3.** An investigation into how rhetorical theory, spanning from its ancient roots in Aristotelian thinking to its current postmodern components, operates in society. Explores how various critical methods can be utilized to gain a stronger understanding of public communication texts, including newspapers, speeches, music and film. Cross listed with ENGL 5061; dual listed with COJO 4061. *Prerequisites:* COJO 1040 and 3040 or ENGL 2035.

**5070. Research in Communication I. 3.** Principles and problems of experimental research in human communication. Attention primarily on experimental design within laboratory and field settings. *Prerequisite:* graduate standing.

**5080. Research in Communication II. 3.** Principles and problems in quasi-experimental and naturalistic research in human communication. Attention primarily on the observation and systematic investigation of naturally occurring communicative events. *Prerequisite:* graduate standing.

**5140. Nonverbal Communication Studies. 3.** Critical analysis of current studies in the areas of nonverbal communication. Students are required to complete an independent study of some aspects of nonverbal communication relevant to interests. Dual listed with COJO 4140. *Prerequisites:* COJO 1040 or COJO 1000.

**5160. African American Rhetoric. 3.** African American discourse and its relationship to equality and participation. Through examination of various media, music, speeches, and art this course uses the struggle of African

Americans as an instructive exemplar, to come to terms with the philosophical concepts, political issues, moral complexities, and discursive characteristics of African American Rhetoric. Dual listed with COJO 4160; cross listed with AAST 5160. *Prerequisite:* AAST 1000, any AAST 2000-level course, junior or senior standing, or nine credit hours in any level COJO course.

**5190. Dimensions of Racism. 3.** Explores the effects of racism on African people in America using an African centered framework. We will look at the ways racism intersects with sexism, classism, and heterosexism/homophobia within the African community both in America and throughout the Diaspora. Dual listed with COJO 4190; cross listed with AAST 5190. *Prerequisites:* AAST 1000, any AAST 2000-level course, junior or senior standing, or nine credit hours in any level COJO course.

**5210. Special Topics in Communication. 1-3 (Max. 6).** Intensive examination of current theoretical issues in communication. Course content varies. Graduate students are expected to follow a rigorous reading schedule and submit a major paper or research project. Dual listed with COJO 4210. *Prerequisite:* graduate standing.

**5230. Special Topics in Mass Media. 1-3 (Max. 6).** Intensive study of problems and topics specific to the mass media, including print, broadcast, advertising, public relations and the internet. Course content varies and may include historical, legal, ethical, political, sociocultural, economic and theoretical perspectives. May dual list with COJO 4230. Graduate students are expected to follow a rigorous reading schedule and submit a major paper or research project. *Prerequisite:* graduate standing.

**5233. Race, Gender, Ethnicity in the Media. 3.** Examine the role mass media plays in the Black community and other racial, ethnic, gendered, and socioeconomic communities. Students will develop a critical understanding of the way the mass media uses stereotypes and prejudice to influence society’s views about ethnic minorities and women in contemporary United States society. Cross-listed with AAST 5233 and WMST 5233; dual-listed with COJO 4233. *Prerequisites:* AAST 1000, any AAST 2000-level course, or three hours of any level of WMST courses, or three hours of any level COJO courses; WB, and junior/senior standing.

**5250. Seminar In Organizational Communication. 3.** Intensive examination of the historical and contemporary theoretical approaches and empirical research in organizational dynamics. Attention primarily focuses

on how the institutionalized collective affects and is affected by other social systems. Dual listed with COJO 4250. *Prerequisite:* graduate standing.

**5260. [5985] Rhetoric and Social Justice. 3.** Analyzes concepts of ableism, anti-Semitism, heterosexism, racism, sexism, and socioeconomic class through a critical/social construction framework. Attempts to develop a “working” definition of these concepts by analyzing historical and current conceptualizations and identifying marginalization and disenfranchisement as it is woven in the fabric of American society. Dual listed with COJO 4260; cross listed with AAST 5260. *Prerequisite:* graduate standing.

**5310. Seminar in Mass Communications. 3.** The study of contemporary, historical, critical and behavioral theories of mass communication processes. Attention primarily on the social functions performed by mediated messages. *Prerequisite:* graduate standing.

**5530. Advanced New Media. 3.** Addresses the theory and logistics of web design and online interactivity. Students will create and maintain a professional portfolio website that showcases their communication and design talents. It is applicable to journalism, public relations, advertising, marketing, photography, and any other media-related career path that uses new media. Dual listed with COJO 4530. *Prerequisites:* COJO 1000 and 9 hours in the department.

**5540. Seminar in Communication Theory. 3.** An intensive examination of various metatheoretical assumptions and theoretical models used in the study of communicative dynamics. *Prerequisite:* graduate standing.

**5590. Seminar in Persuasion. 3.** Participants in this seminar engage in dialog directed toward both 1) understanding the issues raised in contemporary persuasion research and 2) exploring potential solutions and ideas for future research. This should prompt the participants to begin their own research ventures designed to contribute to the study of communication and social influence. Dual listed with COJO 4590. *Prerequisite:* COJO 2090 and 3070.

**5600. Mass Media Ethics. 3.** The study of ethical theory with special emphasis on how that theory can be applied to problem solving in the media. Examines major ethical perspectives and requires the application of those perspectives to actual case studies. Graduate students are expected to follow a rigorous project. Dual listed with COJO 4600. *Prerequisite:* graduate standing.

**5620. Intergroup Communication. 3.** The course will provide an overview of theory and research on intergroup relations to dem-

onstrate how communication both affects and reflects our social group memberships. The objective is to provide students with the theoretical foundation to view various contexts of communication through an “intergroup lens.” Dual listed with COJO 4620. *Prerequisite:* graduate standing.

**5630. Ethics in Personal Relationships. 3.** Examines personal relationships and the ethical issues participants in these relationships encounter. Personal relationships are those unique relationships in which the participants cannot be replaced without altering the very nature of the relationship. Personal relationships are originated, developed, maintained, and dissolved through communication between the participants. Dual listed with COJO 4630. *Prerequisite:* COJO 4030.

**5800. Foundations of Communication and Journalism. 3.** Examines current issues and trends in the various areas of communication and journalism that are represented within the department. Students analyze the historical roots of these issues and trends as a way of understanding the present context and future evolution of communication and journalism scholarship. *Prerequisites:* first year of graduate study and acceptance into the COJO graduate program.

**5890. Problems: Communication. 1-4 (Max. 6).** *Prerequisite:* 18 hours at the 5000 level in the department.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5961. Graduate Projects. 1-4 (Max. 4).** Limited to those students enrolled in a Plan B graduate program. Students should be involved in non-course scholarly activities in support of their Plan B project. *Prerequisites:* enrollment in Plan B program and departmental approval.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Criminal Justice

223 Arts and Sciences Building, 766-2988  
FAX: (307) 766-3913

Web site: [www.uwyo.edu/cj](http://www.uwyo.edu/cj)

Department Head: Adrienne Freng

### Professors:

**ADRIENNE B. FRENG**, B.A. Black Hills State University 1995; M.A. University of Nebraska 1997; Ph.D. 2001; Professor of Criminal Justice 2007, 2001.

**MARGARET M. MURDOCK**, B.A. Creighton University 1970; M.A. Tufts University 1975; Ph.D. 1978; Professor of Political Science and Criminal Justice – Casper 1993, 1975.

### Associate Professors:

**SCOTTE E. CULHANE**, B.A. University of Tennessee 1998; M.S. University of Tennessee at Chattanooga 2000; Ph.D. University of Texas at El Paso 2005; Associate Professor of Criminal Justice 2011, 2005.

**ERIC J. WODAH**, A.A. Eastern Wyoming College 1992; B.A. Chadron State College 1994; M.P.A. University of Wyoming 2003; Ph.D. 2007; Associate Professor of Criminal Justice 2008, 2012.

### Assistant Professors:

**JOHN H. BOMAN IV**, B.A. Ohio University 2007; M.A. University of Florida 2010; Ph.D. 2013; Assistant Professor of Criminal Justice 2013.

**THOMAS J. MOWEN**, B.S. University of Louisville 2011; Ph.D. University of Delaware 2015. Assistant Professor of Criminal Justice 2015.

### Assistant Lecturer:

**SHANE T. STONE**, B.S. Central Missouri State University 1992; M.S. Lindenwood University 2000; M.A. Midwestern Baptist College 2011; Assistant Lecturer of Criminal Justice 2012.

### Adjunct Professors:

(See Catalog section following name for academic credentials.)

**Robert A. Schuhmann**, political science

Students majoring in criminal justice will be involved in a critical examination of the sources of criminal behavior and the social and political institutions and processes designed to control criminal behavior. Criminal justice majors are offered at University of Wyoming campuses in Laramie and Casper, as well as through the Outreach School.

## Undergraduate Major

Students pursuing a B.A. in criminal justice must fulfill university studies and college requirements as listed in this Catalog, satisfy required prerequisites to courses in the major program, and complete a minimum of 39 credit hours in the major. Only courses in which a grade of C or better has been earned may be used to satisfy major requirements.

Foundation Courses:	Hrs.
CRMJ 1001.....	3
CRMJ 2210.....	3
CRMJ/SOC 2400.....	3
CRMJ 2685.....	3
CRMJ 3110.....	3
CRMJ 3200.....	3
CRMJ 3350.....	3
CRMJ 3490.....	3

Crime and Deviance (2 courses)	Hrs.
CRMJ 3150.....	3
CRMJ 3250.....	3
CRMJ 3500.....	3
CRMJ 4260.....	3
CRMJ 4700.....	3
CRMJ 4890.....	3

Criminal Justice Institutions & Processes (2 courses)	Hrs.
CRMJ 4130.....	3
CRMJ 4140.....	3
CRMJ 4150.....	3
CRMJ 4280.....	3
CRMJ 4860.....	3

### Supporting Courses

(1 course; or 1 additional course from Crime & Deviance or Criminal Justice Institutions & Processes):

	Hrs.
CRMJ/SOC 3320.....	3
CRMJ/SOC 3400.....	3
CRMJ/POLS 4110.....	3
CRMJ/ANTH 4230.....	3
CRMJ/SOC 4250.....	3
CRMJ 4270.....	3
CRMJ/PSYC 4370.....	3
CRMJ/SOC 4540.....	3
CRMJ/PSYC 4730.....	3
CRMJ/POLS 4600.....	3
CRMJ 4750.....	1-12
CRMJ/PSYC 4760.....	3
CRMJ 4965.....	1-6
CRMJ 4970.....	9-12
CRMJ 4975.....	1-3
CRMJ 4990.....	1-3

In addition to the above required courses, it is required that students take POLS 1000, STAT 2050 or 2070, one lab science, and two semesters of a foreign language.

## Forensic Science Concentration

The Criminal Justice Department offers a Forensic Science Concentration for Criminal Justice majors that consists of courses selected from several departments across the university. These inter-disciplinary courses are intended to provide a base knowledge of the field of forensic science for future educational and employment opportunities.

27 hours must be completed from among the following courses. Of these 27 hours, 14 must be upper division (3000 level or above) and 6 hours of elective coursework either from the Criminal Justice or the Forensic Science Concentration curriculum. Life Sciences 1010 and Chemistry 1020, General Chemistry I, must be taken to fulfill the University Studies Program lab science requirement.

### Analytical Techniques

(minimum 10 hours)

ANTH/CRMJ 4230 Forensic Anthropology or Anthropology or ANTH 4240 Forensic Anthropology Lab
CHEM 2230 Quantitative Analysis
CHEM 4230 Instrumental Methods of Chemical Analysis
CHEM 3550 Physical Chemistry for the Life Sciences or
CHEM 4507 Physical Chemistry I or
CHEM 4508 Physical Chemistry II
PATB 4140 Principles of Toxicology
MOLB 4170 Cloning & DNA Sequencing Laboratory
MOLB 4260 Quantitative Microscopy
MOLB 4400 Immunology
MOLB 4440 Microbial Genetics
MOLB 4490 Microbial Gene Expression Laboratory
ZOO 4425 Genetic Markers

### Human Biological Structure

(minimum 9 hours)

ANTH/CRMJ 4210 Human Osteology
LIFE 3050 Genetics
LIFE 3600 Cell Biology
CHEM 2300 Introduction to Organic Chemistry or
CHEM 2320 or 2420 Organic Chemistry I or
CHEM 2340 or 2440, Organic Chemistry II
CHEM/MOLB 3610 Principles of Biochemistry
MOLB 2240 Medical Microbiology
MOLB 3000 Intro to Molecular Biology
MOLB 4600 General Biochemistry I or
MOLB 4610 General Biochemistry II
ZOO/KIN 2040/2041 Human Anatomy
ZOO/KIN 3115 Human Systems Physiology

## Physics

(minimum 8 hours)

PHYS 1110 Physics I and  
PHYS 1120 Physics II

or

PHYS 1310 College Physics I and  
PHYS 1320 College Physics II

## Pre-Law Concentration

The Department of Criminal Justice offers a Pre-law Concentration for Criminal Justice majors that consists of courses selected from several departments across the university. These courses were chosen to help prepare students for the challenges of law school and the practice of law. Students electing the Pre-Law Concentration are urged to seek advising early.

Along with the 33 hours of criminal justice degree requirements, an additional 27 credit hours (18 of which must be 3000-level courses or above) must be earned for the Pre-Law Concentration.

## Verbal Comprehension and Expression

(Choose at least one course - min. 3 hours)

COJO 2090 Persuasion
COJO 2150 Argumentation
COJO 2260 Interviewing
COJO 3010 Business and Professional Communication
COJO 3160 Theory of Language and Society
COJO 4050 Communication and Conflict

## Written Comprehension and Expression

(Choose at least two courses-min. 6 hours)

ENGL 4000 21 <sup>st</sup> Century Issues in Professional Writing
ENGL 4010 Technical Writing in the Professions
ENGL 4020 Editing for Publication
ENGL 4780 History of the English Language
ENGL 4970 Writing Internship
ENGL/COJO 4061 Rhetorical Theory and Criticism

\*Course will be allowed to count for the concentration hours requirement.

## Critical Understanding of Human Institutions and Values

(Choose at least one course - min. 3 hours)

ECON 1020 Principles of Microeconomics
PHIL 2200 Social and Political Philosophy
PHIL 3250 Global Justice
PHIL 3300 Ethical Theory
PHIL 3350 History of Moral Philosophy
PHIL 3500 History of Science

PHIL/ENGL 3340 Philosophy of Literature (max. 3 hours)  
POLS 2460 Introduction to Political Philosophy  
POLS 3600 American Political Thought

### **Creative and Analytical Thinking**

*(Choose at least one course - min. 3 hours)*

ENGL 2050 Creative Writing - Intro to Fiction or  
ENGL 2060 Creative Writing - Intro to Non-Fiction (max. 3 hours) or  
ENGL 2070 Creative Autobiographical Writing (max. 3 hours) or  
ENGL 2080 Creative Writing - Intro to Poetry (max. 3 hours)  
PHIL 2420 Critical Thinking  
PHIL 3140 Philosophy of Science  
PHIL 3420 Symbolic Logic  
PHIL 3510 Introduction to Epistemology

### **World Cultures and International Institutions**

*(Choose at least one course - min. 3 hours)*

HIST 1320 World Civilizations to 1450  
HIST 1330 World Civilizations from 1450  
INST/BUSN 2000 Introduction to International Business  
POLS/INST 2310 Introduction to International Relations  
POLS/INST 4340 International Organizations  
ANTH 3420 Anthropology of Global Issues  
POLS/INST/SOC 4300 The World System  
INST/SOC 4370 Global Political Economy  
ECON/INST 4710 Comparative Systems

### **Electives**

*(Select courses from this list - maximum 3 courses or 9 hours)*

AMST 1030 Social Justice in the 21st Century  
ANTH 1200 Introduction to Cultural Anthropology  
ANTH/INST 4350 Culture Change  
CNSL 2200 Intro to Student Leadership  
CNSL 4520 Fundamentals of Counseling  
COJO 1030 Interpersonal Communication  
COJO 1040 Introduction to Human Communication  
COJO 3190 Cross-Cultural Communication  
COJO 4150 Legal Communication  
ECON 1000 Global Economic Issues  
LANG/ENGL 4750 Fundamentals of Linguistics  
LANG/ENGL 4770 Sociolinguistics  
PHIL 3440 Philosophy of the Mind  
POLS 4090 Anglo-American Jurisprudence  
POLS/INST 1200 Non-Western Political Cultures

STAT 2000 Statistics and the World or  
STAT 2050 Fundamentals of Statistics or  
STAT 2070 Introductory Statistics for the Social Sciences

### **Undergraduate Minor**

A minor in criminal justice requires 18 semester hours in criminal justice. All courses must be completed with a grade of C or better. The required courses are: CRMJ 1001, CRMJ 2210, CRMJ/SOC 2400, CRMJ 3110, CRMJ 3350, CRMJ 3490.

### **Graduate Study**

The master of public administration in criminal justice is offered by the Department of Criminal Justice. The MPA curriculum consists of 39 credits including core (7), option-core (2) and criminal justice (4) courses. Core courses are designed to develop comprehensive administrative, managerial, quantitative, financial and analytical skills with an understanding of their applications in different sectors. Criminal Justice courses provide opportunity to supplement the core courses and facilitating the achievement of professional and career objectives in the field. One of the four electives is a required internship in the criminal justice field and can be replaced with an additional elective if the MPA Director approves a waiver. Students may complete the degree within 2 years full-time or approximately 3-4 years part-time.

### **Program Specific Admission Requirements**

***Master of Public Administration Plan B (non-thesis)***

Applicants for the M.P.A. may have any undergraduate major. Only POLS 5000 may be taken prior to full admission into the program with permission of the M.P.A. director.

### **Program Specific Degree Requirements**

***Master of Public Administration Plan B (non-thesis)***

***Required Core Courses***

POLS 5000 Survey of Public Administration  
POLS 5400 Public Personnel Management  
POLS 5410 Administrative Behavior & Theory of Organizations  
POLS 5440 Principles & Processes of Government Budgeting  
POLS 5510 Public Policy and Program Management

POLS 5684 Empirical Analysis for Public Administration  
POLS 5690 Capstone in Public Management

### ***Option-Core Courses***

All MPA students are required to choose 2 courses designated as option core credit, defined as courses relating to more specific focuses on public administration and taught by MPA faculty members.

### ***Criminal Justice Courses***

Students must complete the core and option-core elements of the MPA degree requirements, but may apply CRMJ program coursework as MPA elective requirements, making the degree an MPA with a criminal justice concentration.

All students must take the

following two courses:

CRMJ 5000 Survey of Criminal Justice  
*and*  
CRMJ 5100 Public Policy and Crime

Students must also enroll in three (3) credit hours of CRMJ 5500 Internship in Criminal Justice

Students will select *one* elective course.

These courses are offered on a rotating basis and include the following options: CRMJ 5130 Leadership and Management in the Criminal Justice System; CRMJ 5270 Discrimination and the Law; CRMJ 5150 Crime Causation; CRMJ 5280 Comparative Criminal Justice.

In addition to graduate coursework, M.P.A. students must complete a series of papers constituting the Plan B project. It is the purpose of POLS 5690, Capstone in Public Management, to be a framework within which students initiate and substantially complete their Plan B projects.

Following the completion of all other requirements, the M.P.A. student is required to pass a comprehensive oral examination covering the information contained within his/her program of study as well as a defense of the Plan B projects. The oral examination is also conducted within the framework of the POLS 5690 Capstone course.

Significant administrative experience is required of all M.P.A. graduates. If the M.P.A. student has little or no administrative experience an internship is required and will be included as 3 hours of the required elective credits.



Students entering the M.P.A. Program are expected to possess basic computer literacy, and to have access to a computer for such purposes as communicating with professors via e-mail, receiving M.P.A. Program memos, conducting research on the Web, retrieving articles from course documents libraries, working on course projects, and for conducting interactive/electronic class discussion.

Students must maintain a graduate GPA of 3.0.

Students must complete the CAPP program in lieu of a program of study.

## Criminal Justice (CRMJ)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

**1001 [2120] [ADJU 2120]. Introduction to Criminal Justice. 3.** Introduces the American criminal justice system. Examines nature of crime and describes historical and philosophical foundations of law enforcement agencies, criminal courts and correctional institutions. Discusses major issues facing the criminal justice system.

**1005. Issues in Criminal Justice. 1. [I,L♦(none)]** Introduces students to Criminal Justice through a study of a contemporary issue or problem from the perspectives of the various subfields. *Prerequisite:* criminal justice major.

**2210 [ADJU 2210]. Criminal Law. 3.** Introduces the fundamental principles of substantive criminal law: the history and philosophy of modern criminal law, the basic dimension of criminality, the elements of major crimes, criminal defenses and the nature of criminal sanctions. *Prerequisite:* CRMJ 1001 and completion of a USP V course.

**2400 [ADJU 2400]. Criminology. 3.** Generally introduces the nature of crime, statistics on crime, types of criminal behavior and explanations of crime. Cross listed with SOC 2400. *Prerequisite:* SOC 1000 or equivalent.

**2685 [CRMJ 3680, ADJU 3680]. Research Methods in Criminal Justice. 3.** Introduces students to fundamental issues associated with the application of scientific methods to criminal justice problems. Students examine research designs involving ethnographic, archival, historical, and quantitative methods and how they relate to criminal justice issues. *Prerequisite:* enrollment limited to criminal justice majors.

**3110. Criminal Courts and Processes. 3.** Examines the structure, organization and operation of criminal courts and their role in

the larger criminal justice system; the process of adjudication of criminal cases from initial charging through post-conviction review; the constitutional rights of the accused; and the roles of the major courtroom participants. *Prerequisites:* CRMJ 2210 or declared Public Law minor.

**3200 [ADJU 3200]. Ethics in Administration of Justice. 3.** Introduces basic ethical theories, emphasizing how ethical theory can be applied to contemporary problems in law enforcement, corrections and adjudication. Students will be called upon to apply these various ethical frameworks to typical moral dilemmas in criminal justice. *Prerequisites:* CRMJ 2210, 2400.

**3250 [ADJU 3250]. Juvenile Delinquency. 3.** Considers the nature of delinquency, including an analysis of treatment methods and the juvenile justice system. *Prerequisites:* CRMJ 1001.

**3320. Family Violence. 3.** Prevalence, types and causes of family violence are examined with an emphasis on a sociological understanding. Theories of violence are applied to the conflict that exists within the family institution such as woman battering, courtship conflict and child abuse. *Prerequisite:* 6 hours of sociology or equivalent social science (including SOC 1000).

**3350 [ADJU 3350]. Correctional Theory and Practice. 3.** Examines the various components of the correctional complex from both theoretical and practical frameworks. Students are exposed to the abundance of research that informs current correctional practice and will be called upon to critically evaluate this research and its implications for correctional policy and practice. *Prerequisite:* CRMJ 1001; CRMJ 2685.

**3400 [ADJU 3400]. Deviant Behavior. 3.** Examines theory and research relevant to understanding deviant behavior in general and specific types of individual and subcultural deviancy. Cross listed with SOC 3400. *Prerequisite:* SOC 1000 or equivalent.

**3490 [ADJU 3490]. Issues in Policing. 3.** Examines the various components of policing from both theoretical and practical frameworks. Students are exposed to the abundance of research that informs current policing practice and will be called upon to critically evaluate this research and its implications for policing policy and practice. *Prerequisites:* CRMJ 1001, CRMJ/SOC 2400, CRMJ 2210, and junior standing.

**3500. Drugs and the Criminal Justice System. 3.** Focus on drugs and their impact on society. Particular interest is paid to the extent of drug use/abuse in America, and the effects

of this problem on the criminal justice system and society as a whole. Strategies for controlling both supply and demand are discussed. *Prerequisites:* CRMJ 1001 and CRMJ/SOC 2400.

**4110 [ADJU 4110]. Constitutional Law: Civil Liberties and Rights. 3.** Encompasses case-study analysis of judicial decisions and policies of the constitutional interpretation of the 1st Amendment (freedom of speech, press, association and religion), privacy rights, the rights of the criminally accused, and civil rights (racial and gender equality). Cross listed with POLS 4110. *Prerequisites:* 9 hours of POLS courses, POLS 3100 recommended.

**4130 [ADJU 4130]. Leadership and Management in the Criminal Justice System. 3.** There is a clear need for managers and administrators to understand leadership and ethics. This course is designed to provide students with a foundation in the management and leadership discourse surrounding criminal justice agencies. Dual listed with CRMJ 5130. *Prerequisites:* CRMJ 1001 and 3350 or 3490.

**4140 [ADJU 4140]. Criminal Legal Procedure. 3.** Examines the constitutional principles that safeguard the rights and liberties of criminal suspects and constrain police during the investigatory stages of the criminal justice process: arrest; search and seizure; interrogation; undercover operations; pretrial identification; and the exclusionary rule. *Prerequisites:* CRMJ 1001, 2210, and 2400 or declared Public Law minor.

**4150. Community-Based Corrections 3.** Designed to provide students with an in-depth look at the community corrections complex. It will examine the history and growth of community corrections, the probation system, methods of post-incarceration supervision, intermediate sanctions, and correctional programming and treatment in the community. *Prerequisite:* 9 hours of Criminal Justice (CRMJ 3350 recommended).

**4151 [3150]. Crime Causation. 3.** Examines the causal mechanisms that produce crime. Theoretical perspectives and empirical research from various disciplines will be evaluated, with particular emphasis placed on social factors that may cause crime. Policy implications of the different perspectives will be discussed. Dual listed with CRMJ 5151. *Prerequisite:* CRMJ/SOC 2400.

**4230. Forensic Anthropology. 3.** Introduces methods and purposes of physical anthropology as applied in human identification for law enforcement agencies. Cross listed with ANTH 4230. *Prerequisite:* ANTH 1100.

**4260. Gangs. 3.** Considers the nature and the characteristics of gangs and gang members. The theoretical and empirical evidence regard-

ing the phenomenon of gangs is evaluated. Particular emphasis is placed on the social and policy implications of this social problem. *Prerequisites:* CRMJ/SOC 2400 or CRMJ 3250 and upper division standing in criminal justice.

**4270 [ADJU 4270]. Discrimination and the Law. 3 (Max. 6).** A sociological examination of specific examples of discrimination and justice within the law and the legal system. Topics routinely vary and may include race, gender, religion, cultures or sexuality. Class may be repeated for credit when topics differ. *Prerequisites:* SOC 1000 and junior status.

**4280 [ADJU 4280]. Comparative Criminal Justice. 3. [WC,G♦(none)]** Compares the incidence, trends, control, treatment and prevention of crime across nations using mainstream criminological theories. Examines criminal justice systems from an international perspective and draws lessons for the American society. Explores forms of international cooperation and difficulties in the control of transnational crimes. *Prerequisite:* WA, WB, CRMJ 1001, junior standing.

**4350 [ADJU 4250]. Sociology of Law. 3.** A consideration of sociological concepts such as inequality, stratification, social control and social change in an analysis of the law and legal institutions. Topics include: the role of the police, lawyers, judges, and juries; race, sex, age, and sexuality discrimination and civil rights; free speech, and toxic torts. Cross listed with SOC 4350. *Prerequisites:* SOC 1000 and upper division status. (Offered based on sufficient demand and resources)

**4370 [ADJU 4370]. Criminal Psychopathology. 3.** Provides an overview of current theories and empirical evidence concerning relationship between psychological disorder and criminal behavior. Examines various clinical syndromes and their role in biological, social and psychological genesis of crime, as well as the concept of criminal responsibility. Cross listed with PSYC 4370. *Prerequisite:* 6 hours in psychology.

**4540. Women, Crime and the Law. 3.** Addresses status of women as offenders and as victims in society and in the criminal justice system. Considers special role of women as professionals in the criminal justice system. Cross listed with WMST 4540. *Prerequisite:* WMST/SOC 1080, 3500 or SOC 2400.

**4600 [ADJU 4600]. Political Violence. 3.** Examines causes and consequences of violence both among individuals and among nations. Cross listed with POLS 4600. *Prerequisites:* POLS 1000 or SOC 1000. (Normally offered every other year)

**4700. Global Terrorism. 3.** Examines the concept, causes, incidence, types, consequences of, and responses to terrorism. Highlights the distinction between domestic and international terrorism and expands on the latter within the framework of the global environment. *Prerequisites:* CRMJ 1001 and CRMJ 2400 and CRMJ 2210; or POLS 2310.

**4710 [ADJU 4710]. Police Deviance. 3.** A general description of police officials' activities which are inconsistent with the officers' official authority, organizational authority, values, and standards of ethical conduct (which are usually implied, rather than stated). Deviance can encompass a plethora of behaviors for which an officer can be disciplined. *Prerequisites:* POLS 1000 and CRMJ 1001.

**4730. Psychology and Law. 3.** Exposes students to the application of psychological principles to problems in law. Emphasizes the American trial system, correction systems and civil commitment. Cross listed with PSYC 4730. *Prerequisite:* 12 hours in psychology.

**4750 [ADJU 4750]. Internship in Criminal Justice. 1-12 (Max. 12).** Integrates practical criminal justice experience with academic knowledge. Students participate in specifically assigned duties and observe broader activities of the sponsoring organization, and reflect upon these experiences through written assignments. *Prerequisite:* junior standing, 2.5 cumulative GPA, completion of at least 6 upper division hours in CRMJ and consent of instructor.

**4760. Child Maltreatment. 3.** Lecture and seminar. Examines the phenomenon of child abuse and neglect. Includes an overview of attitudes towards and legal definitions of child maltreatment. Explores parental factors, contextual influences and developmental consequences of maltreatment. Relies heavily on current research in child abuse and neglect. Emphasizes policy implications. Cross listed with PSYC 4760. *Prerequisite:* 6 hours in psychology. (Offered alternate years)

**4860. Social Inequality, Crime, Criminal Justice and the Law. 3.** Provides an in-depth look at social inequality and its impact on crime, criminal justice, and the law. Particular emphasis will be given to the individual and interactive effects of race, class, and gender inequality. Critical theoretical perspectives that promote social justice will be the primary analytical focus. *Prerequisite:* 9 hours of CRMJ related coursework.

**4890. Serial Killers. 3.** Introduces students to particular case studies of notorious serial killers and explores current methods of tracking and apprehending such individuals. Draws on

readings, films, and lectures. *Prerequisites:* junior standing and 6 completed hours of upper division criminal justice courses.

**4965. Research Hours in Criminal Justice. 1-6 (Max. 6).** Provides undergraduates with an opportunity to assist in conducting various aspects of research under the supervision of criminal justice faculty. Specific research activities and requirements will be determined in consultation with the sponsoring faculty person. Credit is only available for research corresponding to enrollment in this course. Dual listed with CRMJ 5965. *Prerequisites:* upper division standing and consent of instructor required in advance.

**4970 [ADJU 4970]. Criminal Justice Practicum. 9-12 (Max. 12).** Integrates academic knowledge with applied administration of justice experience through supervised field placement. Students are required to complete reading, discussion and writing assignments in addition to their practicum responsibilities. *Prerequisites:* junior standing and consent of practicum coordinator.

**4975 [ADJU 4975]. Readings. 1-3 (Max. 6).** Special programs of readings in criminal justice related subjects will be outlined to meet needs of individual students. *Prerequisite:* consent of instructor.

**4990 [ADJU 4990]. Topics. \_\_\_\_ 1-3 (Max. 6).** Intended to accommodate various special subjects not offered as regular courses. *Prerequisites:* as listed for housing department's topics course.

**5000. Survey of Criminal Justice. 3.** Provides an overview of criminal justice theory by providing critical evaluation and discussion of research in the criminal justice field. It will emphasize seminal works and review current research concerning the structure, function, operation, interaction of the criminal justice system's primary components, and future trends. *Prerequisite:* Admission to the MPA Program.

**5100. Public Policy and Crime. 3.** This course is designed to take a multidimensional look at public policy issues related to the prevention and control of crime in the United States. Issues covered include the development, implementation, and evaluation of crime control policy. *Prerequisite:* Admission to the MPA Program.

**5130. Leadership and Management in the Criminal Justice System. 3.** There is a clear need for managers and administrators to understand leadership and ethics. This course is designed to provide students with a foundation in the management and leadership discourse

surrounding criminal justice agencies. Dual listed with CRMJ 4130. *Prerequisites:* graduate standing or consent of instructor.

**5151. Crime Causation. 3.** Examines the causal mechanisms that produce crime. Theoretical perspectives and empirical research from various disciplines will be evaluated, with particular emphasis placed on social factors that may cause crime. Policy implications of the different perspectives will be discussed. Dual listed with CRMJ 4151. *Prerequisite:* graduate standing.

**5500. Internship in Criminal Justice. 3.** Educationally-oriented assignments for work in selected criminal justice agencies, with tutorial types of supervision. Offered Satisfactory/Unsatisfactory only. *Prerequisite:* Admission to the MPA Program.

**5965. Research Hours in Criminal Justice. 1-6 (Max. 6).** Provides students with an opportunity to assist in conducting various aspects of research under the supervision of criminal justice faculty. Specific research activities and requirements will be determined in consultation with the sponsoring faculty person. Credit is only available for research corresponding to enrollment in this course. Dual listed with CRMJ 4965. *Prerequisites:* upper division standing and consent of instructor required in advance.

## English

201 Hoyt Hall, 766-6452

FAX: (307) 766-3189

Web site: [www.uwyo.edu/english](http://www.uwyo.edu/english)

Department Chair: Peter Parolin

### Professors:

**SUSAN ARONSTEIN**, B.A. Seattle Pacific University 1980; M.Sc. Edinburgh University 1984; Ph.D. Stanford University 1987; Professor of English 2006, 1987.

**SUSAN C. FRYE**, B.S. Smith College 1974; M.A. University of New Mexico 1981; Ph.D. Stanford University 1986; Professor of English 2001, 1986.

**ALYSON HAGY**, B.A. Williams College 1982; M.F.A. University of Michigan 1985; Professor of English 2008, 1996.

**CAROLINE McCracken-Flesher**, M.A. University of Edinburgh 1980; M.A. Brown University 1986; Ph.D. 1989; Professor of English 2004, 1989.

**DAVID ROMTVEDT**, B.A. Reed College 1972; M.F.A. University of Iowa 1975; Professor of English 2008, 1995.

### Associate Professors:

**CAROLYN ANDERSON**, B.A. Auckland University 1981; M.A. 1984; Ph.D. Stanford University 1992; Associate Professor of English 2001, 1993.

**JEANNE E. HOLLAND**, B.A. Auburn University 1978; M.A. 1981; Ph.D. State University of New York, Buffalo 1989; Associate Professor of English 1995, 1989.

**KELLY KINNEY**, B.A. Purdue University 1992; M.A. University of Nebraska-Omaha 1996; Ph.D. Ohio University 2005; Associate Professor of English and Director of Writing Programs 2015.

**MICHAEL KNIEVEL**, B.A. Creighton University 1995; M.A. 1997; Ph.D. Texas Tech University 2002; Associate Professor of English 2009, 2002.

**CLIFFORD J. MARKS**, A.B. University of Michigan 1983; M.A. State University of New York, Buffalo 1988; Ph.D. 1992; Associate Professor of English 2000, 1993.

**KATE NORTHROP**, B.A. University of Pennsylvania 1991; M.F.A. University of Iowa 1995; Associate Professor of English 2009, 2008.

**ERIC W. NYE**, B.A. St. Olaf College 1974; M.A. University of Chicago 1976; Ph.D. 1983; Associate Professor of English 1989, 1983.

**PETER PAROLIN**, B.A. University of British Columbia 1988; M.A. University of Pennsylvania 1991; Ph.D. 1997; Associate Professor of English 2003, 1997.

**CHRISTOPHER CASKEY RUSSELL**, B.A. Western Washington University 1993; M.A. 1996; Ph.D. University of Oregon 2001; Associate Professor of English 2009, 2004.

**BRAD WATSON**, B.A. Mississippi State University 1978; MFA University of Alabama 1985. Associate Professor of English 2009, 2005.

### Assistant Professors:

**JASON BASKIN**, A.B. Harvard University 2000; M.A. Princeton University 2006; Ph.D. 2008; Assistant Professor of English 2010.

**MICHAEL EDSON**, B.A. Virginia Tech University 2003; M.A. University of Delaware 2005; Ph.D. 2011; Assistant Professor of English 2014.

**ANDREW FITCH**, B.A. University of Wisconsin, Madison 1997; Ph.D. Graduate Center of the City University of New York 2009; Assistant Professor of English 2009.

**ERIN FORBES**, B.A. Reed College 2002; M.A. Princeton University 2005; Ph.D. Princeton University 2009; Assistant Professor of English 2009.

**SCOTT HENKEL**, B.A. Western Michigan University 1997; M.A. Ohio University 2000; Ph.D. Michigan State University 2007; Assistant Professor of English 2015.

**JULIA OBERT**, B.A. University of Western Ontario 2004; M.A. University of British Columbia 2006; Ph.D. University of California, Irvine 2011; Assistant Professor of English 2011.

**DANIELLE PAFUNDA**, B.A. Bard College 1999; M.F.A. New School University 2002; Ph.D. University of Georgia 2008. Assistant Professor of English 2008.

**JASON THOMPSON**, B.A. Pacific Lutheran University 1996; MFA University of Arizona 2000; Ph.D. 2008; Assistant Professor of English 2008.

**ARIELLE ZIBRAK**, B.A. University of Rochester 2003; M.A. Boston University 2007; Ph.D. 2013; Assistant Professor of English 2014.

### Associate Lecturer:

**PAUL BERGSTRAESSER**, B.A. Oberlin College 1989; M.A. Northern Michigan University 2000; Ph.D. University of Illinois, Chicago 2007; Associate Lecturer in English 2013, 2007.

**APRIL HEANEY**, B.A. University of Wyoming 1998; M.A. 2000. Associate Lecturer in English 2009, 2005.

**VAL PEXTON**, B.A. Humboldt State University 1986; B.A. University of Wyoming 1998; M.A. 2001; M.F.A. 2008; Associate Lecturer in English 2013, 2009.

**JOYCE STEWART**, B.A. Felician College 1994; M.A. Creighton University 1998; Associate Lecturer in English 2013, 2008.

**MARGARET VAN BAALEN-WOOD**, B.A. University of Wyoming 1983; M.A. 2003. Associate Lecturer in English 2009, 2004.

### Assistant Lecturers:

**RICK FISHER**, B.A. University of Wyoming 2002; M.A. 2006; Assistant Lecturer of English 2011.

**JASON KIRKMEYER**, B.A. University of Wyoming 2002; M.A. 2004; Assistant Lecturer of English 2011.

Study in the English department today embraces literature, creative and expository writing, and the nature and workings of language. Students in the department's programs can learn to read with pleasure and understanding, to write with grace, clarity and force, and to think with greater penetration and breadth. With these accomplishments, students are prepared for lives and work in which their power to understand, read, write and communicate will serve themselves and

others, some specifically in careers in writing or teaching, some in professions of law, medicine, administration or almost any other field.

English studies center on the reading of what people have said, sung or written about their lives, their desires and the whole experience of being human. Literature is a great inheritance, a tradition that reaches back through the centuries, but it is also continually growing and changing. New theories about literature, and new and rediscovered literature itself, renew the ancient functions of literature to reflect, support and enhance the lives of the men and women who read it.

### Assessment of English Undergraduate Learning

Through an active and ongoing assessment of our program, we have identified the following outcomes that are expected of each student graduating with a Bachelor of Arts in English. We will continue to assess our curriculum to ensure these outcomes are being met:

UW students graduating with a Bachelor of Arts in English will have demonstrated an ability to:

1. Read, interpret, and write about a diverse range of texts in English, for example literature, film, digital media, and popular culture;
2. Understand those texts analytically and critically;
3. Understand those texts on the basis of careful close reading;
4. Understand those texts through past and current literary theory;
5. Understand that those texts are culturally constructed in time, place, and tradition;
6. Understand how those texts inform culture;
7. Participate in the critical and cultural discourses of English;
8. Participate clearly and appropriately through multiple spoken and written forms

### Undergraduate Major

Requirements	Hrs.
Lower-division surveys of literature in English 2425, 2430, 2435 .....	9
Shakespeare or Renaissance Literature 4110, 4120, or 4170.....	3

4000-level courses in literature before 1900, in two different periods—4140, 4160, 4180, 4190, 4200, 4210, 4220, 4240, 4250, 4260, 4310, 4320, 4360, 4830 (exclusive of the Shakespeare/Renaissance requirement) .....	6
Emerging fields and approaches .....	3
3610, 3710, 4450, 4460, 4470, 4640, 5360, or 5870	
Senior Seminar (4990).....	3
Electives (at least 6 hours must be at the 4000-level) .....	12
<b>Total hours</b>	<b>36</b>

*(Courses in creative writing and professional writing may count as electives toward the major.)*

**Concentration in Literary Studies:** Students wishing to concentrate in literary studies, including students interested in pursuing graduate degrees in English, should attempt to take the following upper-division courses: a course in Chaucer or in Medieval literature; a Shakespeare course; another course in English literature before 1800 (exclusive of Chaucer and Shakespeare); a course in 19<sup>th</sup>-Century English literature; two courses in American literature; a course in literature after 1900; the Senior Seminar; a course in Emerging fields and approaches.

In addition, in order to introduce its majors to language, culture, and comparative literature, the English department requires three semesters of a single foreign language. The choice of language should be made in consultation with the student’s adviser and in consideration of career plans. For instance, students planning graduate study in literature may wish to choose a relevant modern or classical language. Or, a student in disability studies may substitute American Sign Language or Braille with permission of the assistant chair.

Within the framework above, each student should construct, with the help and approval of the adviser, a balanced and coherent program.

Only those courses in which a grade of C or better has been earned may count toward the 36 hours required for the B.A. (the B.S. is not offered) and the foreign language requirement. No 1000 courses count toward the B.A.

### Advanced Standing

Advanced standing in English is required for all majors prior to taking the senior seminar (ENGL 4990). To be eligible for advanced standing in English, the student must have completed 24 hours of English course work

above Writing A, including the 3 required survey courses (2425, 2430, 2435). Each course must have been passed with a grade of C or better. Approved transfer courses from other institutions will satisfy the prerequisites for advanced standing. English 4990 should be taken in the next-to-the-last semester before graduation.

### English Honors Program

Requires a 3.5 GPA and a senior honors paper and defense. See the English department for information.

### Minor in Literary Studies

To minor in literary studies, a student must complete the following sequence of courses:

Requirements	Hrs.
2000/3000-level surveys .....	9
(2425, 2430, 2435, 3150, 3180, or 3380)	
4000-level literature courses .....	9

Alternatively, a student, in close consultation with an English department adviser, may construct his or her own program. Only those courses in which a grade of C or better has been earned may count toward the Literary Studies minor. For more information, please come to the English Department office, 201 Hoyt Hall.

### Minors in Writing

The writing minors are designed to be used with any major. English majors may choose to have a minor in creative or professional writing, but at least 12 credit hours in the minor must be from courses not counted toward the student’s major. All courses counted toward the writing minors must be completed with grades of C or better. Students in either minor must consult with an adviser from the minor in designing their programs.

**Minor in Creative Writing.** The creative writing minor consists of six courses (18 hours) in creative writing and literature. Four of these courses will be in creative writing (12 hours) and must adhere to the following sequence: ENGL 1040 Intro to Creative Writing, **two** Lower Division Creative Writing courses (at the 2000-level), and an Upper Division course (4050). In addition, two courses will be in literature (6 hours), one of which must be at the 3000- or 4000-level. All courses must be completed with grades of C or better.

This minor is designed to be used with any major and must be designed in conjunction with a creative writing adviser. English majors may choose to have a minor in creative writing, but “at least 12 credit hours in a minor must be from courses not counted toward the student’s major” (UW *University Catalog*). Each course must be passed with a grade of C or better.

**Minor in Professional Writing.** This minor is designed for students in any major who are considering careers in professional or technical writing (including teaching, publishing or editing, web authoring, public relations, and journalism) as well as for students who simply seek writing expertise beyond the General Education requirements. The minor will offer in-depth instruction in writing that will prepare them for the numerous careers in which effective written communication is highly valued.

To complete the 18 credits required for the minor, students take the foundations courses (ENGL 2005 or ENGL 2035 AND ENGL 4000), at least two upper-division professional writing courses (ENGL 4010, 4020, 4025, 4030, 4050, 4075, and/or 4970), and up to two additional elective courses approved by their adviser (0-6 credits).

## Teacher Certification

Students seeking the B.A. in English may also be certified for public school teaching by completing additional requirements set forth by the College of Education, via a concurrent major in English and English Education.

## Prerequisites

Most 2000-level courses require the completion of the WA requirement. Normally, 3000-4000-level courses have the prerequisites of 6 hours of 2000-level literature courses. Students without certain prerequisites should consult the English Department for permission to enroll.

## Graduate Study

The M.A. graduate program in English offers two concentrations leading to the master of arts degree: Literary Studies, and Composition and Rhetoric. The department also offers an M.F.A. in creative writing: a 40-hour studio degree in poetry, fiction, or creative non-fiction.

## Program Specific Admission Requirements

### *Master of Arts in English*

In addition to the minimum requirements set forth in this *Catalog*, the Department of English requires that students demonstrate by means of an official transcript that they have a solid undergraduate record with course work in English. That said, the department welcomes degrees in English or other disciplines from four-year colleges or universities.

Depending on their undergraduate preparation, some successful applicants may be required to take additional or specific courses toward the English master’s degree.

Students must show knowledge of one foreign language, ordinarily ancient or modern European. Students may complete a language requirement concurrently with their program.

Candidates must submit GRE general test scores, a writing sample, and a 500-word statement of purpose.

Students should consult the M.A. web site or contact the department for specific admission information and deadlines.

### *Master of Fine Arts in Creative Writing*

In addition to the minimum requirements set forth in this *Catalog*, the Creative Writing M.F.A. Program requires that students demonstrate by means of an official transcript that they have a solid undergraduate record. The M.F.A. program welcomes degrees in any discipline from four-year colleges or universities. Candidates must submit GRE general test scores, three letters of recommendation, a writing sample consisting of no more than 25 pages of prose or 10 pages of poetry, and a 500-word statement of purpose. Students should consult the M.F.A. web site or contact the department for specific admission information and deadlines.

## Program Specific Graduate Assistantships

Teaching assistantships are available to qualified applicants. Full assistantships carry an annual stipend and a remission of full-time tuition and fees, and require the teaching of freshman English - currently one section per term. (Sections meet three hours each week and are composed of a maximum of 23 students.)

Each fall the department conducts a week-long orientation for new teaching assistants and a subsequent series of colloquia for all graduate assistants. Each assistant is assigned

an experienced teacher in the department as a mentor, to be available throughout the semester for consultation on teaching and grading techniques.

## Program Specific Degree Requirements

### *Master of Arts in English Plan A (thesis)*

The Department of English offers two concentrations within the master of arts degree. A concentration consists of three courses chosen from among those designated by the department as belonging to that concentration, together with other courses to total 26 hours. The concentration insures coherence in each student’s graduate program; breadth is insured by a distribution of courses. Much of each student’s program is taken in courses outside the concentration. Seminars will usually include students from all concentrations.

**Literary Studies.** Working from a variety of perspectives, this concentration focuses on the study of literature and of other culturally significant texts and materials, including, for example, film, oral materials, and political documents.

**Rhetoric and Composition.** Founded in the reflective practice of different kinds of writing, this concentration emphasizes the theory, research, and scholarship bearing on the production of discourse; it offers training for writing and for teaching that can include teaching of ESL, composition, and creative writing.

26 hours of coursework and a thesis for 4 additional hours (ENGL 5960).

A 1 credit course in bibliography and research methods.

A course in contemporary theory.

Courses in at least three different periods, genres, major figures, or approaches.

A reading exam and final oral examination covering coursework as well as the thesis.

With approval of the graduate adviser, a student may take a maximum of 3 hours credit outside the department.

Students take most of their courses at the 5000 level; a student may take no more than two 4000-level courses toward the M.A. degree.

### *Master of Fine Arts in Creative Writing Plan A (thesis)*

The Creative Writing M.F.A. Program offers three areas of concentration: poetry, fiction, and creative non-fiction. A concentration consists of three workshops,

a minimum of 10-12 semester hours, in the appropriate area. (An additional workshop outside the student's main genre is also required.)

M.F.A. students follow the guidelines for Plan A. The M.F.A. degree requires 34-36 hours of courses and a thesis for 6 additional hours of thesis research as ENGL 5960 for a total of 40-42 hours.

Only those courses in which a B or better has been earned may be applied to the graduate program of study.

All courses must be taken for a grade unless offered for S/U only. No graduate credit is allowed for grades S and U.

The cumulative GPA must be at least 3.0 to receive a degree. Courses below 4000 will not count toward the degree nor will they be figured in the GPA, although they will appear on the transcript.

Four workshops, normally 4 credit hours each, 14-16 hours (one workshop must be outside the student's main genre).

Two courses in Literary Studies, 4000 or 5000 level, 6 to 8 hours min.

3 elective courses, 9 hours min.

Thesis, at least 6 hours (may be taken incrementally).

Professional internship, 3 hours.

## English (ENGL)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**1008. Introduction to Academic Writing. 3.** Prepares students for English 1010, the required first-year writing course. Emphasizes aspects of writing essential to effective communication, including paragraph and essay organization, the use of support and detail, sentence and clause structure, diction and mechanics. Offered for S/U only.

**1009. IC In Pop Culture. 1.** Complements WA writing activities, provides opportunities for students to do thematic readings, expand their understanding of diversity issues, learn about the intellectual expectations of college life, and become acquainted with the rich resources of the UW campus. Linked with WA course. *Prerequisite:* concurrent enrollment in ENGL 1010.

**1010. College Composition and Rhetoric 3. [WA♦COM1]** A composition course emphasizing expository writing and close, analytical reading. A grade of C or better is required to meet the WA requirement. Students may not have credit in both ENGL 1010 and UWYO 1000, 1110 or 1210.

**1030. Intellectual Community in Cinema Etc. 3. [I♦(none)]** Introduces students to a range of issues within the humanities through the analysis of film, television, and theater. Taught respectively by Modern and Classical Languages and English. Cross listed with LANG 1030.

**1040. Intellectual Community: Introduction to Creative Writing. 3. [I♦(none)]** Focus on critical learning skills as they relate to creative writing. Read from a variety of genres, attend literary events on campus, acquire research skills, and produce creative writing. Will produce portfolios of creative work in these areas, along with a self-reflective essay applying the critical skills learned throughout the semester.

**1050. Literature and Film from 1940 to the Present. 3.** A study of contemporary texts and films from various cultures, introducing the variety and vigor of recent world literature. Does not count toward the English major.

**1080. Introduction to Women's Studies. 3. [CH,D♦(none)]** An introduction to key issues in women's studies. A topical examination of women's participation in and relationship to institutions of society, such as family and school, as well as processes and activities, such as work, art and politics in historical and cross-cultural analysis. Cross listed with WMST 1080.

**1100. FIG in: Special Topics. 3. [I,L♦(none)]** Anchor course for Freshman Interest Groups (FIG) which each fall presents a FIG-related Topic focus. *Prerequisite:* enrollment in designated FIG section.

**1101. First-Year Seminar. 3. [(none)♦FYS]**  
**2005. Writing in Technology and the Sciences. 3. [WB♦COM2]** Develops writing styles and techniques, document design and formats, and audience/readership considerations that are specifically suited to technological and scientific fields of study. The course concludes with a student-directed long form report. *Prerequisite:* successful completion of WA.

**2020. Introduction to Literature. 3. [CH,WB♦COM2]** An introduction to literary study including poetry, fiction and drama. *Prerequisites:* WA; sophomore standing.

**2030. Critical Reading and Writing. 3. [WB♦(none)]** Provides practice and guidance in writing expository essays. *Prerequisites:* WA; sophomore standing.

**2035. Writing for Public Forums. 3. [WB♦COM2]** Introduction to professional writing that focuses on analyzing and producing texts designed to influence public opinion. Genres may include letters, editorials, web pages, pamphlets, e-mail, speeches and posi-

tion papers. Focuses on skills in collaboration and use of technology necessary for ethical, effective participation in public discourse. *Prerequisite:* WA.

**2050. Creative Writing-Introduction to Fiction\_\_\_\_\_ 3 (Max. 6).** Analyzes forms of fiction and the practice of creative writing at an introductory level. *Prerequisite:* WA.

**2060. Creative Writing-Introduction to Nonfiction\_\_\_\_\_ 3 (Max. 6).** The new nonfiction course will be described according to the emphasis the individual professor chooses to impart. In general, the course will teach students to research, organize, and express themselves in a nonfiction genre, such as essay, memoir, article, biography, autobiography, etc. *Prerequisite:* WA.

**2070. Creative Autobiographical Writing. 3.** Students read and explore in writing five autobiographical forms: brief bio for publicity and job application purposes, memoir, personal essay, confession and fictional monologue. What you can reveal about yourself, when and how and for whom. *Prerequisite:* completion of WA.

**2080. Creative Writing-Introduction to Poetry\_\_\_\_\_ 3 (Max 6).** Analyzes forms of poetry and practice of creative writing at introductory level. *Prerequisite:* WA.

**2125. Writing in Popular Genres. 2. [WB♦(none)]** Analyze and write in a variety of popular fiction and non-fiction genres. Study publishers' descriptions and read examples and critical analysis of the genres. Finally, produce a rhetorical description and an original text work in one chosen genre. *Prerequisite:* ENGL 1010.

**2130. Creative Impulse: Literature and the Fine Arts. 3.** Centers on literature with analogous examples drawn from painting, sculpture, architecture and music. Focuses on the variety of ways in which people perceive, evaluate and interpret reality.

**2170. The Bible as Literature. 3.** A study of the Bible as a body of literary expression with an introduction to critical technique appropriate to such study. *Prerequisite:* WA.

**2190. African Literature. 3.** A study of the modern literature of Africa written in English, against its background of the continent's oral traditions. *Prerequisite:* WA.

**2240. Arthurian Legend. 3.** An introduction to both Arthurian romance and writing about literature. Traces the Arthurian Legend from its roots in Welsh mythology through its development in the Middle Ages and to its current manifestations in popular culture. *Prerequisites:* WA; sophomore standing.

**2340. Native American Culture and Literature. 3. [CH,D◀(none)]** Broad cultural study of Native Americans, past and present. Emphasizes folklore and literature. Cross listed with AIST 2340. *Prerequisite:* WA.

**2345. American Indians in Hollywood Film. 3. [CH◀(none)]** Examines the ways Hollywood film has constructed various forms of racial identity for American Indians. Cross listed with AIST 2345. *Prerequisite:* WA.

**2350. African American Literature. 3. [WB,D◀(none)]** Encompasses poetry, fiction, drama and autobiography from the Harlem Renaissance and earlier to present. Cross listed with AAST 2350. *Prerequisite:* WA.

**2360. Mexican American Literature. 3. [CH,D◀(none)]** Discusses literary reflections of Chicanoism. Studies literature of the Hispanic Southwest, Mexican-American folklore and the contemporary Chicano movement. Cross listed with CHST 2360. *Prerequisite:* WA.

**2400. Introduction to Folklore. 3.** An introduction to forms of folklore and their relation to cultural settings. Focuses on myths, folktales, legends, ballads, proverbs, riddles, etc. from various cultures. *Prerequisite:* WA.

**2410. Literary Genres. 3 (Max. 6).** [CH,WB◀H] Studies specific genres of literature. Emphasis will vary (poetry, fiction, drama, etc.) from semester to semester, depending on curricular needs. *Prerequisite:* WA.

**2425. Literatures in English I. 3. [CH◀(none)]** Surveys major figures and literary movements in literatures written in English through 1750. *Prerequisite:* WA.

**2430. Literatures in English II. 3. [CH◀(none)]** Surveys major figures and literary movements in literatures written in English 1750-1865. *Prerequisite:* WA.

**2435. Literatures in English III. 3. [CH◀(none)]** Surveys major figures and literary movements in literatures written in English 1865-present. *Prerequisite:* WA.

**2490. Studies in \_\_\_\_\_. 1-6 (Max. 6).** Presents a variety of topics in literature. *Prerequisite:* WA.

**3100. Tribal Literatures of the Great Plains. 3. [WC,D◀(none)]** Familiarizes students with American Indian literatures of the Great Plains. The Great Plains region is the locus of much historical and contemporary significance in regard to American Indian cultures. The literature of Great Plains Indians allows students to confront and reexamine the national narratives surrounding American Indians. Cross listed with AIST 3100. *Prerequisite:* 6 hours of AIST or ENGL.

**3150. World Literature. 3 (Max. 6).** [CH,G◀(none)] Encompasses reading and analysis of major works representative of significant periods or literary forms in the history of literature. *Prerequisites:* WA and WB.

**3180. Medieval Culture. 3.** Surveys the major texts of medieval European literature (in translation) in their cultural and historical contexts. Genres covered include epic, saga, romance, dream vision, drama and fabliaux. *Prerequisite:* WA.

**3340. Philosophy in Literature. 3 (Max 6).** Examines central themes in literary works with philosophical significance; studies related general issues. Authors studied may include Aristotle, Dostoevski, Kafka, ee cummings, Grass, Mann, Pound, Rilke, Camus, and Sartre. Issues include questions of interpretation, criticism, and translation, as well as the possibility of direct philosophical influence on authors. Cross listed with PHIL 3340. *Prerequisites:* one course in philosophy and one course in literature or criticism in the English department.

**3380. Great Works of American Literature. 3.** Traces the development and staying power of the American tradition by studying literary monuments such as Melville, Whitman, Dickinson, Eliot, and Faulkner. Credit cannot be earned in both 2380 and 3380. *Prerequisite:* WA.

**3610. Non-Western Women Writers. 3.** Examines literature written by women in non-western cultures. The geographical region, time period, and genres of literature may vary by semester. Analyzes representations of such topics as family, marriage, sexuality, community, and colonialism as expressed in fiction, drama, literary non-fiction, and/or poetry. *Prerequisites:* ENGL 1010 or WMST 1080; junior standing.

**3710. Gender: Humanities Focus. 3. [CH◀COM2]** Explores how men and women are imaged differently, studying the influence of representation on gender (including representations in literature, film, art, popular culture, and/or performance). Sharpens students' ability to analyze texts and images and investigate those texts' messages about gender, sexuality, ethnicity and class. Cross listed with ART/WMST 3710. *Prerequisite:* WMST 1080 or ENGL 1010.

**4000 [3000]. 21<sup>st</sup> Century Issues in Professional Writing. 3. [WC◀(none)]** Examines ethical, cultural, and practical issues for writers in complex, real-world scenarios that pose communication challenges. Focuses on applying fundamental principles of rhetoric, effective research methods, analytical skills, and design technologies to collaborative and individual problem-based projects. *Prerequisites:* WA and WB.

**4010. Technical Writing in the Professions. 3. [WC◀COM3]** Deals with professional writing for various audiences. Includes research methods, audience analysis, organization and developmental techniques, abstracting, types of reports and popularization. Part of the last half of the course is devoted to solution of a student-initiated problem, culminating in the writing of a long-form report. *Prerequisites:* WA and WB; junior standing.

**4020. Editing for Publication. 3.** Theory and practice of editing in the contexts of book, magazine, newspaper, and web-based publications. Standard editing practices for using grammar, proofreading marks, and computer editing tools. *Prerequisites:* WA, WB (ENGL 2035 and 3000 recommended).

**4025 [3050]. Writing for the Web. 3. [WC,L◀COM3]** Covers a variety of issues relevant for composing in the 21st century. As students learn to design and generate effective writing for a particular audience in a digital environment, they will also develop skills with advanced web and print research, basic HTML programming language, and standard web design software. *Prerequisites:* WB and junior standing.

**4050. Writer's Workshop in \_\_\_\_\_. 1-3 (Max. 6 at undergraduate level, Max. 12 for B.A. plus M.A.).** Students submit manuscripts in the short story, poetry, drama, etc. Includes class and conference criticism and consultation. Considers different types of creative writing in various semesters, as announced in class schedule. *Prerequisites:* 3 hours of a 2000-level creative writing class in the appropriate genre and consent of instructor.

**4061. Rhetorical Theory and Criticism. 3.** An investigation into how rhetorical theory, spanning from its ancient roots in Aristotelian thinking to its current postmodern components, operates in society. Explores how various critical methods can be utilized to gain a stronger understanding of public communication texts, including newspapers, speeches, music and film. Cross listed with COJO 4061; dual listed with ENGL 5061. *Prerequisites:* COJO 1040 and 3040 or ENGL 2035.

**4070. Film Directors: \_\_\_\_ 3 (Max. 6).** Offers an intensive examination of representative films by selected film makers. *Prerequisite:* 6 hours of 2000-level literature courses.

**4075. Writing for Non-Profits. 3. [WC◀COM3]** Designed for students interested in working in the non-profit sector. Explores rhetorical, political and social dimensions of writing and communicating in the non-profit world and features intensive study of special topics and problems related to non-profit communication, including activ-

ism, grant writing, organizational rhetoric, and non-profit genres. Content varies. *Prerequisite:* WB.

**4080. Film Genre Studies: \_\_\_\_\_ 3 (Max. 6).**

Offers structural, film historical and political analyses of selected major film genres. *Prerequisite:* 6 hours of 2000-level literature courses.

**4090. Film and Religion. 3.** Movies use religion to convey messages; they debate religious issues and use religion to debate non-religious issues. This course analyzes how film makers use religion and religious themes to transform religions into advocates for social issues and to shape religion's role in society. Popular films drawn from many genres. *Prerequisite:* 6 hours of 2000-level or higher literature courses or religion courses.

**4110. Shakespeare: Romantic Comedies and History Plays. 1.5-4 (Max. 4).** *Prerequisite:* 6 hours of 2000-level literature courses.

**4120. Shakespeare: Tragedies and Romances. 1.5-4 (Max. 4).** *Prerequisite:* 6 hours of 2000-level literature courses.

**4140. English Drama: Restoration and 18th Century. 3.** A study of the development of the drama from 1660 to 1800, including comedy of manners, heroic drama, tragedy, sentimental comedy, laughing comedy, satire, ballad opera and burlesque. *Prerequisite:* 6 hours of 2000-level literature courses.

**4150. Modern Drama. 3.** Focuses on development and shape of modern theatre. Plays are treated as dramatic literature, performed art and manifestations of a social and philosophical milieu. *Prerequisite:* 6 hours of 2000-level literature courses.

**4160. Chaucer. 3.** A study of the major works. *Prerequisite:* 6 hours of 2000-level literature courses. (Alternates with ENGL 4180).

**4170. Early English Renaissance Literature: 16th Century. 3.** A study of prose, poetry and drama from More through Shakespeare. Also studies developments in primary genres, styles, aesthetic values and intellectual concerns of the period's literature. *Prerequisite:* 6 hours of 2000-level literature courses.

**4180. Middle English Literature. 3.** Surveys the literature of medieval England from the early 13th century to the mid-15th century. Focuses on language, literature and cultural history. *Prerequisite:* 6 hours of 2000-level literature courses. (Alternates with ENGL 4160).

**4190. Milton. 3.** The complete poetry and selected prose of John Milton, with emphasis on the art and meaning of *Paradise Lost*. *Prerequisite:* 6 hours of 2000-level literature courses.

**4200. Later English Renaissance Literature: 17th Century. 3.** A study of prose, poetry and drama from Bacon and Donne through Browne and Behn. Also studies developments

in the primary genres, styles, aesthetic values and intellectual concerns of the literature of the period. *Prerequisite:* 6 hours of 2000-level literature courses.

**4210. English Literature of the 18th Century: Restoration to Mid-Century. 3.** A survey of poetry, satire, comedy of manners and the early novel, as well as literary, cultural, historical and philosophical works from the age of Dryden through the age of Swift and Pope. *Prerequisite:* 6 hours of 2000-level literature courses.

**4220. English Literature of the 18th Century: Mid- to Late- Century. 3.** A study of poetry, the novel, development of literary criticism, historical and cultural commentary, and biography from the age of Johnson and Boswell to the beginnings of romanticism. *Prerequisite:* 6 hours of 2000-level literature courses.

**4230. Greek Tragedy. 3.** Reading and discussion of major plays by Aeschylus, Sophocles, and Euripides, together with examination of the performance and social context of Greek drama, its use of traditional myths, and selected issues in contemporary scholarship on the tragedies. Cross listed with CLAS/THEA 4230. *Prerequisite:* 3 hours of classics courses. (Offered in spring in alternate years)

**4240. English Literature of the 19th Century: Romantic Period. 3.** A study of prose and poetry of authors who flourished between 1789-1832, such as Blake, Wordsworth, Coleridge, Keats, Shelley, Byron, Lamb, Hazlitt, Austen and Scott. *Prerequisite:* 6 hours of 2000-level literature courses.

**4245. Jane Austen. 3.** A study of all the surviving work, published and unpublished, of this master of the modern novel, along with selected work by other authors supplying cultural and literary contexts. *Prerequisite:* 6 hours of 2000-level literature courses.

**4250. Poetry of the Victorian Age. 3.** A study of major poetic forms practiced by Tennyson, Browning, Arnold and their successors. *Prerequisite:* 6 hours of 2000-level literature courses.

**4260. English Prose Literature of the Victorian Age. 3.** A study of political, social, economic, religious and aesthetic ideas, as analyzed by representative authors from Carlyle and Mill to the end of the century. *Prerequisite:* 6 hours of 2000-level literature courses.

**4270. Classical Epic Poetry. 3.** Reading and discussion of major works of Greek and Latin epic poetry, centered on Homer and Vergil. Also includes consideration of the background of these works (both mythological and historical) and the development of the epic tradition in the ancient world. Cross listed with CLAS 4270. *Prerequisite:* WB.

**4280. Modern British Fiction. 3.** Covers the novel in British literature from 1920 to present. *Prerequisite:* 6 hours of 2000-level literature courses.

**4310. The English Novel: 18th Century to Early 19th Century. 3.** Spans the novel's formative (experimental) period, to its Gothic moment. Representative authors from Defoe to Scott. *Prerequisite:* 6 hours of 2000-level literature courses.

**4320. The English Novel: 19th Century to Early 20th Century. 3.** Spans the novel's Victorian (realist) manifestation, to its Modernist reconsideration. Representative authors from Dickens to Woolf. *Prerequisite:* 6 hours of 2000-level literature courses.

**4340. Modern Poetry. 3.** A study of selected aspects of modern poetry, including poets, poems, poetics and other relevant matter, mainly in Britain and the United States, between the mid-19th century and present. *Prerequisite:* 6 hours of 2000-level literature courses.

**4360. American Prose: Early Through Mid-19th Century. 3.** A study of major fiction and relevant non-fiction, written in America from the beginning through the middle of the 19th century. *Prerequisite:* 6 hours of 2000-level literature courses.

**4370. American Prose: 1865-1920. 3.** A study of major fiction written in the late-19th and early-20th centuries in relation to rise of realism and naturalism. *Prerequisite:* 6 hours of 2000-level literature courses.

**4430. Modern American Fiction. 3.** Covers the novel in American literature from 1920 to present. *Prerequisite:* 6 hours of 2000-level literature courses.

**4450. African American Novel. 3. [D◀(none)]** Considers aesthetic dimension and cultural matrix of novels written by Black Americans. Cross listed with AAST 4450. *Prerequisites:* AAST 1000, any AAST 2000 level course, junior/senior standing, six hours of 2000-level literature courses in ENGL.

**4455. Literature of Enslavement. 3-4 (Max. 4). [D◀(none)]** Students engage in an in-depth study of the literary voices that emerged from the history of enslavement in the Americas from colonial times through the end of Reconstruction in 1877. Dual listed with ENGL 5455; cross listed with AAST 4455. *Prerequisites:* AAST 1000, any AAST 2000-level course, and junior/senior standing, or six credit hours of literature courses in ENGL.

**4460. American Indian Literature. 3. [WC◀(none)]** Advanced critical study of the history of American Indian literature, emphasizing the authors' views of social change. Cross listed with AAST 4460. *Prerequisite:* 6 hours of 2000-level literature courses.



**4470. Studies in Chicano Folklore. 3. [CH,D◀(none)]** Provides a survey of the origins, development and contemporary folklore of the Mexican American Chicano people of the United States with comparative relation to Mexico and other groups in the United States. Cross listed with CHST 4470. *Prerequisites:* CHST 1100 and WA.

**4480. Regional Literature of the U.S.: The West. 3.** Encompasses major themes and writers in western American literature. *Prerequisite:* 6 hours of 2000-level literature courses.

**4500. American Folklore. 3.** A study of American folklore, emphasizing verbal art. Students read primary sources, as well as some critical and theoretical work. Includes folklore fieldwork. *Prerequisite:* 6 hours of 2000-level literature and/or cultural anthropology.

**4546. Agriculture: Rooted in Diversity. 3. [C,D◀(none)]** Addresses multiple themes related to diversity in agriculture with the goal of making visible the experiences of minorities and women in agriculture. Involves significant independent research, class discussion, project development, and development of oral and written communication skills. Establishes linkages with supporting disciplines. Cross listed with AGRI/AIST/CHST/FCSC/HIST/AMST 4546. *Prerequisites:* junior class standing or consent of instructor and concurrent enrollment or major in any of the following: ethnic studies, agriculture, American studies, anthropology, English, history, sociology, or women's studies.

**4600. Studies in \_\_\_\_\_. 1-6 (Max. 12).** Presents from semester to semester a variety of significant topics in American, English or other literatures. *Prerequisite:* 6 hours of 2000-level literature courses.

**4610. Special Studies Abroad in \_\_\_\_\_. 1-6 (Max. 6).** *Prerequisite:* 6 hours of 2000-level literature courses.

**4620. Independent Reading in \_\_\_\_\_. 1-3 (Max. for M.A. 3; Max. 6).** Involves independent study and research experience in given topic, person, movement in literature. *Prerequisites:* 6 hours of 2000-level literature courses, consent of instructor and permission of department chair.

**4630. English Honors Thesis. 1-3 (Max. 3).** Directed study under the supervision of an English honors thesis chairperson. Results in production of an English honors thesis. Maximum of three credits of ENGL 4630 can be applied to the degree. *Prerequisites:* consent of the Director of the English Honors Program, instructor and department chair.

**4635. English Department Honors. 0.** Satisfactory completion of this course indicates that English Departmental Honors have

been conferred on the student. *Prerequisites:* successful completion and defense of English Honors thesis.

**4640. Studies in Emerging Fields and Approaches. 3 (Max. 12).** Presents from semester to semester a variety of significant topics in emerging fields or approaches to literature written in English. *Prerequisite:* six hours of 2000 level literature courses.

**4710. Research Writing for ESL Students. 3.** A course in university research techniques and writing for graduate students for whom English is a second language. *Prerequisite:* consent of instructor.

**4750 [3750]. Fundamentals of Linguistics. 3.** Introduction to fundamentals of linguistic study, including phonology, morphology, semantics, pragmatics, and syntax, with a focus on the application of linguistic theory. Cross listed with ANTH/LANG 4750. *Prerequisite:* 8 hours of foreign language.

**4770 [3770]. Sociolinguistics. 3.** Following an introduction to the fundamentals of linguistic study, an examination of the relationship and interactions among language, society, and culture, including linguistic and social behaviors with regard to the creation and modification of cultural identity. Cross listed with ANTH/LANG 3770. *Prerequisite:* 8 hours of foreign language.

**4780. History of the English Language. 3.** Considers major sources of change in the English language historically, as well as some of the internal and external catalysts for the process. Identical to ANTH 4780. *Prerequisite:* ENGL 4750.

**4785. Linguistics, Language Teaching and Social Context. 3.** Introduces prospective teachers of English as second language to the basic components of language and to the social aspects of human language use. Explores a variety of concepts about language: how it is used and perceived, how languages change, how diverse cultures respond to such changes. Cross listed with LANG 4785. *Prerequisite:* WB.

**4830. Victorian Women's Lives: Their Art, Literature and Culture. 3. [CA◀(none)]** An interdisciplinary approach to the study of women's issues in art, using literary, cultural and sociological texts to enlarge the art historical basis. Topics include "domestic goddess," class issues, racial questions, working women, prostitution, education, marriage and divorce. Dual listed with ENGL 5830; cross listed with ART/WMST 4830. *Prerequisites:* ART 2020, WMST/ENGL 1080.

**4950. The American Dream in Literature. 3.** A study of literary reflections of how certain cultural hopes, expectations and assumptions in the American experience have been

enunciated, realized, frustrated and contradicted. Focuses on American literature of the 19th and 20th centuries. *Prerequisite:* 3 hours of 2000-level literature courses, 3 hours of American history.

**4970. Writing Internship. 3 (Max. 6).** Students work 6-8 hours per week as "writing interns" for a private business or public agency, performing specific writing/editing tasks for that client. Students are supported and enabled through a series of classroom sessions and individual meetings with the course instructor. Formal progress reports and a comprehensive final report are required. *Prerequisite:* successful completion of ENGL 4010, 4020, or 4050.

**4980. Numerical Imaginings 3.** An introduction to mathematical and statistical studies in literature and the literary tradition. *Prerequisites:* completion of QA and QB requirements, 6 hours of 2000-level literature courses.

**4990. Senior Seminar in English Studies. 3. [WC◀COM3]** Considers methods, theories and history of the study of literature and writing. In readings, discussion, as well as oral and written presentations, students seek a broad perspective on knowledge and skills gained throughout study in the English major. *Prerequisite:* advanced (senior) standing in English.

**5000. Studies In: 1 - 8 (Max. 8).** Provides an opportunity for specialized seminar approaches to subjects in literature. *Prerequisite:* graduate status or 12 hours of 4000-level work.

**5010. Practical Teaching in English Writing and Literature. 1 - 4 (Max. 4).** Practical and theoretical teaching methods and approaches for teachers of composition and literature courses. *Prerequisite:* graduate status or 12 hours of 4000-level work.

**5030. English as a Second Language: Theory and Method. 4.** Theoretical and practical explorations of the problems of teaching English as a second language. *Prerequisite:* graduate status.

**5061. Rhetorical Theory and Criticism. 3.** An investigation into how rhetorical theory, spanning from its ancient roots in Aristotelian thinking to its current postmodern components, operates in society. Explores how various critical methods can be utilized to gain a stronger understanding of public communication texts, including newspapers, speeches, music and film. Cross listed with COJO 5061; dual listed with ENGL 4061. *Prerequisites:* COJO 1040 and 3040 or ENGL 2035.

**5080. Graduate Apprenticeship. 1.** The graduate apprenticeship furthers a graduate student's professional development by allowing him/her to teach in a course other than Freshman Composition and to engage in a close working relationship with a faculty mem-

ber. Apprentices will engage in a full range of teaching activities, such as grading, constructing assignments and exams, lecturing, leading discussion, and so on. Does not apply to hour requirement for the degree. *Prerequisite:* graduate standing and permission of the English department chair.

**5090. Research Methods. 1.** An introduction to research methods and resources necessary for the advanced study of literature, rhetoric and composition, and creative writing. Satisfactory/Unsatisfactory only. *Prerequisite:* graduate standing in English.

**5220. Studies in Medieval Literature. 1-4 (Max. 8).** A seminar course in selected genres, figures, and themes in Medieval English literature. *Prerequisite:* graduate status or 12 hours or 4000-level work.

**5230. Studies in English Renaissance Literature. 1-4 (Max. 8).** A seminar in selected genres, figures, and themes of the sixteenth and early seventeenth centuries. *Prerequisite:* graduate status or 12 hours of 4000-level work.

**5250. Studies in Shakespeare. 1-4 (Max. 8).** To provide advanced students with the opportunity to study problems of text, sources, staging, theatrical history, and/or critical theory with reference to the works of William Shakespeare. *Prerequisite:* graduate status or 12 hours of 4000-level work.

**5270. Studies in 18c English Literature. 1-4 (Max. 8).** A seminar in selected genres, figures, and themes of restoration and eighteenth century English literature. *Prerequisite:* graduate status or 12 hours of 4000-level work.

**5280. Studies in 19c English Literature. 1-4 (Max. 4).** A seminar in selected genres, figures, and themes of the romantic and Victorian periods. *Prerequisite:* graduate status or 12 hours or 4000-level work.

**5290. Studies in 20c English Literature. 1-4 (Max. 8).** A seminar in significant writers of poetry, drama, fiction, and biography from the end of the nineteenth century to the present. *Prerequisite:* graduate status or 12 hours of 4000-level work.

**5310. Early American Literature. 4.** Seminar designed to acquaint graduate students with selected texts from the colonial period to 1800, relevant secondary works, and scholarly methods. *Prerequisite:* graduate status or 12 hours of 3000-4000 level work.

**5320. Studies in 19c American Literature. 1-4 (Max. 8).** A seminar designed to acquaint graduate students with selected principal works of American literature, relevant secondary works, and scholarly method. *Prerequisite:* graduate status of 12 hours or 4000-level work.

**5330. Studies in 20c American Literature. 1-4 (Max. 8).** A seminar in selected significant writers of poetry, drama, and prose from the end of the nineteenth century to the present. *Prerequisite:* graduate status or 12 hours of 4000-level work.

**5340. Intellectual Currents in Modern American Literature. 1-4 (Max. 4).** Devoted to the study of writers such as Marx and Freud and more recent American writers. *Prerequisite:* graduate status or 12 hours or 4000-level work.

**5360. Studies in Ethnic Literature. 1-4 (Max. 8).** A study of literature and culture of selected ethnic minorities. *Prerequisite:* graduate status or 12 hours of 4000-level work.

**5455. Literature of Enslavement. 3-4 (Max. 4).** Students engage in an in-depth study of the literary voices that emerged from the history of enslavement in the Americas from colonial times through the end of Reconstruction in 1877. Dual listed with ENGL 4455; cross listed with AAST 5455. *Prerequisites:* AAST 1000, any AAST 2000-level course, and junior/senior standing, or six credit hours of literature courses in ENGL.

**5520. History of Literacy Criticism: Enlightenment and 19th Century. 4.** Historical survey of the mainstream of European literary criticism, including the critics of antiquity and the Renaissance. *Prerequisite:* graduate status or 12 hours of 4000-level work.

**5530. Modern Critical Theory and Practice. 1-4 (Max. 4).** Major trends in modern poetics and practical criticism. *Prerequisite:* graduate status or 12 hours of 4000-level work.

**5540. Seminar in Creative Writing. 4.** Meets the theory requirement for graduate English majors concentrating in Creative Writing. Students review important texts about writing, review literary magazines, publishing procedures, and produce an independent writing project. *Prerequisite:* creative writing-4000 level and permission of instructor.

**5550. Independent Study in Creative Writing. 1-3 (Max. 6).** Guided independent writing of poetry or imaginative prose at an advanced level. Limited enrollment. No more than 9 hours of ENGL 4050 and ENGL 5550 combined may be counted toward the M.A. in English. *Prerequisite:* consent of instructor and graduate status or 6 hours of ENGL 4050.

**5560. Graduate Writing Workshop. 1-4 (Max. 28).** Graduate level workshop that emphasizes reading as well as writing in a specific genre (poetry, nonfiction, fiction) or in relation to a theme that combines genres, at the discretion of the instructor. *Prerequisite:* 12 hours of 4000-level creative writing or graduate status.

**5830. Victorian Women's Lives: Their Art, Literature and Culture. 3.** An interdisciplinary approach to the study of women's issues in art, using literary, cultural and sociological texts to enlarge the art historical basis. Topics include "domestic goddess," class issues, racial questions, working women, prostitution, education, marriage and divorce. Dual listed with ENGL 4830; cross listed with WMST 5830. *Prerequisites:* ART 2020, WMST 1080, ENGL 1080.

**5870. Women's Studies. 1-4. (Max 8).** A seminar in women writers and feminist criticism. *Prerequisite:* graduate status or 12 hours of 4000-level work.

**5880. Studies in Modern Fiction. 4.** A study of modern fiction, examining theory and practice, and covering works of English, European, and American origin. *Prerequisite:* graduate status or 12 hours of 4000-level work.

**5900. Practicum in College Teaching. 1-3 (Max. 4).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5910. English Communication Skills for International Teaching Assistants. 3.** Offered satisfactory/unsatisfactory only. Three credit hours for fee purposes. *Prerequisite:* graduate standing.

**5915. Tutorial. 1.** Graduate standing or consent of instructor. One credit hour for fee purposes.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: Credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5975. Independent Studies. 1-4 (Max. 6).** Independent study and research experience in a given topic, person, or movement in literature at an advanced level. *Prerequisite:* permission of chair; graduate standing.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

## Gender and Women's Studies

100 Ross Hall, 766-2733

FAX: (307) 766-2555

Web site: [www.uwyo.edu/wmst](http://www.uwyo.edu/wmst)

Director: Catherine Connolly

### Professors:

**CATHERINE CONNOLLY**, B.S. State University College at Buffalo 1984; M.A. State University of New York at Buffalo 1989; J.D. 1991; Ph.D. 1992; Professor of Sociology and Women's Studies 2004, 1998, 1992.

**COLLEEN DENNEY**, B.A. Louisiana State University 1981; M.A. 1983; Ph.D. University of Minnesota 1990; Professor of Art 2005, 1990; Professor of Gender and Women's Studies 2009.

**BONNIE ZARE**, B.A. Stanford University 1988; M.A. University of Wisconsin 1989; Ph.D. Tufts University 1994; Assistant Lecturer in English 1997; Professor of Gender and Women's Studies 2014, 2002.

### Associate Professors:

**SUSAN DEWEY**, B.A. Stony Brook University 1999; M.A. Syracuse University 2002; Ph.D. 2004; Associate Professor of Gender and Women's Studies 2014, 2010.

### Academic Professionals:

**BARBARA ELLEN LOGAN**, B.A. Queens College CUNY 1986; Ph.D. University of California Santa Cruz 2002; Assistant Academic Professional Lecturer 2011.

### Professor Emeriti:

Susan McKay (Distinguished Professor Emeritus in Gender and Women's Studies)

### Adjunct Faculty:

(see department section following name for academic credentials)

**Ulrich Adelt**, American Studies

**Treana Anastasia**, Gender and Women's Studies

**Stephanie Anderson**, Political Science

**Judith Antell**, Emeritus, American Indian Studies

**Cecelia Aragon**, Latina/o Studies, Theatre and Dance

**Christin Covello**, Gender and Women's Studies

**Susan C. Frye**, English

**Teena Gabrielson**, Political Science

**Anne Guzzo**, Music

**Alison Harkin**, Gender and Women's Studies

**Janice Harris**, Emeritus, English

**Cynthia Hartung**, Psychology

**Isadora Helfgott**, History

**Jeanne Holland**, English

**Angela Jaime**, Educational Studies

**Ed Janak**, Educational Studies

**Michelle Jarman**, WIND

**Chian Jones Ritten**, Agricultural and Applied Economics

**Marianne R. Kamp**, History

**Frieda E. Knobloch**, American Studies

**Renee Laegreid**, History

**Jennifer LaVanchy**, Modern and Classical Languages

**Jennifer Mayer**, University Libraries

**Leila Monaghan**, Disability Studies

**Hannelore Mundt**, German

**Danielle Pafunda**, English

**Tracey Patton**, African American and Diaspora Studies

**Tucker Readdy**, Kinesiology and Health

**Nancy Shea**, Gender and Women's Studies

**Nathaniel Smith**, Gender and Women's Studies

**Lilia Soto**, American Studies, Latina/o Studies

**Tonia St. Germain**, Gender and Women's Studies

**Grant Walsh-Haines**, Gender and Women's Studies

**Georgia Wheatley**, Casper College

### Advisory Committee:

Stephanie Anderson (Political Science)

Cecelia Aragon (Latina/o Studies, Theatre and Dance)

Alison Harkin (Gender and Women's Studies)

Isadora Helfgott (History)

Angela Jaime (Educational Studies)

Michelle Jarman (WIND)

Marianne Kamp (History)

Renee Laegreid (History)

Jennifer LaVanchy (Modern and Classical Languages)

Danielle Pafunda (English)

Chian Jones Ritten (Agricultural and Applied Economics)

The Gender and Women's Studies Program offers an interdisciplinary course of study that examines the relevance of sex, gender and sexuality in history, societies, and cultures. Students may earn a major, minor, or graduate minor in Gender and Women's Studies, or a minor or graduate minor in Queer Studies. A faculty advisor is assigned to the student upon declaration of a major or minor.

Students graduating with a degree in Gender and Women's Studies will have skills to succeed in a variety of settings indicated by their ability to:

1. conduct interdisciplinary feminist analysis.
2. examine and critique ideological assumptions underlying social institutions and systems of representation, including but not limited to assumptions regarding gender, race, class, nationality, disability, age, and sexual orientation.
3. comprehend the impact of gender on individuals' historical and contemporary agency, and how the ability to express agency has shaped people's lives in various geographical settings.

### Major requirements

For the gender and women's studies major, the student must complete 33 credit hours of gender and women's studies courses. All courses must be completed with a grade of "C" or better.

#### Core Courses (12 credit hours)

1. Introductory Course: (3 credits)  
Choose ONE from:
  - a. WMST 1080: Intro to Women's Studies or
  - b. WMST 2000: Intro to GLBTQ/NS Studies or
  - c. WMST 1900: Women & Leadership
2. Theory/Methods Courses (9 credits)
  - a. WMST 3710: Gender & Humanities and
  - b. WMST 2500: Gender & Society or WMST 4210: Feminist Research Methods; and
  - c. WMST 4700: Feminist Theories

#### Free Electives: 21 credit hours.

Students may choose from our full complement of courses to complete their major requirements.

Students have the option to do 21 hours in one of the following areas, or a combination in one or more areas, or create an independent path under consultation with the advisor. Possible areas of emphasis include:

Culture and Representation; Science, the Body and Sexualities; Social Policy and Social Justice; Independent Path. (see advisor for list of offerings)

As part of their 21 free elective hours students have the option of pursuing internships (WMST 4970) within the program but should recognize that internships require both a 3.3GPA and consent of instructor.

## Gender and Women's Studies with Honors

Honors in Gender and Women's Studies recognizes academically ambitious students who have excelled in their undergraduate careers, and who are ready for graduate school and/or employment in the public or private spheres. Requirements include an overall minimum GPA of 3.5 and the completion of WMST 4965, Senior Honors Project. Students should typically plan for the Senior Honors Project in consultation with their advisor during their junior year. Students in UW Honors Program, McNair Scholars Program, or other departments that require completion of an independent research project may dovetail their honors work in GWST with those programs.

For students beginning in Fall 2015, Honors in Gender and Women's Studies requires the completion of 3 semesters of foreign language or sign language, or a concentration in quantitative analysis.

### Minor Requirements

For the Gender and Women's Studies minor, students must complete 18 hours of WMST course work including one of the following core courses: WMST 1080, 3500, 3710, 4210 or 4700. A minimum of 12 hours of credit in the minor must be exclusive of hours earned in the student's major. Nine of the required hours must be 3000-level or above. All classes for the minor must be completed with a grade of "C" or better.

### Minor in Queer Studies

The Queer Studies minor requires the completion of 18 hours of classes, including WMST 2000-Intro to LGBTQ/NS, and nine or more credits at the 3-4000 level. Each semester, students, in consultation with a queer studies advisor, will choose elective courses. Independent projects or internships will be encouraged.

An interdisciplinary, independent Queer Studies advisory committee advises the program on curriculum, scheduling and coordination. A faculty advisor is assigned to the student on declaration of the minor.

The advisory board for the minor includes:

Rachel Watson, chair, Molecular Biology  
 Ulrich Adelt, American Studies  
 Christine Boggs, Outreach School  
 Dolores Cardona, Assoc.  
 Dean of Students  
 Cathy Connolly, Gender and  
 Women's Studies  
 Susanna Goodin, Philosophy  
 Mark Helmsing, Secondary Education

Beth Loffreda, American Studies  
 Danielle Pafunda, English  
 Eric Teman, Professional Studies

## Graduate Study

Students interested in a graduate minor in Gender and Women's Studies or Queer Studies should contact the Director of the Program for enrollment.

### Minor in Gender and Women's Studies

A total of 12 hours of course work is required, including nine hours at the 5000-level and including WMST 5710, Feminist Theoretical Perspectives. In addition, students are encouraged to complete at least one independent study (WMST 5975) with a GWST faculty member. When practical, students should include a GWST faculty member on their thesis, dissertation or Plan B committees. Students in professional programs without a culminating research project (or those whose graduate work is outside of GWST) can meet this requirement through alternative means.

### Minor in Queer Studies

A graduate minor in Queer Studies requires the completion of 12 hours, including WMST/ENGL 5000, Queer Theory, a minimum of 6 hours at the 5000+ level, and a capstone experience or independent study. For committee-based degree programs with QS content it is expected that the student will include one committee member from QS.

## Gender and Women's Studies (WMST)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**1020. Intellectual Community: Women in Sports. 3. [I,L♦(none)]** An overview of the role of American women in sports. Studies concepts about women, sports, and society in contemporary and historical perspectives. Topics include: history of women in sports, physiological, social and cultural considerations, media image, and careers. Cross listed with HLSC 1020.

**1030. Social Justice in the 21st Century. 3. [I,D♦(none)]** Appropriate for students interested in diversity and social justice. Topics covered through an interdisciplinary study of people and society range from identity, critical thinking, empowerment, role models, stereotyping, institutional discrimination, and tolerance. The key lynchpin is active participation

in the development and maintenance of just communities. Cross listed with CHST/AAST/AMST/AIST 1030. Enrollment preference will be given to We The People FIG students.

**1080. Introduction to Women's Studies. 3. [CH,D♦H]** Introduction to key issues in women's studies. Topical examination of women's participation in, and relationship to, institutions of society, such as family and school, as well as processes and activities, such as work, art, literature and politics in historical and cross-cultural analysis. Cross listed with ENGL 1080. (Offered both semesters)

**1090. Women in Contemporary Society. 1. [I♦(none)]** Exposes students to the major questions in Women's Studies. Examines women's participation in, and relationship to, institutions and society, such as family and school, as well as activities such as work, art, literature and politics in historical analysis.

**1101. First-Year Seminar. 3. [(none)♦FYS] 1900 [4510]. Women and Leadership. 3. [O,L♦(none)]** Students examine theoretical, historical and cultural aspects of leadership, values in leadership, gender differences in leadership styles, and practical applications of leadership skills through oral communication and information literacy. Individual and collaborative work is expected. Cross listed with SOWK 1900.

**2000. Introduction to LGBTQ/NS Studies. 2. [C,D♦H]** Lesbian, Gay, Bisexual, Transgender, Queer and New Sexuality Studies (LGBTQ/NS) explores the interdisciplinary study of sexuality and its importance to the organization of social relations and social institutions. Primary among its concerns is the study of the lives, the politics, and the creative work of sexual minorities.

**2001. Gender and Ethnicity in Science. 3.** Covers factors affecting the performance and retention of women and ethnic minority students in science careers, and science as a social construct. Cross listed with CHST 2001.

**2060. Topics in Women's Studies. 1-4 (Max. 6).** Popular and current topics in women's studies.

**2070. Gender and Religion. 3.** Aims to help students understand how religion constructs and reinforces gender roles in religion and society. Looks at traditional gender roles in Christianity and the transformation they have undergone in the past century or so. Cross listed with RELI 2070.

**2135. Women and Aging. 3.** Focuses on women and the aging process with emphasis given to both the problems and promises of aging. Topics to be explored within a multi-cultural, sociological framework include the

definition of self, relationships, community, health and health care, work and service, retirement, economic realities and new perspectives on aging. Cross listed with FCSC/SOC/NURS 2135. *Prerequisite:* ENGL/SOC/WMST 1080 or SOC 1000 or FCSC/NURS/SOC 2120.

**2389. History of Women in the American West. 3. [D♦(none)]** Surveys the roots of society's marginal historical depiction of women in the American West from the colonial period through the twentieth century. From the perspective of race, class, ethnicity, and gender, the course focuses on the development of a multi-dimensional understanding of women's roles using an interdisciplinary approach. Cross listed with HIST 2389.

**2420 [2500]. Women and Politics. 3.** Describes and compares status and political activity of women in America with those of women in other societies in order to explore causes, methods and results of political involvement by women. Cross listed with POLS 2420. *Prerequisite:* POLS 1000 or consent of instructor.

**2500 [3500]. Gender and Society. 3. [WB♦COM2]** Examines the social construction of gender using interdisciplinary methods of analysis. The readings and assignments emphasize the importance of denaturalizing the gender stereotypes and norms that impact women's and men's lives. Intersections between gender, race, class, age, and sexual orientation are examined within their cultural contexts. This course will prepare students for advanced work in Gender and Women's Studies. *Prerequisite:* WMST 1080 or cross listed equivalent.

**2700. Gender and Disability. 3. [D♦H]** Disability studies draws upon critical theory to investigate disability as a discursive construction. Investigates how intersecting conceptions of disability and gender have shaped cultural meanings and the social positioning of specific groups, especially women with disabilities. Topics include non-normative embodiment, issues of representation and subjectivity, and the politics of health, sexuality, and care. Cross listed with WIND 2700.

**3050. Cultures of Nature in the United States. 3.** Uses artistic, philosophical, historical and literary material to investigate how ideas about and representations of nature have changed over time in the U.S. Culminates in an examination of a wide range of contemporary environmental ideas within this broad historical and cultural context. Cross listed with ENR/AMST 3050. *Prerequisite:* 2000-level course in one of the following departments: AMST, American history, American literature, or a 2000-level course approved for the ENR program.

**3150. Feminist Christian Thought. 3.** In recent decades Christianity has undergone important changes with regard to the place of women in the church. Addresses historical and theological discussions that have accompanied those changes. Also addresses how feminism and religion affect one's belief system. Cross listed with RELI 3150. *Prerequisites:* junior standing and at least one course in women's studies or religious studies.

**3200. Perspectives in Chicana Studies 3. [D♦(none)]** An interdisciplinary introduction to the study of the history, culture, gender relations, and contemporary political, economic status of Chicanas/Mexican American women. Examines the origins, development of Chicana studies as a major emphasis in Chicano/Chicana studies. Cross listed with CHST 3200. *Prerequisite:* CHST 1100.

**3300. Gender Development. 3.** Examines the development of gender roles and sex differences. Incorporates developmental, clinical and social psychological perspectives. Includes examination of biological, social and cultural factors on gender development; conceptualizations of masculinity, femininity and androgyny; differences in play behavior in boys and girls; evaluation of psychological measurement and research regarding gender development and sex differences. Cross listed with PSYC 3300. *Prerequisite:* PSYC 2300 or 4300.

**3400. Popular Music and Sexualities. 3. [CH,D♦(none)]** Looks at ways in which popular music has intersected with sexual and gendered identities as a means and expression of both oppression and liberation. Cross listed with AMST 3400. *Prerequisite:* WA.

**3610. Non-Western Women Writers. 3.** Examines literature written by women in non-western cultures. The geographical region, time period, and genres of literature may vary by semester. Analyzes representations of such topics as family, marriage, sexuality, community, and colonialism as expressed in fiction, drama, literary non-fiction, and/or poetry. *Prerequisites:* ENGL 1010 or WMST 1080; junior standing.

**3650. Contemporary US Immigrant Women Writers. 3. [CH,D♦(none)]** A study of contemporary American literature (fiction, autobiography, and poetry) by Mexican, Caribbean (Haitian and Dominican) and Arab immigrant women and daughters of immigrant parents. Film, other visual arts, and a range of essays enrich students' analysis of the literary texts. *Prerequisite:* WMST 1080, or WA, or junior standing.

**3710. Gender and Humanities. 3. [CH♦COM2]** Explores how men and women are imaged differently, studying the influence of representation on gender (including representations in literature, film, art, popular culture, and/or performance). Sharpens students' ability to analyze texts and images and investigate those texts' messages about gender, sexuality, ethnicity and class. Cross listed with ENGL/ART 3710. *Prerequisite:* WMST 1080 or ENGL 1010. (Offered once a year)

**3800. Chicanas/os in Contemporary Society. 3. [CS,D♦(none)]** Focuses on three major movements within the Chicana/o community; labor, nationalism, and feminism. Students will assess these three movements to determine what role they have played in transforming the social conditions and political identity of the Chicana/o and Latina/o population in the US. Cross listed with AMST/CHST 3800. *Prerequisites:* CHST 1100 or WMST 1080 or AMST 2010.

**4050. Minority Sexual/Gender Identity Issues in Education. 3.** How youth of minority sexual and gender identities have been educated: the challenges they experience in U.S. K-16 schools, the risk factors related to academic success (health, safety, and emotional well being), and strategies to create safe, caring, and inclusive learning environments for all youth. Dual listed with WMST 5050; cross listed with EDCI 4050. *Prerequisites:* completion of WA and WMST 2000 with C or better.

**4100. U.S. Latina/o Theater. 3. [CA,D♦(none)]** Designed to provide an overview of United States Latina/o Theater. Through a variety of delivery methods, students are instructed on the various categories that directly impact U.S. Latina/o Theater such as political theatre, gay/lesbian theatre, border issues, race, class, gender, and sexuality. Cross listed with CHST 4100. Dual listed with WMST 5100. *Prerequisite:* 6 hours of CHST or WMST.

**4155 [4920, 4950]. Women, War and Health. 3. [CS,G♦(none)]** Focuses on the physical and psychological health of women and children as influenced by armed conflict. Examines the psychosocial, public health, and socioeconomic effects of living in contemporary war zones or conditions of threatened war. Key international documents that address effects upon women and children are discussed in order to evaluate feminist initiatives to prevent and mediate the consequences of war. Dual listed with WMST 5155; cross listed with INST/NURS 4155. *Prerequisite:* upper-division standing, lower division social or psychological science course. (Offered every other year)

**4175 [4940]. Gender, Women, and Health. 3. [CS,G◀(none)]** Focuses on issues of gender, women and health, including the effects of gender bias in medical research and health care practices and policies. Health care issues of specific concern to women, both nationally and internationally will be examined. Cross listed with INST/NURS 4175. *Prerequisite:* upper-division standing, lower division social or psychological science course. (Offered every other year)

**4190. Women and the Bible. 3.** Explores depictions, roles and statuses of women found in the Bible, both Old and New Testaments. Introduces ways biblical portraits of women have been used in more recent centuries to develop theologies of, by, and for women. Cross listed with RELI 4190. *Prerequisite:* junior standing or permission of instructor.

**4200. Gender and Race in the Economy. 3. [D◀(none)]** Focuses on the role gender and race play in the economy; specifically the way that gender and race affect economic outcomes for individuals in the United States. Cross listed with AGECE 4200. Dual listed with WMST 5200. *Prerequisites:* AGECE 1020 or equivalent, or SOC 1000, or WMST 1080, and WB.

**4210. Feminist Research Methods. 3.** Introduces students to feminist methods of research problem formulation, data acquisition, analysis, and presentation of research findings regarding topics related to sex, gender and sexuality. Requires students to participate in research projects. Dual listed with WMST 5210. *Prerequisites:* Nine hours of WMST or permission of the instructor.

**4233. Race, Gender, Ethnicity in the Media. 3. [WC,D◀COM3]** Examine the role mass media plays in the Black community and other racial, ethnic, gendered, and socioeconomic communities. Students will develop a critical understanding of the way the mass media uses stereotypes and prejudice to influence society's views about ethnic minorities and women in contemporary United States society. Cross-listed with AAST 4233 and COJO 4233; dual-listed with WMST 5233. *Prerequisites:* AAST 1000, any AAST 2000-level course, or three hours of any level of WMST courses, or three hours of any level COJO courses; WB, and junior/senior standing.

**4240. Global Sex Work and Trafficking. 3. [G◀(none)]** Drawing upon case studies from Africa, Asia, the Americas and Europe, this course explores the gendered intersections of power and privilege through the lens of sex work, broadly defined as the exchange of intimacy for something of value, and traf-

ficking, defined as coerced forms of sex work. Dual listed with WMST 5240; cross listed with INST 4240. *Prerequisite:* 3-6 hours of WMST or INST.

**4300. The Politics of Sexuality. 3.** Addresses issue of how sexuality has become gendered with different meanings for both males and females as to reproductive behavior, especially how women's bodies are defined in sexual terms. *Prerequisite:* WMST 1080, 3500 or 3710. (Offered every other year)

**4330. European Gender and Women's History. 3.** The experiences of women and the history of gender from the Renaissance through the 19th century. Focuses on the changing notions of the masculine and the feminine through such historical episodes as the Reformation, the Enlightenment, the French Revolution and the Industrial Revolution. *Prerequisite:* HIST 1110 or 2110.

**4335. Women and Islam. 3.** Examines women's lives in Islamic societies from the seventh century to the present in the Middle East and throughout the world. Themes include women's position in Islamic law, society and culture, Western images of Muslim women, veiling and Islamist movements, theoretical readings on power, gender and agency. Cross listed with HIST 4335 and RELI 4335, dual listed with WMST 4335. *Prerequisite:* 6 hours in women's studies, international studies, religious studies, or history.

**4360. American Indian Women. 3.** Explores the lives of American Indian women in a variety of contexts through time. The complexity and diversity of Indian women's experiences throughout history are emphasized. Much of the class concerns Indian women's lives within the reality of European American colonization and its consequences for Indian peoples. Cross listed with AIST/SOC 4360. *Prerequisite:* 6 hours of 2000-level AIST classes.

**4400. Women and Work. 3. [WB◀(none)]** Surveys general patterns of women's paid and unpaid work in the U.S. and abroad. Offers reconceptualizations of the meaning of work in women's lives, as well as debates surrounding comparable worth, pay equity, women's work experience and women in the world economy. Cross listed with SOC 4400, dual listed with WMST 5400. *Prerequisite:* 6 hours of women's studies or sociology. (Offered once a year)

**4450. Ecofeminism. 3.** Focus is on issues of gender, women and ecology. Ecofeminist thinkers argue that there is no liberation for women and no solution to the ecological crisis without a fundamental shift in relationships of domination. Uniting the two movements results in a radical reshaping of modern socio-

economic relations. Dual listed with WMST 5450. *Prerequisite:* 6 hours in WMST, PHIL, and/or ENR.

**4500. Special Topics in Women's Studies. 1-4 (Max. 12).** Presents current research issues by visiting and regular faculty. *Prerequisite:* WMST 1080, 3500, 3710 or consent of instructor.

**4520. Gender and Sexuality in Postcolonial Writing. 3. [CH,G◀(none)]** Increases knowledge of history, cultural representations, and understandings of gender in formerly colonized areas. It engages with the provocative contributions of postcolonial theory and advances comprehension of the different issues confronted by women, men, and sexual minorities. Literature in different regions of the world may be highlighted. Dual listed with WMST 5520. *Prerequisites:* any two English/writing courses, or any WMST course.

**4540. Women, Crime and the Law. 3.** Addresses status of women as offenders and as victims in society and in the criminal justice system. Considers special role of women as professionals in the criminal justice system. Cross listed with CRMJ 4540. *Prerequisite:* WMST/ SOC 1080, 3500 or SOC 2400. (Offered every other year)

**4580. Gender, Global Change, and Development. 3. [CS,G◀(none)]** Examines the global intersections of gender and public policy through its analysis of five central themes: [1] international development discourse in practice; [2] feminized labor and migration; [3] women's unequal access to resources (including land ownership and education); [4] agricultural production and sustainability; [5] health, reproduction and mothering. Dual listed with WMST 5580; cross listed with INST 4580. *Prerequisite:* 3-6 hours of WMST or INST courses. (Offered once a year)

**4590. Women of India. 3. [G◀(none)]** Introduces students to concepts that influence the daily lives of contemporary women from India. Organized around two themes: how women have made history in India, and how today's women are performing, confronting and modifying cultural traditions. *Prerequisites:* WA and a CS or CH course.

**4650. Women, Gender & Migration. 3.** From an international context and perspective, this course examines the gendered transformations immigrant women experience. Gender, theories of international migration, assimilation, race, ethnicity, and identity transformation serve as categories of analysis. From a cross-discipline comparative approach, we focus on women's lives to examine differences and similarities to complicate notions of im-

migration. Cross listed with AMST/CHST/INST 4650. Dual listed with WMST 5650. *Prerequisites:* Junior standing and 6 hours of AMST, CHST, INST, and/or WMST coursework or instructor approval.

**4675. U.S. Women of Color. 3. [D◀(none)]** Examines in comparative perspective the social conditions that shape the experiences of Chicanas/Latinas in the U.S. Students gain an understanding of how the intersection of race, class, gender, and sexuality shape the lived experiences of U.S. women of color through ideological, economic, and political forces. Cross listed with AAST/CHST 4675. *Prerequisite:* junior standing and/or a combination of 3-6 hours of any level of CHST, WMST, or AAST coursework.

**4700. Feminist Theories. 3. [WC◀(none)]** Surveys contemporary feminist theories and places those theories within the framework of social, literary, and artistic criticism. Uses feminist theories to address questions such as nature of meaning in literature and artistic forms; construction of science; and identity of the individual as these phenomena are affected by gender construction. *Prerequisite:* 12 hours of women's studies. (Offered once a year)

**4770. Gender and Film. 3.** Investigates gender construction in mainstream, mainly contemporary Hollywood cinema. Readings of germinal essays in film theory and extensive viewing of films will provide the critical tools to understand how and why stereotypical images are presented, how and why the spectator is manipulated to identify with these images. Dual listed with WMST 5770. *Prerequisite:* WMST 1080, 3500 or 3710. (Offered once a year)

**4775. Language and Gender. 3.** Investigates the relationship between language use, linguistic categories, and gender categories. Examines the linguistic practices involved in the formulation, discussion, and performance of gender categories in a number of different cultures. Dual listed with WMST 5775; cross listed with ANTH 4775. *Prerequisite:* ANTH 1200, 2000.

**4780. History of Women Artists. 3.** Studies documented influence of women as subjects, makers and receivers of art. Emphasizes careers and works of women over a wide range of times and places and under a variety of social circumstances. Greatly emphasizes developments in the twentieth century. Cross listed with ART 4780; dual listed with WMST 5780. *Prerequisites:* ART 2010 or ART 2020 or 3 hours of Women's Studies courses; and WB.

**4830. Victorian Women's Lives: Their Art, Literature and Culture. 3. [CA◀(none)]** An interdisciplinary approach to the study of women's issues in art, using literary, cultural and sociological texts to enlarge the art historical basis. Topics include "domestic goddess," class issues, racial questions, working women, prostitution, education, marriage and divorce. Cross listed with ART/ENGL 4830, dual listed with WMST 5830. *Prerequisite:* Either ART 2020 or WMST/ENGL 1080. (Offered every other year)

**4960. Women's Bodies, Women's Minds. 3. [CS◀(none)]** Explores women's physiologic and psychologic development and the influences of patriarchal society upon the interpretation of what constitutes normalcy across the female life cycle. Historical, cultural and contemporary attitudes of the health care system and women's perspectives on menstruation, childbearing, breastfeeding and menopause will be analyzed. Cross listed with NURS 4960. *Prerequisite:* upper division status. (Offered every other year)

**4965 [4980]. Senior Honors Project. 3.** The student consults with the director/faculty supervisor to identify a topic and (a) produces a 30-40 page research paper or (b) a shorter 15-20 page paper plus a creative or service learning component, showing originality, firm knowledge of the discipline(s), and solid research skills, with a thesis defense as culmination. *Prerequisites:* WMST 4700, or concurrent enrollment with instructor consent, and a 3.5 gpa.

**4970 [4000]. Internship. 3.** Students gain practical experience in the application of principles learned in women's studies courses. Students will work with the director of women's studies internships to select a site; will intern approximately ten hours per week in the host organization; and will complete written assignments which reflect the student's work. Offered S/U only. *Prerequisites:* 12 semester hours of WMST coursework, 3.3 gpa and consent of instructor. (Offered both semesters)

**4975 [4970]. Independent Studies. 1-4.** Offers the advanced student the opportunity to pursue a topic of interest with the assistance and direction of an instructor in women's studies. *Prerequisite:* 6 hours in women's studies or consent of instructor.

**5000. Special Topics. 1-4 (Max. 8).** Presents findings from current research and new areas of inquiry into women's studies at the graduate level, by present and visiting faculty. *Prerequisite:* 18 hours of undergraduate women's studies.

**5050. Minority Sexual/Gender Identity Issues in Education. 3.** How youth of minority sexual and gender identities have been educated: the challenges they experience in U.S. K-16 schools, the risk factors related to academic success (health, safety, and emotional well being), and strategies to create safe, caring, and inclusive learning environments for all youth. Dual listed with WMST 4050; cross listed with EDCI 5050. *Prerequisites:* completion of WA and WMST 2000 with C or better; graduate standing; completion/concurrent enrollment in ADED 5260 or instructor approval.

**5100. U.S. Latina/o Theater. 3. [CA,D◀(none)]** Designed to provide an overview of United States Latina/o Theater. Through a variety of delivery methods, students are instructed on the various categories that directly impact U.S. Latina/o Theater such as political theatre, gay/lesbian theatre, border issues, race, class, gender, and sexuality. Cross listed with CHST 5100. Dual listed with WMST 4100. *Prerequisite:* 6 hours of CHST or WMST.

**5155. Women, War & Health. 3.** Focuses on the physical and psychological health of women and children as influenced by armed conflict. Examines the psychosocial, public health, and socioeconomic effects of living in contemporary war zones or conditions of threatened war. Key international documents that address effects upon women and children are discussed in order to evaluate feminist initiatives to prevent and mediate the consequences of war. *Prerequisites:* upper division standing, lower division social or psychological science course and instructor's consent.

**5175. Gender, Women & Health. 3.** Focuses on issues of gender, women and health, including the effects of gender bias in medical research and health care practices and policies. Health care issues of specific concern to women, both nationally and internationally are examined. *Prerequisites:* upper-division standing, lower division social or psychological science course. Dual listed with WMST 4175; cross listed with INST/NURS 5175.

**5200. Gender and Race in the Economy. 3.** Focuses on the role gender and race play in the economy; specifically the way that gender and race affect economic outcomes for individuals in the United States. Cross listed with AGEC 5200. Dual listed with WMST 4200. *Prerequisites:* AGEC 1020 or equivalent, or SOC 1000, or WMST 1080, and WB.

**5210. Feminist Research Methods. 3.** Introduces students to feminist methods of research problem formulation, data acquisition, analysis, and presentation of research findings regarding topics related to sex, gender

and sexuality. Requires students to participate in research projects. Dual listed with WMST 4210. *Prerequisites:* Nine hours of WMST or permission of the instructor.

**5233. Race, Gender, Ethnicity in the Media. 3.** Examine the role mass media plays in the Black community and other racial, ethnic, gendered, and socioeconomic communities. Students will develop a critical understanding of the way the mass media uses stereotypes and prejudice to influence society's views about ethnic minorities and women in contemporary United States society. Cross-listed with AAST 5233 and COJO 5233; dual-listed with WMST 4233. *Prerequisites:* AAST 1000, any AAST 2000-level course, or three hours of any level of WMST courses, or three hours of any level COJO courses; WB, and junior/senior standing.

**5240. Global Sex Work and Trafficking. 3.** Drawing upon case studies from Africa, Asia, the Americas and Europe, this course explores the gendered intersections of power and privilege through the lens of sex work, broadly defined as the exchange of intimacy for something of value, and trafficking, defined as coerced forms of sex work. Dual listed with WMST 4240; cross listed with INST 5240. *Prerequisite:* 3-6 hours of WMST or INST.

**5330. European Gender History. 3.** The experiences of women and the history of gender from the Renaissance through the nineteenth century. Focuses on the changing notions of the masculine and the feminine through such historical episodes as the Reformation, the Enlightenment, the French Revolution and the Industrial Revolution. Dual listed with WMST 4330; cross listed with HIST 4330/5330. *Prerequisite:* HIST 1110 or 2110.

**5335. Women and Islam. 3.** Examines women's lives in Islamic societies from the seventh century to the present in the Middle East and throughout the world. Themes include women's position in Islamic law, society and culture, Western images of Muslim women, veiling and Islamist movements, theoretical readings on power, gender and agency. Cross listed with HIST 5335, dual listed with WMST 4335. *Prerequisite:* 6 hours in women's studies, international studies, religious studies, or history.

**5360. American Indian Women. 3.** Explores the lives of American Indian women in a variety of contexts through time. The complexity and diversity of Indian women's experiences throughout history are emphasized. Much of the class concerns Indian women's lives within the reality of European American colonization and its consequences for Indian peoples. Dual

listed with WMST 4360; cross listed with SOC 5360. *Prerequisite:* 6 hours of AIST 2000-level classes.

**5400. Women and Work. 3.** Surveys general patterns of women's paid and unpaid work in the U.S. and abroad. Offers reconceptualizations of the meaning of work in women's lives, as well as debates surrounding comparable worth, pay equity, women's work experience and women in the world economy. Dual listed with WMST 4400; cross listed with SOC 4400/5400. *Prerequisite:* six hours of women studies or sociology.

**5450. Ecofeminism. 3.** Focus is on issues of gender, women and ecology. Ecofeminist thinkers argue that there is no liberation for women and no solution to the ecological crisis without a fundamental shift in relationships of domination. Uniting the two movements results in a radical reshaping of modern socio-economic relations. Dual listed with WMST 4450. *Prerequisite:* six credits from women's studies, philosophy, and/or ENR.

**5500. Readings in Women's Studies. 3.** An interdisciplinary course at graduate level focusing on feminist criticism and theory, which draws on current debates in feminist analysis from the general areas of history, literature and social science, to inform students of reformulations of research and unresolved issues. Identical to HIST 5500. *Prerequisite:* graduate status, 12 hours of 4000-level work.

**5520. Gender and Sexuality in Postcolonial Writing. 3. [CH,D♦(none)]** Increases knowledge of history, cultural representations, and understandings of gender in formerly colonized areas. It engages with the provocative contributions of postcolonial theory and advances comprehension of the different issues confronted by women, men, and sexual minorities. Literature in different regions of the world may be highlighted. Dual listed with WMST 4520. *Prerequisites:* any two English/writing courses, or any WMST course.

**5580. Gender, Global Change, and Development. 3.** Examines the global intersections of gender and public policy through its analysis of five central themes: [1] international development discourse in practice; [2] feminized labor and migration; [3] women's unequal access to resources (including land ownership and education); [4] agricultural production and sustainability; [5] health, reproduction and mothering. Dual listed with WMST 4580; cross listed with INST 5580. *Prerequisite:* 3-6 hours of WMST or INST courses. (Offered once a year)

**5590. Women of India. 3.** Introduces students to concepts that influence the daily lives of contemporary women from India. Organized around two themes: how women have made

history in India, and how today's women are performing, confronting and modifying cultural traditions. *Prerequisites:* USP WA class and a CS or CH class.

**5650. Women, Gender & Migration. 3.** From an international context and perspective, this course examines the gendered transformations immigrant women experience. Gender, theories of international migration, assimilation, race, ethnicity, and identity transformation serve as categories of analysis. From a cross-discipline comparative approach, we focus on women's lives to examine differences and similarities to complicate notions of immigration. Cross listed with AMST/CHST/INST 5650. Dual listed with WMST 4650. *Prerequisites:* Junior standing and 6 hours of AMST, CHST, INST, and/or WMST coursework or instructor approval.

**5710. Feminist Theoretical Perspectives. 3.** Intensive introduction to the epistemology and application of a wide range of trans-historical, trans-cultural, and trans-national feminist theories. Students will be asked to apply self-selected feminist theories to their own thesis work and graduate fields, as well as to current examples of sex, gender, gender performance, and gendered coding in American media. *Prerequisite:* graduate standing.

**5770. Gender and Film. 3.** Investigates gender construction in mainstream, mainly contemporary Hollywood cinema. Includes readings of seminal essays in film theory and extensive viewing of films, which provide critical tools to understand how and why stereotypical images are presented, how and why the spectator is manipulated to identify with these images. Dual listed with WMST 4770. *Prerequisites:* WMST 1080, 3500 or 3710.

**5775. Language and Gender. 3.** Investigates the relationship between language use, linguistic categories, and gender categories. Examines the linguistic practices involved in the formulation, discussion, and performance of gender categories in a number of different cultures. Dual listed with WMST 4775; cross listed with ANTH 5775. *Prerequisite:* ANTH 1200, 2000.

**5780. History of Women Artists. 3.** Studies documented influence of women as subjects, makers and receivers of art. Emphasizes careers and works of women over a wide range of times and places and under a variety of social circumstances. Greatly emphasizes developments in the twentieth century. Dual listed with WMST 4780. *Prerequisites:* ART 2010 or ART 2020 or 3 hours of Women's Studies courses; and WB.



**5830. Victorian Women's Lives: Their Art, Literature, and Culture. 3.** An interdisciplinary approach to the study of women's issues in art, using literary, cultural and sociological texts to enlarge the art historical basis. Topics include "domestic goddess," class issues, racial questions, working women, prostitution, education, marriage and divorce. Dual listed with WMST 4830; cross listed with ENGL 5830. *Prerequisite:* ART 2020 or ENGL/WMST 1080.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Students are expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 14).** Graduate level course designed for students who are involved in research for their thesis project. Also designed for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5970. Independent Studies. 1-4 (Max. 8).** Allows the graduate student to pursue studies in gender issues with the supervision of an instructor from the Women's Studies faculty. *Prerequisite:* graduate standing.

**5990. Internship. 1-12 (Max. 12).** *Prerequisite:* graduate standing.

## Geography

207 Arts and Sciences Building, 766-3311

FAX: (307) 766-3294

Web site: [www.uwyo.edu/geography](http://www.uwyo.edu/geography)

Department Chair: Gerald R. Webster

### Professors:

**WILLIAM J. GRIBB**, B.S. Wayne State University 1973; M.A. University of Colorado 1975; Ph.D. Michigan State University 1982; Professor of Geography 2014, 1988.

**GERALD R. WEBSTER**, B.A. University of Colorado - Denver 1975; M.S. Western Washington University 1980; Ph.D. University of Kentucky 1984; Professor of Geography 2007.

### Associate Professors:

**TOM A. MINCKLEY**, B.S. Northern Arizona University 1987; University of Arizona 1996; M.A. University of Oregon; Ph.D. 2003; Associate Professor of Geography 2014, 2012.

**JACQUELINE J. SHINKER**, B.S. University of Arizona 1996; M.A. University of Oregon 1999; Ph.D. 2003; Associate Professor of Geography 2011, 2005.

### Assistant Professors:

**YI-LING CHEN**, B.S. National Taiwan University 1989; M.S. 1992; Ph.D. Rutgers University 2000; Assistant Professor of Geography 2010.

**CARL J. LEGLEITER**, B.S. Montana State University 2002; M.A. University of California Santa Barbara 2004; Ph.D. 2008; Assistant Professor of Geography 2009.

**CHEN XU**, B.S. Sichuan University, China 1999; M.S. Sam Houston State University 2005; Ph.D. Texas A&M University 2010; Assistant Professor of Geography 2014.

### Senior Research Scientist:

**JEFFREY D. HAMERLINCK**, B.S. University of North Dakota 1988; M.P. University of Wyoming 1992; Ph.D. University of Colorado - Boulder 2011; Director, Wyoming Geographic Information Sciences Center (WyGISC) 2004.

### Assistant Research Scientist:

**SHANNON E. ALBEKE**, B.A. University of Colorado, Boulder 1997; Ph.D. University of Georgia 2010. Assistant Research Scientist, 2010.

**PADDINGTON HODZA**, BSC, University of Zimbabwe, 1994; MSC, University of Zimbabwe, 1998; Ph.D. West Virginia University, 2007; Assistant Director, Wyoming Geographic Information Sciences Center (WyGISC); Assistant Research Scientist, 2013.

### Adjunct Faculty:

Steven D. Prager

### Professor Emeritus:

John L. Allen, William L. Baker, Ronald E. Beiswenger, Deborah D. Paulson, Thomas Buchanan

The department of Geography is comprised of faculty with interests and expertise in geography, planning, and resource management. The department focuses upon the following:

1. The origin and nature of the physical and cultural environment, how the physical environment and its natural resources form, and how the environment and natural resources affect the quality of life.
2. The ways in which people and institutions affect natural resources and the environment.
3. The variety of methods and techniques with which we solve or prevent problems through the planning and management of natural resources.
4. The ways in which human institutions (e.g. political, economic, social) interact to produce diverse human landscapes.

## Four Fundamentals of Geographic Learning

The Department of Geography has identified four fundamental goals of geography to emphasize in its undergraduate curriculum. These four goals are at the intersection of topically important areas in the discipline of geography. We continue to evaluate student learning in our program to insure our curriculum addresses these fundamental goals as effectively as possible.

### Goal 1 – Human-Environment Interaction

Students will be able to identify and explain how humans modify the environment and affect Earth's biophysical systems through their human activities.

### Goal 2 – Biophysical Systems

Students will be able to identify and explain an array of patterns, processes, and interactions in Earth's biophysical systems occurring at different spatial scales.

### Goal 3 – Human-Cultural Systems

Students will be able to identify and explain an array of patterns, processes, and interactions across Earth's human landscapes at different spatial scales.

### Goal 4 – Geographic Thought, Methods and Analysis

Students will understand basic geographic concepts and ideas, and will be capable of using them to inform their work. Students will also demonstrate the ability to select and use appropriate tools and techniques for addressing geographic problems and conducting geographic analysis. They will also be able to use multiple methods to examine, represent, and visualize Earth and its geographic characteristics.

## Undergraduate Major

In addition to course work required by the university and the college, majors must complete 40 hours of department requirements, all of which must be completed with a grade of C or above. Note: students not pursuing one of the five existing concentrations but who accumulate 15 or more of their 26 content credits in Physical Geography and Geographic Information Science qualify for the B.S. degree. Those accumulating 15 or more of their 26 content credits in Natural Resource Management and Human Geography qualify for either a B.S. or a B.A. degree. Students must declare to their academic adviser their preference of degrees prior to graduation. Students in both the B.A. and B.S. programs must complete the following:

**Core requirements: 14 hours**  
 GEOG 1000 World Regional Geog.....3  
 GEOG 1010 Intro to Physical Geography ...4  
 GEOG 1020 Intro to Human Geog.....3  
 GEOG 2150 Found of GIS & Tech.....4

**Content areas.** 26 hours distributed among a minimum of three of the following areas with at least two courses in each of two areas:

- Human geography
- Physical geography
- Geographic information science
- Natural resource management

Courses which satisfy content area requirements are identified by the following codes which appear at the end of the course descriptions: (H) human geography, (P) physical geography, (A) geographic information science, (R) natural resource management. Courses used to meet department requirements must be approved by the faculty adviser. The remaining credit hours needed for completion of the B.A. or B.S. are elective credits (approximately 13-15).

**Undergraduate Concentrations**

Although students are encouraged to sample from the wide variety of courses within the geography program, and the general geography major is an option selected by many students, most undergraduate majors choose to specialize in one of the department’s areas of concentration. Students must maintain a 3.0 GPA in concentration area courses.

**Concentration in Physical Geography (B.S.).** Offerings in this concentration include an introductory survey of the natural environment and advanced course work in areas that include landforms, soils, weather and climate, glacial and periglacial environments, paleoenvironments, and biogeography. Course work in this concentration is frequently related to ongoing faculty research programs and activities. Courses in this concentration are designated with (P) in the following course listing. The concentration consists of 16 hours to include:  
 GEOG 1010 Intro to Phys Geog .....4  
*and any four of the following courses*

GEOG 3010 Geomorphology .....3  
 GEOG 3450 Weather/Climate .....3  
 GEOG 3480 Environmental Change .....3  
 GEOG 3550 Natural Hazards & Society.....3  
 GEOG 4000 Terrain Analysis .....3  
 GEOG 4450 Fluvial Geomorphology .....4  
 GEOG 4460 Biogeography .....3  
 GEOG 4470 Fire Ecology.....3

**Concentration in Geographic Information Science (B.S.).** The concentration in geographic analysis focuses upon the interface between geography and the computer. It offers special-

ized training in a variety of analytic tools and methods courses ranging from the design and preparation of maps using computer-aided mapping programs to the spatial analysis of physical and human phenomena using detailed computer-based geographic-based geographic information systems (GIS). Courses in this concentration are designated with an (A) in the following course listing. The concentration consists of 19 hours to include:

GEOG 2150 Found of GIS & Tech.....4  
 GEOG 4200 Intro to GIS .....4

*And at least 12 credits from among the remaining courses.*

GEOG 4000 Terrain Analysis .....3  
 GEOG 4111 Remote Sensing of Env .....4  
 GEOG 4113 Geol. Remote Sensing .....4  
 GEOG 4150 Cartography & Dig Map Des..4  
 GEOG 4210 Advanced GIS.....4  
 GEOG 4211 Adv Remote Sensing of Env ...4  
 GEOG 4220 Spatial Modeling/Geocomp ...4  
 GEOG 4240 GISC for Bus. & Ind. ....3  
 GEOG 4280 Quant Methods .....4

**Concentration in Natural Resource Management (B.A.)** Interdisciplinary approach to the management of natural and recreational resources, with emphasis on the Rocky Mountain region. Resource management is a major focus of departmental faculty and encompasses an array of topics, including physical and social aspects of natural resource management, management of fire in natural systems, public land management, hazard studies, the planning-managing-administration of recreation and tourism resources, and the geographic analysis of resource systems. Courses in this concentration are designated as (R) in the course listing. The concentration consists of 15 hours to include:

GEOG 4040 Conservation of Natural Resources .....3

*and any four of the following courses*

GEOG 1050 Intro to Env. & Nat. Res. ....3  
 GEOG 2550 Recreation Nat Resources.....3  
 GEOG 3400 Traditional Ecol. Knowledge .3  
 GEOG 3550 Natural Hazards & Society.....3  
 GEOG 4000 Terrain Analysis .....3  
 GEOG 4051 Env Politics .....3  
 GEOG 4052 Fed Land Politics .....3  
 GEOG 4080 Mgmt. Maj. River Basins.....3  
 GEOG 4111 Remote Sensing of Env .....4  
 GEOG 4211 Adv Remote Sensing of Env ...4  
 GEOG 4310 Found of Sustainable Plan .....3  
 GEOG 4340 Nat Resource Mgt on Western Reservations .....3  
 GEOG 4370 Environmental Planning .....3  
 GEOG 4400 Nat Resource Policy .....3  
 GEOG 4420 Geography & Tourism .....3  
 GEOG 4460 Biogeography .....3

GEOG 4470 Fire Ecology .....3  
 GEOG 4750 Public Land Mgmt. ....3

**Concentration in Human Geography (B.A.).** The human geography concentration examines how societies organize their economic, cultural, and political activities spatially, and how human societies interact with their environments. Courses in the concentration are directed toward economic, cultural, regional, and global studies. Students in this concentration typically take a variety of courses from related fields such as sociology, political science, economics, international studies, and American studies. Courses within this concentration are designated with (H) in the course listing. The concentration consists of 15 hours to include:

GEOG 1000 World Reg Geog.....3  
 GEOG 1020 Intro to Human Geog.....3

*and any three of the following courses*

GEOG 2200 Geography of Wyoming .....3  
 GEOG 2370 Chicano History .....3  
 GEOG 3030 Geog Development .....3  
 GEOG 3050 Econ Geography .....3  
 GEOG 3550 Natural Hazards & Society.....3  
 GEOG 4013 Political Geography .....3  
 GEOG 4050 Interm Econ Geography .....3  
 GEOG 4310 Found of Sustainable Plan .....3  
 GEOG 4325 Legal Aspect of Planning .....3  
 GEOG 4330 Land Use Planning.....3  
 GEOG 4390 Rural/Small Town Planning ...3  
 GEOG 4420 Geography and Tourism.....3  
 GEOG 4500 The American Landscape.....3  
 GEOG 4502 Images of Wyoming & the West.....3

GEOG 4540 Cultural Ecology .....3  
 GEOG 4550 Geography of Wine.....3  
 GEOG 4560 Global Cities .....3  
 GEOG 4570 Cultural Geography.....3  
 GEOG 4572 Experience of Place.....3  
 GEOG 4574 Contested Landscapes.....3  
 GEOG 4576 Historical Landscapes.....3

**Concentration in Planning (B.S.).** The concentration in planning offers students a pre-professional curriculum; many students in this concentration go on to complete a graduate degree in the department’s graduate planning program. The planning specialty examines the environmental, social and economic factors that influence community and regional change. The program is designed to integrate community visions with current conditions to determine options for the future. The emphasis of the planning concentration is on natural resource and rural community planning, approached from an interdisciplinary perspective. Courses within this concentration are designated with (PL) in the course listing. The concentration consists of 15 hours to include:

GEOG 4310 Found of Sustainable Planning .....3  
 GEOG 4330 Land Use Planning.....3  
*and any three of the following courses*  
 GEOG 4325 Legal Aspects of Planning.....3  
 GEOG 4340 Natural Res. Mgmt on Western Reservations.....3  
 GEOG 4370 Environmental Planning .....3  
 GEOG 4390 Rural/Small Town Plan.....3  
 GEOG 4400 Natural Resource Policy.....3  
 GEOG 4750 Pub Land Mgt.....3

**Undergraduate Minor**

The department offers minors in geography, planning, and geographic information sciences. Credit requirements range from 18-20 hours of required and elective courses, all of which must be completed with a grade of C or above. Information on the minor programs is available on the geography department website.

**Environment and Natural Resources**

The department offers a concentration in the university’s interdisciplinary program, Environment and Natural Resources. A description of the concentration requirements is available online at the ENR website.

**Graduate Study**

The Department of Geography offers programs leading to the Master of Arts, Master of Science in teaching, and Master of Planning degrees. Areas include: physical geography, natural resource management, spatial analysis, information, and display, and human geography. Areas in planning include: land use planning, natural resource planning, economic development natural resource planning, community and regional planning, and site development.

**Program Specific Admission Requirements**

In addition to the minimum requirements set forth in this *Catalog*, applicants must submit a statement of academic and professional goals. All applicants are evaluated on an individual basis. Undergraduate deficiencies, identified by the candidate and adviser, can be remedied during the degree program.

**Program Specific Graduate Assistantships**

Graduate assistantships are available as both teaching and research assistantships. Applicants for graduate assistantships must submit their completed materials to the graduate coordinator of the department by February 1st prior to the fall semester for which they are seeking the assistantship. Students already in the program as well as new applicants for admission may apply for graduate assistantships. Assistantship duties will be determined following the award and acceptance of the student.

**Program Specific Degree Requirements**

Incoming students must have a minimum undergraduate background equivalent to 15 semester hours in college-level geography courses to include 3 hours each in maps and mapping, human geography, and physical geography. Planning students may use undergraduate course work in planning, analytic tools, regional science, or other relevant subject matter to meet the undergraduate requirement. Deficiency courses prescribed by the faculty adviser do not count toward graduate program requirements, and must be taken for credit and for a grade (not S/U).

**All Master Degrees (Plan A Thesis)**

Thirty credit hours of approved course work (not including thesis research), a minimum of six hours of thesis research, and completion of a thesis.

**Core Requirements - All Programs:**

GEOG 5000 Research Perspectives .....3  
 Students will successfully complete at least two techniques courses totaling six or more credit hours. These may be selected from the list below. Alternatively, students may discuss with their advisor techniques courses that more appropriately support their program of study and research plans.  
 GEOG 4200 Introduction to Geographic Information Sciences .....4  
 GEOG 5001 Research in Geography Colloquium .....2  
 GEOG 5002 Geography Graduate Seminar .....1  
 GEOG 5111 Remote Sensing of the Environment/Lab .....4  
 GEOG 5210 Advanced Geographic Information Systems .....4  
 GEOG 5220 Spatial Modeling .....4  
 GEOG 5455 Remote Sensing of Rivers.....3  
 GEOG 5050 Data Management.....2  
 STAT 5070 Statistical Methods for the Social Sciences .....3

STAT 5210 Statistical Methods.....3  
 AMST 5800 Historical Preservation.....3  
 SOC 5100 Advanced Social Research Methods .....3  
 GEOL 5430 Applied Geostatistics .....3  
 GEOL 5446 Introduction to Geostatistics ..3

All students must complete a thesis which shall be an original contribution to knowledge. All students must prepare a thesis proposal for submission to their committee and have committee approval to initiate research on their thesis and must successfully complete an oral defense of their thesis. The student’s committee may also require a written examination.

**Master of Arts in Geography**

Students must fulfill all requirements listed above.

**Master of Science in Teaching**

Students must fulfill all requirements above, plus requirements developed in conjunction with faculty advisor in the College of Education, not to be less than 12 credit hours of courses in education and/or geography education.

**Master of Planning**

Core courses (12 hours)  
 GEOG 4310 Foundations of Sustainable Planning .....3  
 POLS 5510 Public Policy and Program Management .....3  
 GEOG 5325 Legal Aspects of Planning.....3  
 GEOG 5330 Land Use Planning .....3  
 Analysis courses: (three courses - 9 hours)  
 Statistics: (one course - 3 hours)  
 Techniques: (two courses - 6 hours)

Students completing the Plan A option are required to complete a minimum of 6 hours of thesis research.

Students completing the Plan B are required to complete a minimum of 6 hours of geographic research writing and two papers from the areas of planning: land use, natural resource, or small town and rural area.

Elective courses:  
 15 hours of elective course work in planning areas: land use, natural resource, or small town and rural area approved by faculty adviser.

**Master of Arts in Geography/Water Resources**

**Core Requirements:**  
 GEOG 5000 Research Perspectives .....3  
 GEOG 5450 Fluvial Geomorphology.....4  
 REWM 4700 Wildland Watershed Management .....3  
 OR  
 REWM 4285 Wildland Hydrology.....3

In completing core methods requirements students may also choose GEOG 5111, Remote Sensing of the Environment (4), or GEOG 4455/5455, Remote Sensing of Rivers (3). Additional course requirements include one class from the Technical Hydrology and/or Water Quality lists for the Interdisciplinary MS Program in Hydrology & Water Resources (WARE) program and one course from the Law and Natural Resource Economics list.

*Technical Hydrology Water Quality Course Requirement (at least one of the following):*

CE 4800 Hydrology .....3  
 CE 5435 Environmental Transport Processes .....3  
 CE 5445 Hazardous Waste Site Remediation .....3  
 CE 5810 Ground Water Hydrology.....3  
 CE 5860 Soil Erosion and Conservation .....3  
 CE 5870 Water Resources Engineering .....3  
 CE 5880 Advanced Hydrology .....3  
 GEOL 5444 Geohydrology .....3  
 GEOL 5550 Numerical Methods in Ground Water Geology I.....3  
 GEOL 5570 Advanced Geohydrology .....3  
 REWM 4700 Wildland Watershed Management.....3  
 REWM 5280 Stream Habitat Management..3  
 REWM 5285 Wildland Hydrology.....3  
 SOIL/MATH 5110 Modeling Flow Transport in Soil and Groundwater Systems .....4  
 BOT 5740 Ecosystems Analysis .....4  
 CE 4410 Environmental Engineering Chemistry .....3  
 CE 4400 Design of Water Treatment Facilities .....3  
 CE 5410 Advanced Biological Wastewater Treatment .....3  
 CE 5450 Advanced Physical/Chemical Water Treatment Processes .....3  
 GEOL 4490 Geochemistry .....3  
 GEOL 5450 Water Quality Modeling .....3  
 GEOL 5777 Geochemistry of Natural Waters .....3  
 REWM 5710 Watershed Water Quality Management.....3  
 SOIL 5130 Chemistry of the Soil Environment.....4  
 ZOO 4440 Limnology .....3  
*Law and Natural Resource Economics Course Requirement (at least one of the following):*  
 AGECE 4710 Natural Resource Law and Policy .....3  
 AGECE 4720 Water Resource Economics.....3  
 AGECE 5630 Advanced Natural Resources Economics .....3  
 ECON 4400 Environmental Economics .....3  
 ECON 4410 Natural Resources Economics .....3

ECON 5400 Advanced Resource & Environmental Economics.....3  
 LAW 6660 Environmental Law.....3  
 LAW 6860 Water Rights.....3

**Plan B (Non-Thesis)**

Thirty credit hours of approved course work (not including geographic research writing credit), a minimum of six hours of research writing credit, and the completion of two professional research papers.

**Core Requirements - All Programs:**

GEOG 5000 Research Perspectives .....3  
 Students will successfully complete at least two techniques courses totaling six or more credit hours. These may be selected from the list below. Alternatively, student may discuss with their advisor techniques courses that more appropriately support their program of study and research plans.  
 GEOG 4200 Introduction to Geographic Information Systems .....3  
 GEOG 5001 Research in Geography Colloquium .....2  
 GEOG 5002 Geography Graduate Seminar .....1  
 GEOG 5111 Remote Sensing of the Environment/Lab.....4  
 GEOG 5210 Advanced Geographic Information Systems .....4  
 GEOG 5220 Spatial Modeling .....4  
 GEOG 5455 Remote Sensing of Rivers.....3  
 GEOG 5050 Data Management.....2  
 STAT 5070 Statistical Methods for the Social Sciences .....3  
 STAT 5210 Statistical Methods.....3  
 AMST 5800 Historical Preservation.....3  
 SOC 5100 Advanced Social Research Methods .....3  
 GEOL 5430 Applied Geostatistics .....3  
 GEOL 5446 Introduction to Geostatistics ..3

All students must have committee approval to initiate research on their professional papers and must successfully complete an oral defense of their professional papers. The student's committee may also require a written examination.

**Geography (GEOG)**

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).**

**1000 [G&R 1000]. World Regional Geography. 3. [CS,G◀▶H]** Covers the distributions, traits, and processes of the Earth's peoples and landscapes through the perspective of regional geography, which is the study of the spatial relationships of natural environments and

human societies. Equivalent to INST 1060. Credit cannot be earned in both GEOG 1000 and INST 1060.

**1010 [G&R 1010]. Introduction to Physical Geography. 4. [SE◀▶PN]** Systematically studies natural aspects of geographic environments, including weather and climate, landforms, soils and vegetation. Lab fee required. (Offered both semesters)

**1020 [G&R 1020]. Introduction to Human Geography. 3. [CS,G◀▶H]** Analyzes spatial patterns of and interaction between the world's great cultural systems. Includes settlement patterns, behavioral patterns, agricultural land use and resource utilization. (Offered both semesters)

**1050 [G&R 1050]. Introduction to Environment and Natural Resources. 3.** Examines human interaction with environment, ranging from regional to global scales, from perspectives of environmental effects on human life, human effects on environment and approaches to environmental management. (Normally offered spring semester) (R)

**2150 [G&R 2150]. Foundations of Geo Information Science and Technology. 4. [L◀▶(none)]** Overviews the role of geographic information and technology in modern society. Includes discovery and accessing geospatial data and information for both research and enjoyment, with an emphasis on reading and analyzing maps and visualizations to support geographical reasoning. Lab provides hands-on experience working with maps and related geographic information technologies. (Normally offered spring semester) (A)

**2200. [G&R 2200] Geography of Wyoming and the West. 3.** Covers the distributions, traits, and processes of Wyoming's people and landscapes, and their context in the West, through the perspective of regional geography. *Prerequisite:* GEOG 1010 or 1020. (Offered based on sufficient demand and resources) (H)

**2370. Chicano History: Origins to 1900. 3. [CS,D◀▶(none)]** General survey that traces the geographic distribution and historical processes that have shaped the life experiences, socio-economic development and cultural contributions of peoples of Mexican descent in the United States from their indigenous and Hispanic origins to the end of the 19th century. Cross listed with CHST/HIST 2370. (H)

**2550 [G&R 2550]. Recreation and Natural Resources. 3.** Introduces outdoor recreation agencies and programs; supply and demand for outdoor recreation resources; and relationship of recreation to the conservation of natural resources. (Normally offered fall semester) (R)

**3010 [G&R 3010]. Geomorphology of Earth's Dynamic Landscapes. 3.** A Systematic exploration of Earth's surface, emphasizing the geographic distribution of various landforms and their evolution over time. Introduces general geomorphic principles and describes the application of these principles to specific landscape features. The processes that drive landscape change are examined through case studies, computer-based mapping exercises, and basic calculations. *Prerequisites:* QA, QB, and either GEOG 1010 or GEOL 1500. (P)

**3030 [G&R 3030]. Geography and Development. 3. [CS,G◆(none)]** Examines distribution of wealth and poverty in the world; theories of development, from traditional modernization theories through Marxist critiques and sustainable development; and case studies from around the world of development successes and failures, chosen to illustrate and illuminate theories of development. *Prerequisite:* GEOG 1000 or 1020 or 9 credit hours of social science with global focus. (Normally offered fall semester) (H)

**3050 [G&R 3050]. Economic Geography. 3.** Economic Geography is the study of the location, distribution and spatial organization of economic activities across the globe; specifically how the economic realm is intertwined with other spheres of international social life. It explores the inherent logics and mechanisms of the capitalist system, and the social and spatial inequalities that result. *Prerequisite:* 6 hours of Social Sciences or International Studies. (Normally offered fall semester every other year) (H)

**3150. Survey of Remote Sensing Applications. 3.** Provides an introduction to remote sensing with a survey of applications in different fields. It include a brief introduction to fundamental of remote sensing and surveys applications of aerial photography, multi-and hyperspectral, active and thermal remote sensing, and global change remote sensing. Cross listed with BOT 3150. *Prerequisites:* completion of a USP QA course and one science course with laboratory. (A)

**3280. Spatial Methods. 4. [(none)◆COM3]** Introduction of statistical methods for the analysis of geo-spatial data; point, line/network, and areal units. The application of quantitative measurements to examining the spatial relationship of physical and socio-economic factors in problem-solving. *Prerequisites:* at least one geography course and completion of either STAT 2010, 2050, or 2070. (A)

**3400. Traditional Ecological Knowledge. 3. [CS,D◆(none)]** Description of the interaction between economy, religion, language and the ecosystem for select indigenous peoples

and discussion of the pedagogical methods for preserving their ecological knowledge. An examination of the conflict between contemporary society's demands and preserving traditional society's heritage. Cross listed with AIST 3400. *Prerequisite:* one course in American Indian culture. (R)

**3450 [G&R 3450]. Weather and Climate. 3.** Systematically examines elements and controls of weather and climate with application to regions. Cross listed with ENR 3450. *Prerequisite:* GEOG 1000, 1010 or 1020. (Normally offered fall semester) (P)

**3480 [G&R 3480]. Environmental Change. 3. [WB,G◆(none)]** Examines changes in the bio-physical environments and landscapes of Earth during its habitation by humans. Emphasizes integrated approaches to understanding environmental changes based on climatological, ecological, geological, archeological, and historical evidence. Explores how humans have modified Earth's environments and how societies have responded to natural and anthropogenic environmental change. Cross listed with ESS 3480. *Prerequisites:* GEOG 1010 or any USP S, SB, SE or SP course; any WA course. (P)

**3550 [G&R 3550]. Natural Hazards and Society. 3. [CS◆(none)]** Considers societal structures and processes as they interact with hazards in the natural environment. (Offered based on sufficient demand and resources) (H,P,R)

**4000 [G&R 4000]. Terrain Analysis. 3.** Studies techniques for acquiring and analyzing spatial data from maps, remotely sensed imagery and field surveys for landscape assessment. Emphasizes deriving maps that describe physical suitability of landscapes for specific human activities. Field trip required. *Prerequisites:* GEOG 2150 and junior standing. (P,A,R)

**4013. Political Geography. 3.** Geographic space is subdivided into political units to aid human interaction and to facilitate political processes. Examines the spatial organization of political space and its effects upon political processes at varying geographic scales ranging from the local to international. Dual listed with GEOG 5013; cross listed with POLS 4013. *Prerequisite:* GEOG 1000 or 1020, or 9 hours of social science. (H)

**4040 [G&R 4040]. Conservation of Natural Resources. 3. [CS◆(none)]** Geographically analyzes conservation of natural and human resources, as well as political, social and ethical ramifications of our environmental policy. Cross listed with ENR 4040. *Prerequisite:* 6 hours of geography or ENR. (R)

**4050 [G&R 4050]. Intermediate Economic Geography. 3.** Studies spatial interaction of pertinent physical, economic and social variables as they influence behavior of industrial, agricultural and commercial activities. *Prerequisite:* GEOG 3050. (Offered based on sufficient demand and resources) (H)

**4051 [G&R 4051]. Environmental Politics. 3. [WC◆(none)]** Analyzes environmentalism as a political phenomenon. Provides students with a basic understanding of how to analyze political issues by: (1) examining the historical and contemporary issues that produce controversy over environmental matters; and (2) surveying the impacts of these issues on the formulation and implementation of laws, policies, and regulations. Cross listed with AMST, ENR, POLS and REWM 4051. *Prerequisite:* POLS 1000. (R)

**4052 [G&R 4052]. Federal Land Politics. 3.** Examines the political forces that have shaped and continue to shape federal land policy and management. Explores the interactions between democratic decision making and science in the management of federal lands. Surveys the sources of controversy over federal land management and methods for harmonizing public demands with technical expertise. Cross listed with POLS/ENR/AMST/REWM 4052. *Prerequisite:* POLS 1000. (R)

**4080 [G&R 4080]. Management of Major River Basins. 3.** Examines geography of water resources, including distribution, water as a resource and water as a hazard to humans. Focuses on water management case studies on the scale of major river basins in North America and elsewhere in the world. *Prerequisites:* GEOG 4040 and junior standing. (Offered based on sufficient demand and resources) (R)

**4111. Remote Sensing of the Environment. 4.** Combined lecture and laboratory course introduces students to the fundamentals of remote sensing with a strong emphasis on vegetation, land cover and environmental applications. Students learn to use digital spectral data to distinguish characteristics of the terrestrial biosphere important for ecological and land management applications. Dual listed with GEOG 5111; cross listed with BOT 4111. *Prerequisites:* QA and one science course with lab. (A) (R)

**4113. Geological Remote Sensing. 4.** Acquaints students with aircraft and spacecraft remote sensing of the environment, emphasizing geologic application to earth and other planetary bodies. Includes visible, infrared, ultraviolet, radio and radar sensing. Laboratory exercises are applications related to tectonics, geomorphology, paleoclimate, structure, stratigraphy, environmental geology and geologic

hazards. Dual listed with GEOG 5113; cross listed with GEOL 4113. *Prerequisites:* GEOL 1005 or 1100 or 1200 or GEOG 1010 and MATH 1400/1405 or MATH 1450. (A)

**4150 [G&R 4150]. Cartography and Digital Map Design. 4.** Studies techniques for effectively selecting, analyzing and graphically displaying geographic information. *Prerequisite:* GEOG 2150. (Normally offered spring semester) (A)

**4200 [G&R 4200]. Introduction to Geographic Information Systems. 4.** Fundamental concepts, theories and applications in geographic information systems and science. *Prerequisite:* GEOG 2150. (Normally offered fall semester) (A)

**4210 [G&R 4210]. Advanced Geographic Information Systems. 4.** Advanced study of programs, data structures, and techniques for spatial data display and analysis. Dual listed with GEOG 5210. *Prerequisite:* GEOG 4200. (Normally offered spring semester) (A)

**4211. Advanced Remote Sensing of the Environment. 4.** Includes lecture and laboratory. Specific topics include a review of remote sensing fundamentals and methods for using high spatial resolution data, hyperspectral data, active remote sensing, advanced image processing, advanced classification techniques and statistical techniques specific to exploring remotely sensed data. Cross listed with BOT 4211; dual listed with GEOG 5211. *Prerequisite:* BOT/GEOG/GEOL 4111. (A, R)

**4220. Spatial Modeling and Geocomputation. 4.** Examines the theory and development of models of spatial patterns and process. Modeling these systems often required techniques not readily available in a GIS environment. Examines GIS and geocomputational methods to solve these problems as well as issues related to error, representation, and scale. Dual listed with GEOG 5220. *Prerequisite:* GEOG 4200/4210. (A)

**4240. GIScience for Business and Industry. 3.** Examines a variety of roles that GIScience plays in the modern day business landscape. Through a combination of lectures and hands-on work with some of the same tools employed by industry, students will become acquainted with the roles and applications of GIScience in a business context. Dual listed with GEOG 5240. *Prerequisite:* junior standing; QB. (A)

**4280 [G&R 4280]. Quantitative Methods. 4.** Examines and utilizes mathematical and statistical tools in analyzing geographic and spatial data. Dual listed with GEOG 5280. *Prerequisite:* STAT 2070 or equivalent. (Normally offered spring semester) (A)

**4300 [G&R 4300]. GPS for Natural Resource Management. 3.** Introduction to the basic concepts of global positioning systems, project planning and development, integration into a GIS, and its applications to natural resource management. Dual listed with GEOG 5300. *Prerequisites:* senior status and GEOG 2150. (A)

**4310 [G&R 4310]. Foundations of Sustainable Planning. 3.** Description and analysis of planning that involves a citizen involvement process to determine the future direction of a community or region. Sustainability concepts are described to provide a framework for social equity, environmental protection, and economic longevity, the fundamental elements of a community or regional comprehensive plan. Dual listed with GEOG 5310. *Prerequisite:* junior standing. (Normally offered fall semester) (H,R, PL)

**4325 [G&R 4325]. Legal Aspects of Planning. 3.** Review of the U.S. Constitution, federal and state laws and statutes, and pertinent court cases that directly relate to planning policy at the federal, state and local level. Examination of the legal system to provide services and protect the health, safety, and welfare of citizens with regard to private property rights. *Prerequisites:* junior standing, USP "V" course. (PL) (H)

**4330 [G&R 4330]. Land Use Planning. 3.** Advanced study of processes expressed as a specific activity on the land. An examination and analysis of the interacting environmental, economic, and social factors that produce the land activity. Dual listed with GEOG 5330. (PL) (H)

**4340 [G&R 4340]. Natural Resource Management on Western Reservations. 3.** Designed to examine natural resource management techniques on western reservations. Topics to be discussed will focus on the management and planning of water, grazing, extractive industries and forestry. Field work on the Wind River Indian Reservation is a part of the class. Cross listed with AIST 4340. *Prerequisite:* 6 hours of 2000-level AIST classes. (PL) (H)

**4370 [G&R 4370]. Environmental Planning. 3.** A planning-oriented approach to ecosystems theory based on the federal/legal regulatory foundation. An examination of scientific and alternative perspectives on the comparative dynamics of natural and human-oriented ecosystems and implementing strategies. Dual listed with GEOG 5370. (PL, R)

**4390 [G&R 4390]. Rural & Small Town Planning. 3.** A single community planning problem is assigned. Student teams play the role of community planning staff. Teams

experience defining community goals; communicating with others about these goals and problem perceptions; accomplishing necessary research; generating various solutions to problems they have perceived; selected from among these solutions, and formulating a single, integrated, comprehensive plan and documenting the plan and rationale behind it. Dual listed with GEOG 5390. *Prerequisite:* work at the 4000-level in one or more of the four substantive areas, and/or consent of the instructor. (PL) (H)

**4400 [G&R 4400]. Natural Resource Policy. 3.** Encompasses administrative policies and programs relating to natural areas. Emphasizes the national park system. *Prerequisite:* GEOG 4750. (Offered fall semester of odd-numbered years) (R, PL)

**4420 [G&R 4420]. Geography and Tourism. 3.** Studies concepts, methods, conflicts and opportunities of national and international tourism. Emphasizes recreation and the environment. *Prerequisites:* GEOG 1000. (Normally offered spring semester) (H)

**4450 [G&R 4450]. Fluvial Geomorphology. 4.** A systematic examination of rivers and related land forms. Emphasizes understanding how processes of flow and sediment transport influence channel form and behavior. Considers rivers systems across a range of scales, from movement of individual sediment particles to organization of continental drainage basins. Explores connections to aquatic ecosystems and human impacts. Dual listed with GEOG 5450. *Prerequisites:* GEOG 3010 or GEOL 2100 or 2150. (P)

**4455. Remote Sensing of Rivers. 4.** Explores the application of remote sensing data and techniques to the study of river systems and introduces the physical principles that enable various channel attributes to be inferred from different types of image data. A series of computer-based exercises illustrate methods for characterizing river form and behavior via remote sensing. Dual listed with GEOG 5455. *Prerequisites:* junior standing and one prior course in remote sensing.

**4460 [G&R 4460, 3460]. Biogeography. 3.** A systematic study of the distribution of plants and animals, communities and ecosystems, the processes that produce patterns of distribution and their change over time. Interactions of climate, soil geomorphology, biota and human activities are emphasized. *Prerequisites:* junior standing and GEOG 1010 or LIFE 2022 or 2023. (P, R)

**4470 [G&R 4470]. Fire Ecology. 3.** Natural and human-caused fires are an important phenomenon affecting ecosystems and human communities throughout the world. Explores

the geography, ecology, and management of fires. Dual listed with GEOG 5470. *Prerequisite:* GEOG 4460, BOT 4700, LIFE 3400 or graduate standing. (P, R)

**4500 [G&R 4500]. The American Landscape. 3.** Provides a basis for interpreting the nature and content of the contemporary landscapes of the United States by viewing those landscapes in the process of creation and change and investigates the relationship between landscape and American environmental attitudes. Students are introduced to research techniques and methodologies in historical geography. *Prerequisite:* GEOG 1010 or 1020, or 6 hours in social science. (H)

**4502. Images of Wyoming and the West. 3.** The West is nothing more than a barren, desolate landscape to some while to others it offers great spiritual and cultural significance. Examines how individuals and groups perceive Wyoming and the West, how such perceptions have been constructed over time, and how these differing views create images of the region both real and imagined. Dual listed with GEOG 5502. *Prerequisite:* GEOG 1000 or GEOG 1020 and junior standing. (H)

**4540 [G&R 4540]. Topics in Cultural Ecology:\_\_\_\_\_ 3 (Max. 6). [WC◀(none)]** Examines selected topics of human-environment interaction from a cultural ecological perspective. May be repeated for a maximum of 6 credits under different course topics. Dual listed with GEOG 5540. *Prerequisites:* junior standing and 4 hours biological or earth science and 6 hours social science. (H)

**4550. Geography of Wine. 3.** Examine the regional influence of climate, terrain and cultural characteristics on the production of grape varieties and demonstrate the implications of this influence on the location and distribution of wines produced. Discussion will focus on the world-wide production and consumption of wine and impacts of multi-national corporations. *Prerequisites:* junior standing and at least 21 years of age. (H)

**4560. Global Cities. 3.** Globalization accelerates urbanization processes and creates a new type of city, the global city. This course introduces debates over global cities, urban culture, new urban landscapes, urban planning practices, and social disparity. It uses case studies on the cities around the world to explore the diversity of global city formation processes. Dual Listed with GEOG 5560; cross listed with INST 4560. *Prerequisites:* 9 hours of international studies or geography.

**4570. Cultural Geography. 3.** Cultural Geography is an overview in qualitative cultural landscape studies. The course emphasizes what a cultural landscape is, how it can be

examined, and what can be learned from such landscapes. Students are exposed to readings in cultural geography from a wide array of viewpoints with an emphasis placed on classic works. Dual listed with GEOG 5570. *Prerequisite:* GEOG 1000 or GEOG 1020 and junior standing. (H)

**4572. Experience of Place. 3.** Examines how individuals and groups perceive specific geographic locations, how such perceptions are constructed, and how these differing views and feelings play out in our everyday. Dual listed with GEOG 5572. *Prerequisites:* GEOG 1000 or GEOG 1020. (H)

**4574. Contested Landscapes. 3.** Explores the representation of place and how various groups often have differing views of how a place should be represented and/or thought of. Various local representations of contested land use, group place identity, and personal place identity are discussed. Dual listed with GEOG 5574. *Prerequisite:* GEOG 1000 or GEOG 1020 and junior standing. (H)

**4576. Historical Landscapes. 3.** A cultural landscape expresses much of who we are. Students examine how one can learn from the past as well as more accurately assess our present culture by examining the layers of culture offered on the landscape. Dual listed with GEOG 5576. *Prerequisite:* GEOG 1000 or GEOG 1020 and junior standing. (H)

**4750 [G&R 4750, 4700]. Public Land Management. 3.** Teaches management of the federal and public lands of the United States. Includes consideration of management issues, agencies and organizations, and management approaches for public lands and associated natural resources. Dual listed with GEOG 5750. *Prerequisite:* 6 hours of geography or ENR. (Offered once a year) (R, PL)

**4860 [G&R 4860]. Field Studies. 1-6 (Max. 6).** Intensive introduction to field methods used in geographic research in one or more of the subdivisions of geography. Dual listed with GEOG 5860.

**4865 [G&R 4865]. Directed Studies/Research Problems. 1-6 (Max 6).** Intensive introduction to methods used in geographic research. Dual listed with GEOG 5865. *Prerequisites:* consent of instructor and at least 12 hours in geography.

**4870 [4990]. Practicum. 1-6 (Max. 12).** Experience in applying student skills and training in an agency, organization, or business. Offered for S/U only. Dual listed with GEOG 5870. *Prerequisites:* for majors only, minimum of 12 hours in the major, junior standing and consent of the instructor. (Offered fall, spring and summer)

**4875 [G&R 4875, 4950]. Independent Studies. 1-6 (Max. 6).** Considers current research topics in consultation with faculty member. Dual listed with GEOG 5875. *Prerequisite:* 9 hours in subject area of topic of current research. (Offered fall, spring and summer)

**4880 [G&R 4880, 4850]. Current Topics. 1-6 (Max. 9).** Special course on a topic of current interest. Dual listed with GEOG 5880. *Prerequisite:* junior standing. (Offered fall, spring and summer)

**4885 [G&R 4885, 4900]. Seminar: \_\_\_\_\_ 1-3 (Max. 6).** Faculty-student discussion, reading, and study focused on a selected topic and interest. Dual listed with GEOG 5885. *Prerequisite:* GEOG 4750. (Offered based on sufficient demand and resources)

**5000. Research Perspectives. 3.** Focuses upon the historical development, heritage and topical breadth of geography. Special emphasis is given to the changing approaches and philosophies for conducting research in geography. *Prerequisite:* graduate student admitted to our program, or, any other student with 15 hours of geography courses.

**5001. Research in Geography Colloquium. 2.** Colloquium series and discussion to review and critique examples of current research in geography and allied disciplines. This course builds on the theoretical and philosophical foundations from Research Perspectives. *Prerequisite:* GEOG 5000.

**5002. Geography Graduate Seminar. 2.** Research seminar providing third-semester graduate students a public and formal opportunity to present their research. *Prerequisite:* GEOG 5001.

**5013. Political Geography. 3.** Geographic space is subdivided into political units to aid human interaction and to facilitate political processes. Examines the spatial organization of political space and its effects upon political processes at varying geographic scales ranging from the local to international. Cross listed with POLS 5013 and dual listed with GEOG 4013. *Prerequisite:* GEOG 1000 or 1020, or 9 hours of social science.

**5050. Techniques in Environmental Data Management. 4.** Centers on the role of information technology in support of scientific research. Through integration of multiple software packages (e.g. Relational databases, ProgramR and ArcGIS), proven database designs, and SQL scripting, increased efficiency and utility will occur during data analyses. These information science principles are demonstrated using project-based examples. Cross listed with ECOL/ENR 5050. *Prerequisite:* graduate standing.

**5060. Landscape Ecology. 3.** A study of structure, function, and change in the biosphere on the scale of kilometers. Includes a consideration of the effects of human land uses, natural disturbances, and other processes on landscapes. *Prerequisite:* GEOG 4460 or LIFE 3400 or BOT 4700.

**5111. Remote Sensing of the Environment. 4.** Combined lecture and laboratory course introduces students to the fundamentals of remote sensing with a strong emphasis on vegetation, land cover and environmental applications. Students learn to use digital spectral data to distinguish characteristics of the terrestrial biosphere important for ecological and land management applications. Dual listed with GEOG 4111; cross listed with BOT 5111. *Prerequisites:* QA and one science course with lab.

**5113. Geological Remote Sensing. 4.** Acquaints students with aircraft and spacecraft remote sensing of the environment, emphasizing geologic application to earth and other planetary bodies. Includes visible, infrared, ultraviolet, radio and radar sensing. The laboratory exercises are applications related to tectonics, geomorphology, paleoclimate, structure, stratigraphy, environmental geology and geologic hazards. Dual listed with GEOG 4113; cross listed with GEOL 5113. *Prerequisites:* GEOL 1005 or 1100 or 1200 or GEOG 1010 and MATH 1400/1405 or MATH 1450.

**5210. Advanced Geographic Information Systems. 4.** Advanced study of programs, data structures, and techniques for spatial data display and analysis. Dual listed with GEOG 4210. *Prerequisite:* GEOG 4200.

**5211. Advanced Remote Sensing of the Environment. 4.** Includes lecture and laboratory. Specific topics include a review of remote sensing fundamentals and methods for using high spatial resolution data, hyperspectral data, active remote sensing, advanced image processing, advanced classification techniques and statistical techniques specific to exploring remotely sensed data. Dual listed with GEOG 4211; cross listed with BOT 5211. *Prerequisite:* BOT/GEOG/GEOL 4111/5111.

**5220. Spatial Modeling and Geocomputation. 4.** Examines the theory and development of models of spatial patterns and process. Modeling these systems often requires techniques not readily available in GIS environment. Examines GIS and geocomputational methods to solve these problems as well as issues related to error, representation, and scale. Dual listed with GEOG 4220. *Prerequisite:* GEOG 4200/4210.

**5240. GIScience for Business and Industry. 3.** Examines a variety of roles that GIScience plays in the modern day business landscape. Through a combination of lectures and hands-on work with some of the same tools employed by industry, students become acquainted with the roles and applications of GIScience in a business context. Dual listed with GEOG 4240. *Prerequisites:* junior standing, QB.

**5300. GPS for Natural Resource Management. 3.** Introduction to the basic concepts of the global positioning system, project planning and development, integration into a GIS, and its applications to natural resource management. Dual listed with GEOG 4300. *Prerequisite:* senior or graduate status and GEOG 2150.

**5310. Foundations of Sustainable Planning. 3.** Description and analysis of planning that involves a citizen involvement process to determine the future direction of a community or region. Sustainability concepts are described to provide a framework for social equity, environmental protection, and economic longevity, the fundamental elements of a community or regional comprehensive plan. *Prerequisite:* junior standing.

**5325. Legal Aspects of Planning. 3.** Review of the U.S. Constitution, federal and state laws and statutes, and pertinent court cases that directly relate to planning policy at the federal, state and local level. Examination of the legal system to provide services and protect the health, safety, and welfare of citizens with regard to private property rights. Dual listed with GEOG 4325. *Prerequisites:* junior standing, USP V course.

**5330. Land Use Planning. 3.** Advanced study of processes expressed as a specific activity on the land. An examination and analysis of the interacting environmental, economic, and social factors that produce the land activity. Dual listed with GEOG 4330. *Prerequisite:* graduate standing in GEOG.

**5370. Environmental Planning. 3.** A planning-oriented approach to ecosystems theory based on the federal/legal regulatory foundation. An examination of scientific and alternative perspectives on the comparative dynamics of natural and human-oriented ecosystems and implementing strategies. Dual listed with GEOG 4370. *Prerequisite:* GEOG 4330/5330.

**5390. Rural and Small Town Planning. 3.** A single community planning problem is assigned. Student teams play the role of community planning staff. Teams experience defining community goals; communicating with others about these goals and problem perceptions; accomplishing necessary research; perceived; selecting from among these solutions, and formulating a single, integrated, comprehensive

plan, and documenting the plan and rationale behind it. Dual listed with GEOG 4390. *Prerequisite:* work at the 4000-level in one or more of the four substantive areas, and/or consent of the instructor.

**5450. Fluvial Geomorphology. 4.** A systematic examination of rivers and related land forms. Emphasizes understanding how processes of flow and sediment transport influence channel form and behavior. Considers rivers systems across a range of scales, from movement of individual sediment particles to organization of continental drainage basins. Explores connections to aquatic ecosystems and human impacts. Dual listed with GEOG 4450.

**5455. Remote Sensing of Rivers. 4.** Explores the application of remote sensing data and techniques to the study of river systems and introduces the physical principles that enable various channel attributes to be inferred from different types of image data. A series of computer-based exercises illustrate methods for characterizing river form and behavior via remote sensing. Dual listed with GEOG 4455. *Prerequisites:* junior standing and one prior course in remote sensing.

**5470. Fire Ecology. 3.** Natural and human-caused fires are an important phenomenon affecting ecosystems and human communities throughout the world. Explores the geography, ecology, and management of fires. Dual listed with GEOG 4470. *Prerequisite:* GEOG 4460, BOT 4700, LIFE 3400 or graduate standing.

**5502. Images of Wyoming and the West. 3.** The West is nothing more than a barren, desolate landscape to some while to others it offers great spiritual and cultural significance. Examines how individuals and groups perceive Wyoming and the West, how such perceptions have been constructed over time, and how these differing views create images of the region both real and imagined. Dual listed with GEOG 4502. *Prerequisite:* GEOG 1000 or GEOG 1020 and junior standing.

**5540. Topics in Cultural Ecology. 3 (Max. 6).** Examination of a selected topic of human-environment interaction from a cultural ecological perspective. May be repeated for a maximum of 6 credits under a different course topic. Dual listed with GEOG 4540. *Prerequisites:* junior standing and 4 credits of biological or earth science and 6 credits of social science.

**5560. Global Cities. 3.** Globalization accelerates urbanization processes and creates a new type of city, the global city. This course introduces debates over global cities, urban culture, new urban landscapes, urban planning practices, and social disparity. It uses case studies on the cities around the world to



explore the diversity of global city formation processes. Dual Listed with GEOG 4560; cross listed with INST 5560. *Prerequisites:* 9 hours of international studies or geography.

**5570. Cultural Geography. 3.** Cultural Geography is an overview in qualitative cultural landscape studies. The course emphasizes what a cultural landscape is, how it can be examined, and what can be learned from such landscapes. Students are exposed to readings in cultural geography from a wide array of viewpoints with an emphasis placed on classic works. Dual listed with GEOG 4570. *Prerequisite:* GEOG 1000 or GEOG 1020 and junior standing.

**5572. Experience of Place. 3.** Examines how individuals and groups perceive specific geographic locations, how such perceptions are constructed, and how these differing views and feelings play out in our everyday. Dual listed with GEOG 4572. *Prerequisites:* GEOG 1000 or GEOG 1020.

**5574. Contested Landscapes. 3.** Explores the representation of place and how various groups often have differing views of how a place should be represented and/or thought of. Various local representations of contested land use, group place identity, and personal place identity are discussed. Dual listed with GEOG 4574. *Prerequisite:* GEOG 1000 or GEOG 1020 and junior standing.

**5576. Historical Landscapes. 3.** A cultural landscape expresses much of who we are. Students examine how one can learn from the past as well as more accurately assess our present culture by examining the layers of culture offered on the landscape. Dual listed with GEOG 4576. *Prerequisite:* GEOG 1000 or GEOG 1020 and junior standing.

**5750. Public Land Management. 3.** Management of the federal and public lands of the United States. Includes consideration of management issues, agencies and organization, and management approaches for public lands and associated natural resources. Dual listed with GEOG 4750. *Prerequisite:* 6 hours in geography or ENR.

**5790. Research Methods. 1-3 (Max. 9).** Introduction to the methodology of empirical research in related fields for advanced students. *Prerequisites:* 12 hours in the major and consent of instructor.

**5870. Internship/Practicum. 1-12 (Max. 12).** Experience in applying student skills and training in an agency, organization, or business. Dual listed with GEOG 4870. *Prerequisite:* for majors only, junior standing.

**5875. Independent Study. 1-6 (Max. 6).** Considers current research topics in consultation with faculty member. Dual listed with GEOG 4875. *Prerequisite:* 9 hours in subject area of topic of current research.

**5880. Current Topics. 1-9 (Max. 9).** Special course on a topic of current interest. Dual listed with GEOG 4880. *Prerequisite:* junior standing.

**5885. Seminar. 1-3 (Max. 6).** Faculty-student discussion, reading, and study focused on a selected topic of interest. *Prerequisite:* consent of instructor.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: Credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrollment in a graduate degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Geology and Geophysics

122 Geology Building, 766-3386

FAX: (307) 766-6679

Web site: <http://geology.uwyo.edu>

Department Head: Paul L. Heller

### Professors:

**CARRICK M. EGGLESTON**, A.B. Dartmouth College 1983; Ph.D. Stanford University 1991; Professor of Geology 2006, 1995.

**B. RONALD FROST**, B.A. University of Virginia 1969; M.S. University of Washington 1971; Ph.D. 1973; Professor of Geology 1989, 1978.

**CAROL D. FROST**, A.B. Dartmouth College 1979; Ph.D. Cambridge University 1984; Professor of Geology 1995, 1983.

**PAUL L. HELLER**, B.S. State University of New York 1974; M.S. Western Washington University 1978; Ph.D. University of Arizona 1983; Professor of Geology 1994, 1983.

**W. STEVEN HOLBROOK**, B.S. Pennsylvania State University 1982; M.S. Stanford University 1985; Ph.D. 1989; Professor of Geophysics 2003, 1997.

**NEIL F. HUMPHREY**, B.S. University of British Columbia 1978; M.S. University of Washington 1983; Ph.D. 1987; Professor of Geology 2002, 1990.

**BARBARA E. JOHN**, B.A. University of California-Berkeley 1978; Ph.D. University of California-Santa Barbara 1987; Professor of Geology 2002, 1992.

**SUBHASHIS MALLICK**, B.S. Indian Institute of Technology 1976; M.S. 1978; Ph.D. University of Hawaii 1987; Professor of Geology and Geophysics and the School of Energy Resources 2008.

**JAMES D. MYERS**, B.S. University of Rhode Island 1973; M.A. The Johns Hopkins University 1977; Ph.D. 1979; Professor of Geology 1993, 1981.

**KENNETH W. W. SIMS**, B.A. Colorado College 1986; M.S. University of New Mexico 1989; Ph.D. University of California - Berkeley 1995; Professor of Geology 2014, 2009.

**ARTHUR W. SNOKE**, A.B. Franklin and Marshall College 1967; Ph.D. Stanford University 1972; Professor of Geology 1984.

### Associate Professors:

**MICHAEL J. CHEADLE**, B.A. Oxford University 1981; M.S. Cornell University 1984; Ph.D. Cambridge University 1989; Associate Professor of Geology and Geophysics 2001.

**PO CHEN**, B.S. Beijing University 2000; Ph.D. University of Southern California 2005; Associate Professor of Geology and Geophysics and the School of Energy Resources 2014, 2008.

**MARK T. CLEMENTZ**, B.S. University of Missouri, Columbia 1996; Ph.D. University of California, Santa Cruz 2002; Associate Professor of Geology 2011, 2005.

**KENNETH G. DUEKER**, B.A. Whitman College 1984; Ph.D. University of Oregon 1994; Associate Professor of Geophysics 2006, 2000.

**ROBERT R. HOWELL**, B.S. University of Michigan 1974; Ph.D. University of Arizona 1980; Associate Professor of Geology and Geophysics 1992, 1986.

**JOHN KASZUBA**, B.S. Beloit College 1982; M.S. Virginia Polytechnic Institute & State University 1986; Ph.D. Colorado School of Mines 1997; Associate Professor of Geology and the School of Energy Resources 2008, 2012.

**CLIFFORD S. RIEBE**, B.S.E. University of Michigan 1992; Ph.D. University of California-Berkeley 2000; Associate Professor of Geology 2014, 2008.

**BRYAN N SHUMAN**, B.A. Colorado College 1994; M.S. Brown University 1997; Ph.D. 2001; Associate Professor of Geology 2010, 2007.

**YE ZHANG**, B.S. Nanjing University (PR China) 1998; M.S. University of Minnesota 2004; Ph.D. Indiana University 2005; Associate Professor of Geology 2014, 2007.

**Assistant Professor:**

**ELLEN D. CURRANO**, B.Sc. University of Chicago 2003; Ph.D. Pennsylvania State University 2008; Assistant Professor of Geology and Geophysics 2014.

**DARIO GRANA**, B.S. University of Pavia 2003; M.S. 2005; M.S. University of Milano-Bicocca 2006; M.S. Stanford University 2013; Ph.D. 2013; Assistant Professor of Geology and Geophysics and the School of Energy Resources 2013.

**BRANDON McELROY**, B.S. University of Michigan 2000; M.S. 2003; Ph.D. University of Texas 2009; Assistant Professor of Geology 2011.

**ANDREW PARSEKIAN**, B.S. Dickinson College 2005; Ph.D. Rutgers University 2011; Assistant Professor of Geology and Geophysics 2013.

**Lecturers:**

**ERIN CAMPBELL-STONE**, B.A. Occidental College 1992; Ph.D. University of Wyoming 1997; Associate Lecturer 2005, 2001.

**RANDI S. MARTINSEN**, B.S. S.U.N.Y. Stony Brook 1971; M.S. Northern Arizona University 1975; Senior Lecturer 1995.

**Research Scientists:**

**BRADLEY CARR**, B.S. University of Wisconsin-Madison 1987; Ph.D. University of Wyoming 1995; Research Scientist 2013.

**KEVIN R. CHAMBERLAIN**, B.A. Colgate University 1979; Ph.D. Washington University 1990; Research Professor 2004, 1990.

**JANET C. DEWEY**, B.S. Mississippi State University 1990; M.S. Auburn University; Assistant Research Scientist 2011.

**SUSAN SWAPP**, B.A. Indiana University 1977; M.S. Yale University 1978; Ph.D. 1982; Senior Research Scientist 1994.

**Adjunct Professors:**

Vladmir Alvarado, Eric Erslev, Warren B. Hamilton, Peter H. Hennings, Ranie Lynds, Laura Vietti

**Professors Emeriti:**

Donald W. Boyd, James I. Drever, William E. Frerichs, Robert Houston, Jason A. Lillegraven, Ronald W. Marrs, James E. McClurg, Brainerd Mears, Jr., Peter Shive, Scott B. Smithson, James R. Steidtmann, Ronald C. Surdam

**G**eology is the study of the origin, history and structure of the earth. Our undergraduate offerings encompass virtually every aspect of the science, with emphasis on current theory, methods and applications. The philosophy of the department is to provide sound training in both theory and field observation, and to couple this background with a thorough education in modern laboratory, quantitative and field techniques required for an understanding of geologic processes.

The setting of the university in the Rocky Mountains is ideal because some of North America's most outstanding geologic features are within a short drive of campus. The semi-arid climate in Wyoming has resulted in excellent exposures of diverse rock types ranging in age from Precambrian to Recent. Deformation of the rocks in the region has been extensive, affording the student a field laboratory that exhibits a wide diversity of styles of faulting and folding. Mineral deposits, petroleum resources and coal abound in the region.

**Undergraduate Majors**

The Bachelor of Science in geology is designed for those students who intend to become professional geologists and/or those who plan to attend graduate school in geosciences. The program includes courses normally expected of graduate school applicants, including a summer field camp and courses in related sciences and mathematics. This degree program prepares students for the examination for the professional geologist license.

The Bachelor of Arts in geology and Earth sciences is specifically designed for undergraduates who wish to study Earth sciences as a foundation for careers in a variety of areas, such as environmental law, natural resource business, land use planning, Earth science education, science journalism, and many governmental positions. The B.A. program includes a broad spectrum of courses, and focuses both on information about the Earth and on how society makes decisions that affect the Earth system.

The Bachelor of Science in Environmental Geology and Geohydrology is designed for those students who intend to become professionals in environmental fields such as

consulting, site assessment, hazard assessment, and remediation. The degree will prepare students for graduate school in environmental disciplines and for entry-level jobs.

Majors in any of the degree programs above may also choose to declare an affiliated degree with the School of Environment and Natural Resources by completing degree requirements for both degrees. Students should consult the section on the School of Environment and Natural Resources.

The Department of Geology and Geophysics also participates in the Earth System Science interdisciplinary program by offering a concentration in geology for the B.S. degree in ESS. Students interested in this major should consult the section on Earth System Science for curriculum requirements.

**Geology Program Objectives:  
Bachelor of Science**

The primary mission of our B.S. geology program is to provide a quality educational experience that prepares men and women to enter careers in geology and related fields. We expect that our graduates should:

- Have the basic knowledge and skills demanded for entry-level competence in typical careers in earth science.
- Be able to apply basic scientific and technical knowledge to specific tasks and problems.
- Cultivate the specific scientific and technical skills that will allow them effectively to serve their employers and to enhance their own career development.
- Develop increased capacity in the skills of independent learning, critical thinking, problem definition, and problem solving.
- Develop enhanced numerical skills and computer literacy as part of an undergraduate program designed to deliver a current and relevant knowledge of their discipline.
- Communicate effectively and professionally through oral, written, and graphical means and to participate effectively in their workplace and in individual and team-related activities.
- Have the broad general education needed to appreciate the role of Earth Sciences in the societal context and appreciate the importance of ethics in the practice of the profession.

## Geology Program Goals: Bachelor of Science

The department of Geology and Geophysics has the following specific goals for its B.S. program:

- Students in the B.S. program will receive a quality preparatory education in the discipline that is current, relevant, practical, and personal.
- B.S. students who graduate with appropriate grades will be able to compete successfully for positions at graduate schools nationwide.
- B.S. students who graduate with appropriate grades will be well prepared for entry-level positions as professionals within their and other related disciplines.

## Geology Program Objectives: Bachelor of Arts

The primary mission of our B.A. geology program is to provide a broad educational experience that prepares men and women for careers in earth science-related fields. We expect that our graduate should:

- Have the basic knowledge and skills demanded for entry-level competence in typical careers in earth science-related fields.
- Be able to apply their knowledge to specific situations or problems.
- Cultivate the skills and ethics that will allow them effectively to serve their employers and to enhance their own career development.
- Develop increased capacity for independent learning, critical thinking, and problem solving.
- Develop basic numerical skills and computer literacy as part of an undergraduate program designed to deliver a current and relevant knowledge of their discipline.
- Communicate effectively and professionally through oral, written, and graphical means and to participate effectively in the work environment, both in individual and team-related activities.
- Have the broad general education needed to appreciate the role of Earth Sciences in the societal context and appreciate the importance of ethics in the practice of the profession.

## Geology Program Goals: Bachelor of Arts

The department of Geology and Geophysics has the following specific goals for its B.A. program:

- Students in the B.A. program will receive a broad preparatory education in earth science and related fields that is current, relevant, practical, and personal.
- B.A. students who graduate with appropriate grades will be able to compete successfully for positions at graduate schools nationwide.
- B.A. students who graduate with appropriate grades will be well prepared for entry-level positions in the geosciences and other related disciplines.

## Required Academic Performance

In order to graduate with a Bachelor of Science or Bachelor of Arts degree in geology, the student must earn a letter grade of C (S where appropriate) or better in each course listed herein as part of the required course programs. This grade requirement applies to course work taken outside the department, as well as to transfer courses credited in lieu of resident requirements.

## Bachelor of Science Curriculum Geology Program

### I. Required Courses Hrs.

#### One of the following:

GEOL 1005 Earth History or.....	4
GEOL 1100 Physical Geology or .....	4
GEOL 1200 Historical Geology or.....	4
GEOL 1500 Water, Dirt, Climate .....	4

#### And each of the following:

GEOL 2000 Geochemical Cycles & Earth Systems.....	4
GEOL 2005 Introduction to Geophysics or GEOG 3005 Principles of Geophysics .....	4
GEOL 2010 Mineralogy .....	3
GEOL 2020 Petrology .....	2
GEOL 2100 Stratigraphy & Sedimentation.....	4
GEOL 4610 Structural Geology & Tectonics .....	4
GEOL 4717 Field Course in Geology .....	6
(to be taken in 1 of the last 2 summers on campus)	
GEOL 4820 Capstone .....	3

## II. Additional 18 credit hours in Geology courses at 2000-level and above:

### III. Allied Math and Sciences (20 credits)

	Hrs.
CHEM 1020 or 1050 General Chem I .....	4
CHEM 1030 or 1060 General Chem II.....	4
MATH 2200 Calculus I.....	4
MATH 2205 Calculus II or MATH 2250 Elem Lin Algebra or GEOL 4525 Environmental Data Analysis .....	3-4
PHYS 1110 or 1210 Gen or Engr Physics .....	4

Note: This program represents a minimum proficiency. Students are strongly advised to elect additional courses in geology.

## Bachelor of Science Curriculum Environmental Geology and Geohydrology (EGGH) Program

The Environmental Geology and Geohydrology degree is designed for those students who intend to become professionals in environmental fields such as consulting, site assessment, hazard assessment, and remediation. The degree will prepare students for graduate school in environmental disciplines and for entry-level jobs.

### I. Required Courses Hrs.

#### One of the following:

GEOL 1005 Earth History or.....	4
GEOL 1100 Physical Geology or .....	4
GEOL 1200 Historical Geology or.....	4
GEOL 1500 Water, Dirt, Climate .....	4
GEOL 1600 Global Sustainability .....	4

#### And each of the following:

GEOL 2000 Geochemical Cycles, Earth System .....	4
GEOL 2010 Mineralogy.....	3
GEOL 2080 General Field Geology.....	3
GEOL 2100 Strat and Sediment.....	4
GEOL 4444 Geohydrology.....	4
GEOL 4490 Geochemistry .....	4
GEOL 4777 Geochem of Natural Waters .....	3
GEOL 4880 Earth Surface Processes .....	3
GEOL 4820 Capstone .....	3

### II. Required Allied Math and Science Courses

CHEM 1020 General Chem I .....	4
CHEM 1030 General Chem II .....	4
PHYS 1110 or 1210 Gen or Engr Physics .....	4
MATH 2200 Calculus I.....	4
MATH 2205 Calculus II .....	4

#### One of the following:

LIFE 1010 General Biology or.....	4
STAT 2050 Fund of Statistics or .....	4
MATH 2210 Calculus III or.....	4
PHYS 1120 General Physics II or .....	4
PHYS 1220 Engr Physics II .....	4

**III. Additional 18 credit hours of Electives, in consultation with adviser**

GEOL 2005 Intro to Geophysics or GEOL 3005 Principles of Geophysics .....	4
GEOL 2020 Intro to Petrology .....	2
GEOL 2070 Intro to Oceanography .....	4
GEOL 4610 Structure & Tectonics.....	4
GEOL 3400 Geologic Hazards .....	4
GEOL 3500 Global Change.....	4
GEOL 3600 Earth & Mineral Res.....	4
GEOL 3650 Energy, Geological Persp .....	4
GEOL 4001 Modeling in Earth System .....	4
GEOL 4113 Geological Remote Sensing .....	4
GEOL 4525 Environmental Data Analysis .....	4
GEOL 4888 Glaciology .....	3

NOTE: Students are encouraged, in consultation with their adviser, to design a major that best fits their interests and goals. With this in mind, there are many courses outside the Department of Geology and Geophysics that may be substituted for courses in the Electives (B) list above provided that such substitutions are made with the consent of an adviser. A list of such courses may be obtained from the Department. Students who seek the Geology BS may not also seek EGGH as a double major, and vice versa.

**Bachelor of Arts in Geology and Earth Science Curriculum**

<b>I. Required Courses</b>	<b>Hrs.</b>
<i>Each of the following:</i>	
GEOL 1000-level intro lab course(s).....	4-8
GEOL 2000 Geochemical Cycles & Earth System .....	4
GEOL 2010 Mineralogy.....	3
GEOL 2020 Intro to Petrology .....	2
GEOL 2100 Stratig/Sedimentation.....	4
GEOL 2080 General Field Geology.....	3
GEOL 4820 Capstone .....	3
LIFE 1010 General Biology.....	4
CHEM 1020 General Chemistry I.....	4
PHYS 1110 General Physics I.....	4
MATH 1405 Trigonometry .....	3
or	
MATH 1450 Algebra/Trig.....	5
<b>II. Six courses from the following:</b>	
ATSC 2000 Meteorology.....	4
or	
GEOG 3450 Weather and Climate .....	3
ECON 2400 Economics of the Environment .....	3
GEOG 3010 Landforms and Soils.....	3
GEOL 2005 Intro to Geophysics or GEOL 3005 Principles of Geophysics .....	4
GEOL 2050 Principles of Paleontology.....	3
GEOL 2070 Intro to Oceanography .....	4
GEOL 3600 Earth & Mineral Resources .....	4

GEOL 3650 Energy:Geological Persp.....	4
GEOL 3400 Geologic Hazards .....	4
GEOL 3500 Global Change.....	4
GEOL 4444 Geohydrology.....	4
GEOL 4490 Geochemistry .....	3
GEOL 4610 Structural Geol/Tectonics.....	4
GEOL 4835 Applied/Exploration Geophysics.....	3
POLS 4051 Environmental Politics and Admin.....	3
SOIL 4120 Genesis, Morphology, Classification of Soils.....	4
ECON 4400 Environmental Economics .....	3
or	
ECON 4410 Natural Resource Economics..	3

**III. Additional 12 hours of electives with adviser consultation, at least 6 hours of which must be taken outside of the Department of Geology and Geophysics.**

**Undergraduate Minor**

A minor in geology requires 20 hours of coursework in the Department of Geology and Geophysics. Students are required to take GEOL 1100, 1200, or 1500; GEOL 2000; GEOL 3400, 3500, or 3600; and 8 additional credits in consultation with their adviser. A grade of C or better is required in each of these courses.

**Graduate Study**

The department offers instruction and research programs leading to master of science and doctor of philosophy degrees in both geology and geophysics and to the master of science in geology/water resources.

**Program Specific Admission Requirements**

All applicants must complete an online departmental application form with statement of intent. Forms are available from the Department of Geology and Geophysics Web site at geology.uwyo.edu.

Application deadline is January 15 of each year.

All applicants should have completed undergraduate coursework including mathematics through calculus, one year of chemistry, basic training in geology, and for most areas, one year of calculus-based physics.

Applicants to the geophysics graduate program should have an undergraduate degree in geophysics, geology, mathematics, physics, or engineering.

Applicants to the Ph.D. program, without a M.S. degree, must have attained an exceptional undergraduate record.

Formal approval of application by the departmental admissions committee.

Formal acceptance by an adviser.

Formal notice of admission by the university.

**Program Specific Graduate Assistantships**

All applicants to the geology and geophysics graduate program are considered for assistantships. Applicants are NOT required to complete the graduate assistant application form.

**Program Specific Degree Requirements**

*Master of Science in Geology*

**Plan A (thesis) (26 hours of coursework and 4 hours of thesis)**

Preliminary and initial advising shall take place upon acceptance to the graduate program to identify background deficiencies and develop a list of required deficiency coursework to be taken. Deficiency coursework must be completed with a grade of B or better early in the student's graduate residence.

GEOL 5020 Fundamentals of Research is required of ALL graduate students during the first semester of residence.

All graduate students in geology must complete two semesters of GEOL 5200. Distinguished Lecture Series in the first two semesters of residence plus Rocky Mountain Field Trip.

All M.S. students in the Department of Geology and Geophysics will be required to complete a qualifying exam by the end of the second term in residence. Specific department examination requirements are available from the department office. Failure of this exam may result in dismissal from the graduate program.

The candidate's committee shall evaluate the thesis and conduct the final examination. The final exam is an oral presentation of the thesis, oral defense of thesis, and oral responses to questions relating to ancillary topics. Failure of this exam can result in dismissal. Retaking of the exam is subject to the discretion of the candidate's graduate committee.

**Master of Science in Geophysics****Plan A (thesis) (26 hours of coursework and 4 hours of thesis)**

Preliminary and initial advising shall take place upon acceptance to the graduate program to identify background deficiencies and develop a list of required deficiency coursework to be taken. Deficiency coursework must be completed with a grade of B or better early in the student's graduate residence.

GEOL 5020 Fundamentals of Research is required of ALL graduate students during the first semester of residence.

All graduate students in geophysics must complete two semesters of GEOL 5210. Distinguished Lecture Series in the first two semesters of residence plus Rocky Mountain Field Trip.

All M.S. students in the Department of Geology and Geophysics will be required to complete a qualifying exam by the end of the second term in residence. Specific department examination requirements are available from the department office. Failure of this exam may result in dismissal from the graduate program.

The candidate's committee shall evaluate the thesis and conduct the final examination. The final exam is an oral presentation of the thesis, oral defense of thesis, and oral responses to questions relating to ancillary topics. Failure of this exam can result in dismissal. Retaking of the exam is subject to the discretion of the candidate's graduate committee.

M.S. candidates in geophysics must complete 6 hours of mathematics and three hours of physics or engineering courses at the graduate level.

M.S. candidates must take at least 12 hours of 4000- and 5000-level courses in geophysics. Recommended graduate level mathematics courses include differential equations, numerical analysis, and real and complex variables; in physics and engineering they include classical mechanics, continuum mechanics, elasticity, electricity and magnetism. Substitutions for graduate-level geophysics courses may be made with the permission of the candidate's adviser. Remaining graduate-level course requirements may be made up from courses in physics, engineering, mathematics, and geology.

**Doctor of Philosophy in Geology (42 hours of coursework and 30 hours of dissertation research)**

Preliminary and initial advising will identify background deficiencies and develop a list of required deficiency coursework. Deficiency coursework must be completed with a grade of B or better early in the student's graduate residence.

Completion of GEOL 5020 Fundamentals of Research is required during the first semester of residence.

All graduate students in Geology must complete two semesters of GEOL 5200. Distinguished Lecture Series in the first two semesters of residence plus Rocky Mountain Field Trip.

All Ph.D. students in the Department of Geology and Geophysics will be required to complete a qualifying exam by the end of the second term in residence. Specific department examination requirements are available from the department office. Failure to complete the exam by the end of the second semester in residence without an approved extension will result in suspension of the student's financial support, irrespective of the source of funding. Ph.D. students who fail the exam will be asked to withdraw from the graduate program or to enroll in the M.S. program.

The preliminary examination is administered following completion of 30 hours of 4000-level or higher coursework, not including independent study or research credits. Failure of this exam may, at the discretion of the thesis committee, lead to a re-examination during the following semester in residence, remedial work, or expulsion from the program.

The Ph.D. dissertation and its defense are described in the regulations section of this *Catalog*. Specific department examination requirements are available from the department office. The candidate's committee is responsible for monitoring progress of the research, refereeing the written work, and administering the final examination.

**Doctor of Philosophy in Geophysics (42 hours of coursework and 30 hours of dissertation research)**

Preliminary and initial advising will identify background deficiencies and develop a list of required deficiency coursework. Deficiency coursework must be completed with a grade of B or better early in the student's graduate residence.

All graduate students in geophysics must complete two semesters of GEOL 5210. Distinguished Lecture Series in the first two semesters of residence plus Rocky Mountain Field Trip.

Completion of GEOL 5020 Fundamentals of Research is required during the first semester of residence.

Ph.D. candidates in geophysics must complete at least 6 additional hours of graduate-level coursework: 3 in mathematics and 3 in physics or engineering. Recommended graduate-level mathematics courses include differential equations, numerical analysis, and real and complex variables; in physics and engineering, they include classical mechanics, continuum mechanics, elasticity, electricity and magnetism. Ph.D. candidates are required to take at least 12 hours of 5000-level geophysics courses exclusive of GEOL 5854. Substitutions for graduate-level geophysics courses may be made with the permission of the candidate's adviser. Remaining graduate-level course requirements may be made up from courses in physics, engineering, mathematics, and geology.

All Ph.D. students in the Department of Geology and Geophysics will be required to complete a qualifying exam by the end of the second term in residence. Specific department examination requirements are available from the department office. Failure to complete the exam by the end of the second semester in residence without an approved extension will result in suspension of the student's financial support, irrespective of the source of funding. Ph.D. students who fail the exam will be asked to withdraw from the graduate program or to enroll in the M.S. program.

The preliminary examination is administered following completion of 30 hours of 4000-level or higher coursework, not including independent study or research credits. Failure of this exam may, at the discretion of the thesis committee, lead to a re-examination during the following semester in residence, remedial work, or expulsion from the program.

The Ph.D. dissertation and its defense are described in the regulations section of this *Catalog*. Specific department examination requirements are available from the department office. The candidate's committee is responsible for monitoring progress of the research, refereeing the written work, and administering the final examination.

**Master of Science in Geology/Water Resources and Master of Science in Geophysics/Water Resources**

Please refer to the Water Resources section of the *Catalog* for degree requirements.

## Geology and Geophysics (GEOL)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦PN]).

**1001. Earth Science and Society. 1. [I,L♦(none)]** Introduces students to the study of Earth Science and its role in society through examination and discussion of current events, and through projects researching geologic topics of societal interest. *Prerequisite:* GEOL 1100 or concurrent enrollment.

**1005. Earth History. 4. [S♦(none)]** Reviews the evolution of the Earth including: the creation of the Universe, formation of a layered earth, development and history of continents, controls on climate change, and the origin and evolution of life. Class introduces basic geologic, chemical, physical and biologic concepts used to decipher Earth history.

**1070. The Earth: Its Physical Environment. 4. [SE♦(none)]** Discusses selected topics from geology, astronomy and meteorology illustrating fundamental concepts, processes, products and the interrelationships among them. Emphasizes nature of science and relationship between selected topics and society. Cross listed with ASTR 1070. *Prerequisites:* Math level 3 or equivalent courses, consent of instructor, elementary education major and EDCI 1450 must be taken concurrently.

**1100. Physical Geology. 4. [SE♦PN]** Studies modern concepts of the Earth's physical makeup including minerals and rocks, topography, crustal structure, plate tectonics and processes and forces acting on and within the earth.

**1101. First-Year Seminar. 3. [(none)♦FYS]**

**1110. Physical Geology for Engineers. 4. [(none)♦PN]** Introduction to geologic principles for engineers with emphasis on near-surface processes and material properties. The first half will teach planetary basics, mineral/rock and geologic structure, surface processes, geologic material strength and deformation, and geohazards. The final half covers methods and analysis with the collection of geophysical data on-campus to assess near-surface properties with a full lab report. *Prerequisites:* MATH 1400 and MATH 1405 or MPE score of 5 or higher or SAT Math score of 600 or higher or ACT Math score of 27 or higher.

**1500. Water, Dirt, and Earth's Environment. 4. [SE♦PN].** Introductory environmental geology course focusing on water and soil both as hazards and as life-sustaining resources. Explores surface processes and climate change over geological and human timescales. Case studies illustrate the environmental tradeoffs of resource use. Cross listed with ENR 1500.

**1600. Global Sustainability: Managing Earth's Resources. 4. [G,S♦(none)].** Uses biology, chemistry, physics and Earth science to examine Global Sustainability and how this worldview might guide our future management of Earth resources. Case studies in different international settings place questions of resource exploitation (discovery, extraction, processing, use and disposal) and sustainability in a larger global context.

**2000. Geochemical Cycles and the Earth System. 4. [SE♦(none)].** Introduces the Earth system, including the solid Earth, hydrosphere, biosphere and atmosphere. Emphasizes the evolution of the Earth, rock associations and geochemical cycles. Cross listed with ESS 2000. *Prerequisites:* a 1000-level GEOL course with a lab and concurrent enrollment in CHEM 1020. (Normally offered fall semester)

**2005. Introduction to Geophysics. 4.** Mechanisms and driving forces of Earth deformation, at length-scales from the tectonic to the microstructural. Introduces solid bodies, including stress and strain, rheologies and cracking, with applications to plate tectonics, deformation of rocks and surficial processes. Fluid and heat flow is introduced, with applications to tectonic and hydrologic problems. *Prerequisites:* 1000-level GEOL course with lab, MATH 1450 or higher. (Normally offered spring semester)

**2010. Mineralogy. 3.** Introduction to rock-forming minerals. Includes introduction to crystallography, crystal chemistry, and the occurrence and identification of the common minerals, with emphasis on silicates. Field trip required. *Prerequisites:* GEOL 1005, 1100, or 1500; CHEM 1020 or concurrent enrollment.

**2020. Introduction to Petrology. 2.** Introduces the study of igneous, sedimentary, and metamorphic rocks in hand specimen. Covers textural and mineralogic classification of rocks and the tectonic environments in which they occur. Field trip required. *Prerequisite:* GEOL 2010.

**2050. Principles of Paleontology. 3.** Examines scientific principles, biological and geological, that underlie general study of ancient life on Earth. Includes interactions of evolutionary, stratigraphic, taphonomic

and paleogeographic concepts within various approaches to paleobiology and systematic paleontology. Optional field trip. *Prerequisite:* GEOL 1100 or LIFE 1000 or 1010. (Normally offered spring semester)

**2070. Introduction to Oceanography. 4.** Survey of ocean processes, including the major subdisciplines of physical, geological, chemical, and biological oceanography. Studies the form of the world ocean; composition and chemistry of seawater; circulation, currents, waves and tides; nutrients and organisms; estuaries and coastal processes; origin and distribution of deep-sea sediments; and impacts of human activities. *Prerequisites:* GEOL 1005, 1100, 1200, 1500 or ENR 1500; MATH 1405 or 1450.

**2080. General Field Geology. 3. [SE♦(none)]** Covers basic concepts of geology and field techniques emphasizing interpretation of geologic features in the field. Weekly field trip required. *Prerequisite:* GEOL 1100, 1200, 1005 or 1500. (Normally offered the first half of the fall semester)

**2100. Stratigraphy and Sedimentation. 4.** Introduces principles of stratigraphy, materials and processes of sedimentation. Laboratory includes study and interpretation of sedimentary rocks, sedimentary structures and stratigraphic techniques. Field trip required. *Prerequisite:* GEOL 2010. (Normally offered fall semester)

**2150. Geomorphology. 4.** Discusses general principles of landform description and analysis. *Prerequisite:* GEOL 1100 or equivalent.

**2220. Communicating Earth Science. 3.** This course will focus on communicating science to non-scientists. Students will deliver earth science information through written, digital and oral presentations to be informative and interesting to the public. *Prerequisites:* grade of C or higher in GEOL 2010, COM1.

**3040. Introduction to Groundwater. 3.** This class will introduce the basic principles of Groundwater Hydrology such as hydrological cycle, mass balance, fluid properties, mechanics of flow through porous media, Darcy's law, aquifer and aquitards, groundwater wells, groundwater geology, and surface water/groundwater interaction. *Prerequisites:* A grade of B or higher in MATH 1405 or MATH 1450.

**3110. Invertebrate Paleontology. 4.** Encompasses taxonomy and morphology of major groups of invertebrate fossils. Includes examples of their use in correlation, environmental reconstruction and interpretation of evolution. *Prerequisite:* GEOL 1200. (Normally offered spring semester)

**3250. Geosciences and Computers. 4. [I♦(none)]** An integrated introduction to the basic components of modern scientific

computing and to illustrate basic computing concepts through geoscience applications. *Prerequisite:* One USP designated science course with lab.

**3400. Geologic Hazards: A Historical and Scientific Review. 4. [SE,◆(none)]** Geologic hazards include well-known catastrophic events such as earthquakes, volcanic eruptions and landslides, as well as lesser known processes such as soil expansion, land subsidence and ground failure. Economically, the latter processes have a much greater impact each year than the more notorious geologic events. Reviews geologic hazards from a historical and scientific perspective. Describes relevant geologic processes, how geologic evidence is used to identify regions at risk, monitoring procedures and the role of the scientist in predicting catastrophic geologic events. Prehistoric and historic events are used to illustrate temporal and spatial scales of geologic hazards. *Prerequisite:* junior standing.

**3500. Global Change: A Geological Perspective. 4.** Considers the geochemical and geophysical systems that control the Earth's climate, the geological and historical record of climate change, and then discusses the possible effect that human activities will have upon these chemical and geophysical systems. *Prerequisites:* junior standing and an introductory class in the physical sciences.

**3600. Earth and Mineral Resources. 4. [SE,G,◆PN]** Explores the geologic formation, production, and use of Earth and mineral resources, including building materials, chemical minerals, industrial minerals and metals. For each resource, the geologic environment and processes of formation are discussed. Exploration and mining techniques for each resource are also reviewed and associated environmental problems and regulations examined. Beneficial and detrimental aspects of the use of each resource are also discussed. *Prerequisite:* completion of USP QA and L.

**3650. Energy for Society: Addressing the Energy Grand Challenge. 4. [SE,G,◆PN]** Examines the energy needs of a modern industrialized society. Looks at the types of energy, the natural laws that govern its use, transformation, and conservation. The different sources of energy available to modern societies are examined. Examination includes fossil fuels, nuclear power as well as alternative energy sources. The formation of the resource is discussed, how it is extracted, and any environmental consequences associated with its extraction and use. *Prerequisite:* completion of USP QA and L.

**4000. Paleomagnetism in Geology/Geophysics. 3.** Studies paleomagnetic solutions in geoscience topics. Includes plate reconstructions; sea-floor formation; structural geology; dating of structural/tectonic events; western North American tectonics; global geomagnetic polarity reversals and time scale; magnetostratigraphic correlation; stratigraphic dating; dating diagenetic events; characteristics of core and mantle; extraterrestrial impacts and geologic phenomena; environmental and climate change applications. Field trip and laboratory project required. Dual listed with GEOL 5000. *Prerequisite:* GEOL 1000 or 1100; GEOL 1200 desirable.

**4001. Modeling the Earth System. 4.** Takes a modeling approach to demonstrate how the Earth is integrated into an interconnected system through exchanges of energy and matter, and how Earth system functioning is susceptible to human alteration. Unifying concepts focus on quantitative interactions between the Earth and the Sun, and between the Earth's lithosphere, hydrosphere, biosphere and atmosphere. Cross listed with BOT/ATSC/ESS 4001. *Prerequisites:* MATH 2205 or equivalent and [ESS 2000 or GEOL 2000].

**4025. Igneous and Metamorphic Petrology. 4.** An advanced study of igneous and metamorphic rocks in hand sample and thin section. Covers optical techniques for identifying minerals, the use of phase diagrams and geochemistry to understand the evolution of igneous rocks and the formation conditions of metamorphic rocks. A field trip is required. *Prerequisite:* GEOL 2020.

**4030. Groundwater Flow and Solute Transport Modeling. 3.** Movement of groundwater and the dissolved solute is responsible for a variety of environmental, engineering, and geological processes of interest. Presents an overview of the analyses of groundwater flow and solute transport using numerical modeling. The principles of the Finite Difference Method are introduced. Dual listed with GEOL 5030. *Prerequisites:* MATH 2205, GEOL 5444.

**4050. Geology of Wyoming. 3.** Survey of the geologic history of Wyoming beginning in the Precambrian and extending to the present. Stratigraphic and sedimentation history, igneous activity, metamorphism, and orogenic activity are emphasized in the lectures. Occasional field trips are required. *Prerequisite:* GEOL 1100 or an equivalent course. (Normally offered fall semester)

**4060. Rocky Mountain Field Trip. 1 (Max. 3).** A six-day geological field trip to various classic localities in the Rocky Mountains. *Prerequisites:* senior standing and GEOL 2010 and GEOL 4610 or 4050.

**4113. Geological Remote Sensing. 4.** Acquaints students with aircraft and spacecraft remote sensing of the environment, emphasizing geologic application to earth and other planetary bodies. Includes visible, infrared, ultraviolet, radio and radar sensing. Laboratory exercises are applications related to tectonics, geomorphology, paleoclimate, structure, stratigraphy, environmental geology and geologic hazards. Dual listed with GEOL 5113; cross listed with GEOG 4113. *Prerequisites:* GEOL 1005 or 1100 or 1200 or GEOG 1010 and MATH 1400/1405 or MATH 1450.

**4125. Igneous Petrology. 2.** Studies igneous rocks in thin section. Lectures cover mineralogy, geochemistry, phase equilibria and occurrence of igneous rocks. Labs study suites of igneous rocks in thin section. *Prerequisite:* GEOL 2010. (Offered fall semester of odd-numbered years)

**4130. Metamorphic Petrology. 2.** Studies metamorphic rocks in thin section. Lectures cover mineralogy, phase equilibria and occurrence of metamorphic rocks. Labs study suites of metamorphic rocks in thin section. *Prerequisite:* GEOL 2010. (Offered spring semester of odd-numbered years)

**4150. Paleontology of Lower Vertebrates. 4.** Explores evolutionary histories of lower vertebrates including fishes, amphibians, reptiles and birds. Optional field trip. *Prerequisites:* acceptable previous training in geology or zoology, 12 hours of biology and/or geology or ZOO 4000. (Normally offered every third year)

**4170. Paleontology of Cenozoic Placental Mammals. 4.** Explores evolutionary histories of placental mammals characteristic of Cenozoic era as documented through fossil record study. Optional field trip. *Prerequisite:* 12 hours of biology and/or geology or ZOO 4000. (Normally offered every third year)

**4190. Petroleum Geology. 3.** Principles governing the exploration for hydrocarbons; characteristics of reservoirs and traps; origin, migration and accumulation of hydrocarbons; subsurface evaluation techniques. Dual listed with GEOL 5190. *Prerequisite:* GEOL 2005 or PETE 3000.

**4191. Methods in Petroleum Geology. 3.** Lectures and laboratory exercises are designed to give the student experience in working with various kinds of geoscientific data in relation to the exploration for and production of hydrocarbons. Most exercises utilize real data and real situations. Topics include recognition of hydrocarbons, interpretation of sample, mud and geophysical logs, geologic utilization of drill stem tests; subsurface correlation and

mapping techniques; prospect generation. Dual listed with GEOL 5191. *Prerequisite:* GEOL 4190.

**4200 [4010]. Topics in Geology. 1-3 (Max. 9).** Studies particular geology topics in-depth at undergraduate level. *Prerequisites:* senior standing and 20 hours in geology.

**4210 [4020]. Topics in Geophysics. 1-3 (Max. 9).** Studies particular geophysics topics in-depth at undergraduate level. *Prerequisites:* senior standing and 20 hours in geology.

**4270. Hydrogeophysics. 3.** Estimating groundwater parameters, contaminant transport, porosity and other hydrologic properties using geophysics. Integrates literature review, discussion, exercises and writing to introduce students to hydrogeophysics research. Students will acquire skills at reading technical publications, writing, and gain knowledge about current trends in the field. Emphasis on critical thinking and analysis of writing. *Prerequisites:* 20 hours of geology or engineering courses.

**4280. Paleobotany. 4.** An examination of the ecology and evolution of land plants throughout Earth history that emphasizes the profound impact plants have had on Earth's surface and atmosphere. Through a combination of lecture, discussion, and laboratory, the course will explore fossilized plant communities, their ecological properties, and effects of major environmental upheavals. Dual listed with GEOL 5280. Cross listed with BOT 4280. *Prerequisite:* LIFE 1010 or GEOL 1100.

**4310. Advanced Stratigraphy. 3.** Deals with characterizing and predicting the vertical and lateral distribution of sedimentary rocks. Includes correlation methods; use of facies models; facies delineation; impact of tectonics and changes in relative sea level on sedimentary record; transgressions and regressions; concept and construction of stratigraphic framework; and sequence stratigraphy. *Prerequisite:* GEOL 2100. (Normally offered spring semester)

**4320. Cenozoic Stratigraphy. 4.** Studies areal distribution, lithogenesis, depositional environment, correlation and faunas of North America's Cenozoic deposits. Optional field trip. *Prerequisite:* GEOL 2100. (Offered based on sufficient demand and resources)

**4420. Sedimentary Rocks. 4.** Encompasses origin, classification and interpretation of sedimentary rocks including sandstones, mudrocks and carbonates. Topics also include diagenesis and basin analysis. Field trip required. *Prerequisites:* GEOL 2010 and GEOL 2100. (Offered every other even-numbered year)

**4440. High-Performance Computing for Scientists and Engineers. 3.** Gives students an integrated introduction to the design, analysis and implementation of parallel

codes on modern HPC systems. This course is interdisciplinary in nature, involving case studies in biology, physics, mathematics and geosciences. HPC systems at ARCC will be used for hands-on exercises. Offered satisfactory/unsatisfactory only.

**4444. Geohydrology. 4.** Discusses principles governing occurrence, movement and extraction of water in subsurface geologic environment. One required weekend field trip in September. Dual listed with GEOL 5444. *Prerequisite:* MATH 2205. (Normally offered spring semester)

**4460. Planetary Geology. 3.** Examines basic principles of planetary geology and their application to specific planetary examples. Core topics include solar system formation, impact cratering, and comparative planetology. Provides an opportunity to test terrestrial theories under extreme conditions, and provides insight into both early earth history and ongoing geological processes. *Prerequisites:* GEOL 2010 and GEOL 2100 and (Math 1400/1405 or 1450).

**4470. Introduction to Geomodeling. 3.** Introductory course in numerical modeling in the geosciences, offering coding experience as well as insight into the generalities of modeling. We develop, in class, simple geo-models, which allow experience constructing and testing computer models. As a minimum we will develop one extensive Finite Difference model and one minimalistic Finite Element model; other techniques will depend on student interests. *Prerequisites:* at least one semester of college level calculus and one semester of college level physics.

**4490. Geochemistry. 4.** Discusses chemical evolution of the Earth and details of chemical thermodynamics, phase rule chemistry, equilibrium reactions and reaction kinetics as applied to geology. *Prerequisites:* GEOL 2010, CHEM 1020, MATH 2200, 2205. (Normally offered spring semester)

**4525. Environmental Data Analysis. 4.** Explores fundamentals of environmental data analysis including the display and description of data, uncertainty propagation, statistical significance and power, t-tests, ANOVA, time series, serial correlation, multiple regression, and sample collection strategies. Students must enroll in a computer-based lab session and complete a term project involving real-world problems in data analysis. Dual listed with GEOL 5525. Cross listed with ENR 4525/5525. *Prerequisites:* A grade of C or better in STAT 2050 or STAT 2070 or MATH 2200, junior standing or higher, and completion of at least one upper-division course in the natural sciences or a related field.

**4610. Structural Geology and Tectonics. 4.** Encompasses lectures, readings and problems dealing with character and causes of structures that deform Earth's crust. Field trips required. *Prerequisite:* GEOL 2010. (Normally offered fall semester)

**4666. Plate Tectonics. 3.** Studies theory of plate tectonics including quantitative assessment of observations which lead to its acceptance. Includes geometry of plate tectonics, plate boundaries and plate motions at present and in the past, evolution of plates including sea floor spreading and subduction processes, as well as driving mechanisms. Two lectures, one laboratory/discussion per week. Dual listed with GEOL 5666. *Prerequisites:* GEOL 4610, geology/geophysics math requirements. (Offered based on sufficient demand and resources)

**4717 [5100]. Field Course in Geology. 2-6 (Max. 6).** Reviews field observation of geologic phenomena, methods of geologic mapping and interpretation of data collected. Course includes a six-week field trip. *Prerequisites:* GEOL 2100, 4610. (Offered early summer)

**4720 [4700]. Ore Deposits. 4.** Teaches principles of economic geology of ore minerals. Lectures cover geochemistry of ore minerals and environments in which various ore minerals are found. Labs include identification of ore minerals in hand sample and under microscope and methodology of economic geology. Dual listed with 5720. *Prerequisite:* GEOL 2020. (Normally offered fall semester)

**4760. Rates and Timescales of Surface Processes. 3.** Explores methods for quantifying rates and timescales of weathering, erosion, soil formation, nutrient cycling and other surface processes. Focus includes cosmogenic nuclides, tracer thermochronometry, U-series disequilibrium, fallout radionuclides, and optically stimulated luminescence. Course features a mix of instructor-driven lectures on fundamentals and student-driven discussion of cutting-edge research from recent literature. Dual listed with GEOL 5760. *Prerequisites:* GEOL 2150 or GEOG 3010 or GEOL 4880 and MATH 2205 and CHEM 1020 and PHYS 1100.

**4777. Geochemistry of Natural Waters. 3.** Studies physical chemistry applied to natural waters, and chemistry of rock weathering, sources and controls on major, minor and trace elements, plus problems related to introduced pollutants. Dual listed with GEOL 5777. *Prerequisites:* GEOL 2010, MATH 2205, and CHEM 1030.



**4800. Independent Study. 1-3 (Max. 6).** Encompasses field, laboratory or library research for senior students in department. *Prerequisites:* senior standing and not fewer than 20 hours in geology. (Offered fall, spring and summer)

**4820. Capstone. 3. [WC♦COM3]** Critical examination of landmark papers and their influence on the Earth sciences. Through readings, lectures, discussions and in oral and written presentations, the student will gain a broad perspective over the impact of key issues in the field. *Prerequisites:* junior standing and 26 hours in the department. (Normally offered spring semester)

**4835 [4970]. Applied/Exploration Geophysics. 3.** Discusses the fundamentals of Applied or Exploration Geophysics, encompassing lecture, laboratory classes and discussion of case histories. It covers the Seismic Refraction, Seismic Reflection, Gravity, and Magnetics methods. Provides a solid grounding about the exploration of the Earth's subsurface for mineral and hydrocarbon resources, and environmental issues. Dual listed with GEOL 5835. *Prerequisites:* GEOL 1100, one year of physics and MATH 2210. (Normally offered spring semester)

**4850. Principles of Digital Filtering and Time Series Analysis. 3.** Studies principles and applications of data processing techniques as used in seismic exploration, oceanography, gravity and magnetic prospecting, remote sensing and other areas of earth science. Includes discrete versus continuous time series; fourier and Z-transforms; layer matrix analysis; reflectivity function; deconvolution and predictive deconvolution; digital filter design; array analysis; velocity filters; and migration. *Prerequisite:* mathematics through calculus. (Normally offered fall semester)

**4880. Earth Surface Processes. 3.** Quantitative interpretation of Earth's surface processes. Uses a quantitative approach to demonstrate how the development of landforms can be modeled. *Prerequisites:* MATH 2205 (2210 preferred), PHYS 1210.

**4888. Glaciology. 3.** Dynamics of frozen water. Covers behavior of ice masses, in the form of glaciers or ice-sheets, and geomorphic aspects of glacial erosion and deposition. Includes forcing and feedbacks between cryosphere and global climate. *Prerequisite:* MATH 2205, PHYS 1210 (1310). (Offered every second year spring semester)

**5020. Fundamentals of Research. 2.** Lectures, discussion and projects centered on three fundamental aspects of research: development of research tools, understanding the scientific method, learning how to write a grant, read the literature and present a talk.

Class is designed for all incoming graduate students in the department. *Prerequisite:* graduate standing.

**5030. Groundwater Flow and Solute Transport Modeling. 3.** Movement of groundwater and the dissolved solute is responsible for a variety of environmental, engineering, and geological processes of interest. Presents an overview of the analyses of groundwater flow and solute transport using numerical modeling. The principles of the Finite Difference Method are introduced. Dual listed with GEOL 4030. *Prerequisites:* MATH 2205, GEOL 5444.

**5050. Introduction to Isotope Geology. 3.** Understanding of atomic structure, radioactive decay, mass spectrometry, dating techniques and petrologic uses of isotopic systems. Emphasis will be placed on evaluating dating methods in relation to particular geologic problems and possible sources of error. The use of isotopes in defining magmatic sources and crustal contamination are discussed. *Prerequisites:* CHEM 1020, CHEM 1110, MATH 2200, MATH 2205.

**5113. Geological Remote Sensing. 4.** Acquaint students with aircraft and spacecraft remote sensing of the environment, emphasizing geological application to earth and other planetary bodies. Includes visible, infrared, ultraviolet, radio and radar sensing. The laboratory exercises are applications related to tectonics, geomorphology, paleoclimate, structure, stratigraphy, environmental geology and geologic hazards. Dual listed with GEOL 4113 and cross listed with GEOG 4113/5113. *Prerequisites:* GEOL 1005 or 1100 or 1200 or GEOG 1010 and MATH 1400/1405 OR MATH 1450.

**5120. Tectonic Evolution of the North American Cordillera. 4.** Phanerozoic tectonic evolution of western North America viewed through the paradigm of plate tectonics. Course involves intensive literature review, guest speakers, a possible field trip, and an in-depth regional tectonic analysis to be done by each student. *Prerequisite:* GEOL 2020, GEOL 2100, and GEOL 4610.

**5140. Advanced Igneous Petrology. 4.** Review of the classification of igneous rocks, physical characteristics of magmas and processes of magmatic differentiation. Using this knowledge, the course examines the major type of global magmatism. Topics considered include mid-ocean ridges, subduction zones, layered complexes and continental volcanism. *Prerequisite:* GEOL 2020.

**5150. Metamorphic Petrology. 4.** Lectures on field occurrence, macroscopic and microscopic characteristics of igneous rocks, followed by lectures on application of physical

chemistry to genetic study of igneous rocks. Laboratory devoted to the study of suites of igneous rocks from classical areas. *Prerequisite:* GEOL 2020 and 4490; graduate standing.

**5160. Regional Tectonics. 4.** The study of orogenic belts worldwide including both external and internal zones. Cross-section preparation is emphasized as well as geometric analysis. Includes lectures, readings, and a cross-section project. *Prerequisite:* GEOL 4610.

**5180. Reflection Seismology. 3.** Lectures treating seismic methods applied to the study of earth structures ranging from exploration to crustal structure. Topics covered include wave propagation recording techniques, processing, modeling, resolution and interpretation. Laboratory exercises give practical experience on lecture topics and emphasize use of instruments and data analysis. Computer processing introduced. *Prerequisite:* GEOL 1200, one year of calculus and one year of physics.

**5190. Petroleum Geology. 3.** Principles governing the exploration for hydrocarbons; characteristics of reservoirs and traps; origin, migration and accumulation of hydrocarbons; subsurface evaluation techniques. Dual listed with GEOL 4190. *Prerequisites:* GEOL 2100, 4610.

**5191. Methods in Petroleum Geology. 3.** Lectures and laboratory exercises are designed to give the student experience in working with various kinds of geoscientific data in relation to the exploration for and production of hydrocarbons. Most exercises utilize real data and real situations. Topics include recognition of hydrocarbons, interpretation of sample, mud and geophysical logs, geologic utilization of drill stem tests; subsurface correlation and mapping techniques; prospect generation. *Prerequisite:* GEOL 5190.

**5200. Topics in Geology. 1-3 (Max. 9).** Provides a detailed study at a graduate level of a particular topic in geology. *Prerequisite:* graduate standing in geology and geophysics and permission of the instructor.

**5210. Topics in Geophysics. 1-3 (Max. 9).** Provides a detailed study at a graduate level of a particular topic in geophysics. *Prerequisite:* graduate standing in geology and geophysics and permission of instructor.

**5211. Seminar in Structural Geology and Tectonics. 1 (Max. 6).** Selected topics in structural geology and tectonics. On-going research among undergraduate and graduate students is emphasized. *Prerequisite:* GEOL 4610 or equivalent course.

**5212. Sedimentary Seminar. 1 (Max. 3).** Seminar in selected topics in sedimentary geology. Designed to bring, and keep, graduate students up to date with the current literature

and new, unpublished ideas. Visiting lecturers and presentations of student and faculty research. *Prerequisite:* graduate standing.

**5215. Inverse Theory. 3.** Inverse theory is about learning the techniques to invert data for an acceptable model. The simplest example is least-squares fitting of a line. Covers inversion of both over and under-determined inverse problems, regularization techniques, bayesian theory, along with probabilistic viewpoints. *Prerequisites:* graduate standing in geology and geophysics; linear algebra, MATLAB programming.

**5216. Global Seismology. 3.** Introductory class in theoretical seismology with emphasis on wave propagation. Topics include elastic wave theory for body and surface waves, normal modes, anisotropic wave propagation, source processes, derivation of the wave equation, the ray theoretical approximation, representation theorems, stress/strain constitutive relations, normal modes, surface waves, and attenuation operators. *Prerequisites:* graduate standing in geology or geophysics and permission of the instructor.

**5217. Geodynamics. 3.** Examines the fundamental physical processes necessary for the understanding of plate tectonics and a variety of other geological phenomena. Provides a solid grounding for future study and research covering plate tectonics, stress & strain, elasticity, isostasy & the flexural strength of the lithosphere, gravity, and thermal processes. *Prerequisites:* GEOL 1100, one year of college-level Physics and MATH 2210.

**5220. Vertebrate Morphology and Evolution. 2.** Course for paleontology majors and vertebrate anatomists involving advanced concepts, recent literature, and research training in the areas of morphology and evolution of fossil vertebrates. Cross listed with ZOO 5220. *Prerequisite:* GEOL/ZOO 4150 or GEOL/ZOO 4160, or GEOL/ZOO 4170 or ZOO 4000.

**5230. Vertebrate Paleobiogeography. 2.** Lectures and discussions devoted to use of data from the fossil record of vertebrates in interpreting ancient distributions of land-masses and seaways, recognizing paleoclimatic changes, and documenting the evolution of zoogeographic provinces. *Prerequisite:* GEOL/ZOO 4150, or GEOL/ZOO 4160 or GEOL/ZOO 4170.

**5240. Vertebrate Biostratigraphy. 2.** Lectures, discussion, and exercises devoted to use of the fossil record of vertebrates (with emphasis on mammalian assemblages) in recognizing contemporaneous physical and/or biological events within and between geographic areas. Field trip. *Prerequisite:* GEOL/ZOO 4150 or GEOL/ZOO 4160 or GEOL/ZOO 4170.

**5270. Hydrogeophysics. 3.** Estimating groundwater parameters, contaminant transport, porosity and other hydrologic properties using geophysics. Integrates literature review, discussion, exercises and writing to introduce students to hydrogeophysics research. Students will acquire skills at reading technical publications, writing, and gain knowledge about current trends in the field. Emphasis on critical thinking and analysis of writing. *Prerequisites:* 20 hours of geology or engineering courses.

**5280. Paleobotany. 4.** An examination of the ecology and evolution of land plants throughout Earth history that emphasizes the profound impact plants have had on Earth's surface and atmosphere. Through a combination of lecture, discussion, and laboratory, the course will explore fossilized plant communities, their ecological properties, and effects of major environmental upheavals. Dual listed with GEOL 4280. Cross listed with BOT 5280. *Prerequisite:* LIFE 1010 or GEOL 1100.

**5300. Sedimentary Basins. 4.** Sedimentary basin evolution are examined from the view point of plate tectonics, thermal histories, and lithospheric processes. Quantitative basin modeling techniques are applied to understanding subsidence histories, sea level changes, and the primary controls on the formation of stratigraphic sequences. *Prerequisite:* 1 year of calculus.

**5330. Mechanics of Sediment Transport, Erosion and Deposition. 4.** Erosion, transport, and deposition of sediments are examined from a first-principles basis. Physical processes are derived from fluid dynamics, statistical mechanics, and mass conservation. These topics are then used to explore landscape and seascape evolution, morphodynamics, and stratigraphic construction. *Prerequisites:* GEOL 2100 or equivalent.

**5340. Advanced Tectonics and Sedimentation. 3.** Lectures, seminars, and field observations on the relations between tectonism and the sedimentary record. Topics include a review of plate tectonic theory, characteristics of major types of sedimentary basins, techniques for evaluating tectonic activity from evidence in the sedimentary record and large-scale tectonosedimentary elements. *Prerequisites:* graduate standing, GEOL 2100, and GEOL 4610.

**5410. Geochemical Analytical Methods. 4.** Lectures and laboratories in analytical methods used in geochemical studies. Particular emphasis given to sampling and sample preparation, inductively coupled argon plasma emission, atomic absorption analysis. Other analytical methods are also treated. *Prerequisite:* GEOL 4490.

**5420. Surfaces and Interfaces. 3.** Examines the role of surfaces and solid-solution interfaces in regulating the chemistry of the Earth's surface. Subjects to be covered includes surface tension, capillarity, and the thermodynamics of surfaces; the equilibrium and kinetic chemistry of absorption-desorption; dissolution-precipitation kinetics and controlling factors; surface catalysis; and surface oxidation-reduction reactions. Presented in the context of geochemically and environmentally important processes such as chemical weathering, partitioning of solutes between water and surfaces, and the transport and degradation of pollutants. *Prerequisite:* One of the following: GEOL 4490, 4777, 5777, CHEM 3020, CHEM 4507.

**5430. Applied Geostatistics. 3.** Designed to provide general geostatistical analyses and their applications for spatial random variables and functions. Topics covered include variogram, cross validation, kriging, cokriging, sampling strategies, and both non-conditional and conditional simulations. Several geostatistics packages are used to analyze real field data and students are encouraged to use their own data for practicing geostatistical applications. Examples are taken from geohydrology, soil science, crop science, mining, and various environmental studies. *Prerequisite:* STAT 4010.

**5444. Geohydrology. 3.** Discusses principles governing occurrence, movement and extraction of water in subsurface geologic environment. Once required weekend field trip in September. Dual listed with GEOL 4444. *Prerequisite:* MATH 2205.

**5446. Introduction to Geostatistics. 3.** The development of the basic principles of geostatistics and its practical applications in the geosciences will be presented. Main topics include: spatial analysis, kriging, cokriging, geostatistical simulations (unconditional, conditional). If time permits additional topics include: simple kriging, indicator kriging and block kriging. *Prerequisites:* MATH 2200, 2205, 2250 and STAT 2000.

**5450. Geochemical Modeling. 3.** Modeling of geochemical processes in fluid-rock systems of the Earth's crust. Emphasizes development and application of conceptual models as well as quantitative numerical models. Reinforces and expands fundamental skills in aqueous and fluid-rock geochemistry to better understand geochemical processes and solve problems in fluid-rock systems. *Prerequisite:* GEOL 4777/5777 or GEOL 5610 or GEOL 4490.

**5470. [5460]. Introduction to Geomodeling. 3.** Introductory course in numerical modeling in the geosciences, offering coding experience as well as insight into the generalities of modeling. We develop, in class, simple geo-models,

which allow experience constructing and testing computer models. As a minimum we will develop one extensive Finite Difference model and one minimalistic Finite Element model; other techniques will depend on student interests. *Prerequisites:* at least one semester of college level calculus and one semester of college level physics.

**5525. Environmental Data Analysis. 4.** Explores fundamentals of environmental data analysis including the display and description of data, uncertainty propagation, statistical significance and power, t-tests, ANOVA, time series, serial correlation, multiple regression, and sample collection strategies. Students must enroll in a computer-based lab session and complete a term project involving real-world problems in data analysis. Dual listed with GEOL 4525. Cross listed with ENR 4525/5525.

**5550. Numerical Methods in Ground Water Geology I. 3.** Numerical solution of ground water flow equations with emphasis on steady state and elementary time dependent finite difference techniques. *Prerequisites:* GEOL 4444 or 5444, competence in FORTRAN programming.

**5560. Numerical Methods in Ground Water Geology II. 3.** Time dependent digital simulation models designed to forecast impacts of ground water developments. *Prerequisite:* GEOL 5550.

**5570. Advanced Geohydrology. 3.** Aquifer performance and testing, ground water basin development and management, conjunctive use of ground and surface water, and regional water resource investigations. *Prerequisite:* GEOL 4444 or 5444.

**5600. Theoretical Petrology. 3.** Graphic and analytical techniques used to evaluate the genesis of igneous and metamorphic rocks. Principles of thermodynamics, activity-composition relations, and G-X diagrams will be reviewed. Igneous topics include: use of phase diagrams, heat and mass transfer, magma generation. Fluid rock equilibria and Schreinemaker's analysis will be used to evaluate the origin of metamorphic rocks. *Prerequisites:* GEOL 4490.

**5610. Geological Thermodynamics I. 4.** Laws of thermodynamics, conditions which constitute chemical equilibrium, and multiple component systems as applied in geologic problems. *Prerequisites:* MATH 2200, MATH 2205, CHEM 1030, consent of instructor.

**5630. Electronic Microprobe. 3.** Lectures cover the theory of X-ray emission analysis, microprobe instrumentation, and data reduction procedures. Labs cover various uses of microprobe in solving geological problems. *Prerequisites:* consent of instructor.

**5640. Advanced Igneous Petrology Seminar. 1-3 (Max. 9).** Advanced training in igneous petrology emphasizing applications of chemical principles to the study of igneous rocks. Each year a different aspect of igneous petrology are covered in detail. *Prerequisites:* GEOL 4490, 5050.

**5650. Advanced Metamorphic Petrology. 3.** Review of the literature and study of the advanced concepts in metamorphic petrology. *Prerequisite:* GEOL 5150.

**5660. Microstructural Analysis of Deformed Rocks. 4.** The use of microscope in the interpretation of natural strain in rocks is emphasized. Lectures and extensive laboratory exercises are the principle components of the course. Microfabric analysis using the universal stage is introduced. *Prerequisites:* GEOL 4610 required, GEOL 5150 recommended.

**5666. Plate Tectonics. 3.** The theory of plate tectonics including a quantitative assessment of the observations which lead to its acceptance and limitations. Topics include: geometry of plate tectonics, plate boundaries and plate motions at present and in the past, evolution of plates including sea floor spreading and subduction processes, and driving mechanisms. Two lectures, one laboratory/discussion per week. Dual listed with GEOL 4666. *Prerequisites:* GEOL 4610, geology/geophysics math requirements.

**5700. Seminar in Structure and Development of the Earth's Crust. 3.** Seminar in structure and development of the Earth's crust. Topics include structure and geochemistry of the Precambrian plate tectonics in the Precambrian early history of the Earth, seismic refraction crustal models, seismic reflection crustal models, and crustal genesis. *Prerequisites:* admission is by consent of instructor, GEOL 4610 and one semester of geophysics.

**5720. Ore Deposits. 4.** Teaches principles of economic geology of ore minerals. Lectures cover geochemistry of ore minerals and environments in which various ore minerals are found. Labs include identification of ore minerals in hand sample and under microscope and methodology of economic geology. Dual listed with GEOL 4720. *Prerequisite:* GEOL 2010.

**5730. Seismic Data Processing. 3.** Fundamentals of seismic reflection data processing: processing of field tapes, cross-correlation, velocity analysis, stacking, deconvolution. Statistics correct, migration, coherency filtering. *Prerequisites:* GEOL 5180, MATH 4430, MATH 4440.

**5760. Rates and Timescales of Surface Processes. 3.** Explores methods for quantifying rates and timescales of weathering, erosion, soil formation, nutrient cycling and

other surface processes. Focus includes cosmogenic nuclides, tracer thermochronometry, U-series disequilibrium, fallout radionuclides, and optically stimulated luminescence. Course features a mix of instructor-driven lectures on fundamentals and student-driven discussion of cutting-edge research from recent literature. Dual listed with GEOL 4760. *Prerequisites:* GEOL2150 or GEOG 3010 or GEOL 4880 and MATH 2205 and CHEM 1020 and PHYS 1100.

**5777. Geochemistry of Natural Waters. 3.** Physical chemistry of solutions applied to natural waters. Chemistry of rock weathering, controls on major, minor, and trace element contents of natural waters. Problems of introduced pollutants. Dual listed with GEOL 4777. *Prerequisites:* GEOL 2010, MATH 2205, and CHEM 1030.

**5800. Advanced Remote Sensing and Technical Mapping. 2-5 (Max. 5).** Application of computer methods to spectral analysis, image processing, geometric correction, data transformation, global positioning, digital photogrammetry, and automated interpretation. Integration of spectral data, image interpretation, field mapping, photogrammetric analysis, and map/image analysis will be emphasized. *Prerequisite:* consent of instructor.

**5820. Advanced Geomorphology. 1-3 (Max. 6).** Graduate reading and discussion seminar on current topics in surficial processes. An in-depth analysis of the literature and work, with the subject matter determined by student interest. May include lectures. *Prerequisite:* senior or graduate standing in geology.

**5835. Applied/Exploration Geophysics. 3.** Discusses the fundamentals of Applied or Exploration Geophysics, encompassing lecture, laboratory classes and discussion of case histories. Covers the Seismic Refraction, Seismic Reflection, Gravity, and Magnetics methods. Provides a solid grounding about the exploration of the Earth's subsurface for mineral and hydrocarbon resources and environmental issues. Dual listed with GEOL 4835. *Prerequisite:* graduate standing in geology.

**5850. Economic Geology. 1-6 (Max. 6).** *Prerequisite:* graduate standing in geology.

**5851. Environmental Geology. 1-6 (Max. 6).** *Prerequisite:* graduate standing in geology.

**5852. Geochemistry. 1-6 (Max. 6).** *Prerequisite:* graduate standing in geology.

**5853. Geomorphology. 1-6 (Max. 6).** *Prerequisite:* graduate standing in geology.

**5854. Geophysics. 1-6 (Max. 6).** *Prerequisite:* graduate standing in geology.

**5855. Ground Water Hydrology. 1-6 (Max. 7).** *Prerequisite:* graduate standing in geology.

- 5856. Mathematical and Statistical Geology. 1-6 (Max. 6).** *Prerequisite:* graduate standing in geology.
- 5857. Mineralogy and Crystallography. 1-6 (Max. 6).** *Prerequisite:* graduate standing in geology.
- 5858. Paleontology. 1-6 (Max. 6).** *Prerequisite:* graduate standing in geology.
- 5859. Petrology. 1-6 (Max. 6).** *Prerequisite:* graduate standing in geology.
- 5860. Sedimentology. 1-6 (Max. 6).** *Prerequisite:* graduate standing in geology.
- 5861. Stratigraphy. 1-6 (Max. 6).** *Prerequisite:* graduate standing in geology.
- 5862. Structural Geology. 1-6 (Max. 6).** *Prerequisite:* graduate standing in geology.
- 5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.
- 5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.
- 5940. Continuing Registration: Off Campus. 1 - 2. (Max 16).** *Prerequisite:* advanced degree candidacy.
- 5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.
- 5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.
- 5980. Dissertation Research. 1-12. (Max. 48).** Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.
- 5990. Internship. 1-12 (Max. 14).** *Prerequisite:* graduate standing.

## Global and Area Studies

Cheney International Center 206,  
766-3423

FAX: (307) 766-3533

E-mail: [uwinst@uwyo.edu](mailto:uwinst@uwyo.edu)

Web site: [uwyo.edu/intstudy/](http://uwyo.edu/intstudy/)

Director: David Messenger

### Professor:

**JEAN A. GARRISON**, B.A. University of Wyoming 1990; M.A. University of South Carolina 1992; Ph.D. 1996; Professor of Political Science, Global and Area Studies 2010, 2001.

### Associate Professor:

**DAVID MESSENGER**, B.A. McGill University 1993; M.A. University of Toronto 1994; Ph.D. 2000; Associate Professor of History and Global and Area Studies 2011, 2006.

**ALI H. RADDAOUI**, B.A. Ecole Normale Supérieure, Tunis, Tunisia 1981; M.A. Indiana University-Bloomington 1985; Ph.D. 1988; Associate Professor of Arabic 2010.

### Assistant Professors:

**NEVIN AIKEN**, B.A. University of Western Ontario 2003; M.A. 2004; Ph.D. University of British Columbia 2010; Assistant Professor of Political Science and Global and Area Studies 2010.

**YI-LING CHEN**, B.S. National Taiwan University 1989; M.S. 1992; Ph.D. Rutgers University 2000; Assistant Professor of Global and Area Studies and Geography 2010.

**ADAM HENNE**, B.A. Drew University 1997; Ph.D. University of Georgia 2008; Assistant Professor of Global and Area Studies and Anthropology 2008.

**TOM SEITZ**, B.S. University of the State of New York 1988; M.A. University of Kent at Canterbury 1989; Ph.D. University of Cambridge 1997; Assistant Professor of Global and Area Studies 2009, 2012.

**MARCUS WATSON**, B.S. SUNY Brockport 1995; M.A. Cornell University 2005; Ph.D. 2009; Assistant Professor of Global and Area Studies and African American and Diaspora Studies 2010, 2012.

### Senior Lecturer:

**YARONG JIANG ASHLEY**, B.A. University of Shanghai 1986; M.A. University of Wyoming 1995; Ph.D. 1993; Senior Lecturer 2009, 2000.

### Assistant Lecturers:

**ANNE ALEXANDER**, B.B.A. New Mexico State University, 1991; M.S. 1993; Ph.D. University of Wyoming, 2001; Assistant Lecturer, Director of International Programs, Associate Dean of the Outreach School 2013.

**RUTH BJÖRKENWALL**, B.A. University of Berkeley, 1989. Assistant Lecturer 2013.

### Professor Emeritus:

Garth Massey

### Advisory Committee:

Stephanie Anderson, political science  
Nevin Aiken, political science and global and area studies  
Yarong Ashley, global and area studies  
Ruth Björkenwall, global and area studies  
Edward Bradley, agricultural and applied economics  
Yi-Ling Chen, global and area studies, geography  
Lydia Dambekalns, secondary education  
Susan Dewey, gender and women's studies  
Jean Garrison, political science, global and area studies  
Adam Henne, global and area studies, anthropology  
Manuela Hofer-McIntyre, global and area studies  
David Messenger, history, global and area studies  
Linette Poyer, anthropology  
Ali Raddaoui, religious studies, global and area studies  
Terri Rittenburg, management and marketing  
Tom Seitz, global and area studies  
Marcus Watson, global and area studies, African American and diaspora studies

### Adjunct Faculty

(see department section following name for academic credentials)

Stephanie Anderson, political science  
Tanja Börzel, political science, Freie Universitaet Berlin  
Ed Ward Bradley, agricultural economics  
Michael Brose, history  
Roger Coupal, agriculture and applied economics  
Lydia Dambekalns, secondary education  
Antoinette DeNapoli, religious studies  
Susan Dewey, gender and women's studies  
Andrew Garner, political science  
Michael Harkin, anthropology  
Marianne Kamp, history  
Timothy Kearley, law  
Joseph Krafczik, Russian  
Carolyne Larson, history  
Shiri Noy, sociology

Mark Peterson, management and marketing  
 Joanna Poblete, history  
 Lin Poyer, anthropology  
 Thomas Risse, political science,  
 Freie Universitaet Berlin  
 Terri Rittenburg, management  
 and marketing  
 Amy Roberts, elementary and early  
 childhood education  
 Chris Rothfuss, global and area studies  
 Mona Schatz, social work  
 Richard J. Schmidt, civil and  
 architectural engineering  
 Audrey Shalinsky, anthropology  
 Ed Sherline, philosophy  
 J.J. Shinker, geography  
 Lilia Soto, American studies  
 and latina/o studies  
 Sarah Strauss, anthropology  
 Jim Thurman, international studies, political  
 science - Central Wyoming College  
 Ruth Toulson, anthropology  
 Gerald Webster, geography  
 Bonnie Zare, gender and women's studies

## Undergraduate Learning Outcomes

**Goal 1.** Students graduating with a BA in international studies will be able to recognize and appreciate the historical, political, social, cultural, and economic dimensions of international processes and issues, integrating these into an interdisciplinary perspective.

**Goal 2.** Students graduating with a BA in international studies will have the capability to critically read, write about, discuss, and engage in scholarly inquiry related to international processes and issues.

**Goal 3.** Students graduating with a BA in international studies will have a minimal level of fluency in a second language and are expected to experience a foreign locale in which to use the second language skills.

**Goal 4.** Students will be made aware of career and post-graduate opportunities suitable for an international studies major.

## Graduate Learning Outcomes

All students who graduate with a Master's degree in international studies will be able to:

- Engage in independent empirical inquiry that makes an original contribution to the field of study;
- Think critically and reason logically about a problem and the ways it can be answered;
- Employ the best recognized methods appropriate to their research;

- Effectively develop alternative explanations, use theories and concepts to guide the research project, and conduct the work in such a way that disproof is possible; and
- Present their work intelligently, with both written and oral capability at a level of professional expectations.

They will have a broad understanding of:

- International affairs;
- The diversity of national cultures and social structures;
- Political and economic systems;
- Major global trends and problems.

## Undergraduate International Studies Curriculum

Students graduating with a degree in international studies will be able to recognize and appreciate the historical, political, social, cultural, and economic dimensions of international processes and issues, integrating these into an interdisciplinary perspective. In addition to courses housed in the Global and Area Studies Program, the curriculum consists of numerous interdisciplinary courses across UW's seven colleges, primarily from the departments of political science, history, anthropology, geography, sociology, religious studies, women's studies, African American and diaspora studies, environment and natural resources, and economics.

**Core Courses** - Students take 10 hours of core coursework. INST 1010 (Proseminar) provides an introduction to the international studies major; INST 2350 (Introduction to Global Studies) and INST 2310 (Introduction to International Relations) provide the theoretical framework for the global and regional tracks. INST 4950 (Capstone) provides the culminating experience for students completing the B.A. degree in international studies and fulfills the WC writing requirement for the University Studies Program.

**Area of Focus** - Students will complete a minimum of 18 hours of coursework in two specific areas of focus, choosing a global and regional track. Students must complete a minimum of 9 hours in each track. Global and regional tracks have suggested Gateway courses. Most Gateway courses fulfill University Studies requirements.

*Global Tracks* - Governance and Conflict Resolution; Economic Systems; Culture and Social Issues; Sustainable Development and the Environment

*Regional Tracks* - Africa and the Middle East; Asia and the Pacific Rim, Europe and the Former Soviet Union; Latin America.

**Foreign Language** - Students must complete 18 hours in a single foreign language with one course at the 3000/4000-level, or show an equivalent level of proficiency. Language courses must be conversational language courses. American Sign Language is not considered a foreign language.

**Electives** - Students must take 9 hours of elective courses from the international studies curriculum, six of which must be upper division. One of the following Gateway courses can count for the elective requirement: ANTH 1200, ECON 1000, GEOG 1000, POLS 1200, INST 1330.

All required courses for the major must be passed with a grade of C or better. There are numerous special topics courses offered during the academic year and these courses can fulfill the international studies requirements with approval from your adviser. Students are encouraged to satisfy the USP QB (quantitative reasoning) requirement by taking STAT 2070, Introductory Statistics for Social Sciences.

International Studies majors are encouraged to study abroad or do an internationally-focused internship. Opportunities are listed on the Global and Area Studies website.

## Minors

Students can minor in 3 areas by fulfilling one of the following sets of requirements:

1. International Studies Minor. Twenty-seven hours of coursework including at least 12 hours in a foreign language, 15 hours of international studies curriculum, with a minimum of 9 hours at the 3000-level or above.
2. Asian Studies Minor—a minimum of 27 credit hours, which includes 12 hours in an Asian language and 9 hours of upper-division coursework. For detailed requirements, see [www.uwyo.edu/intstudy/undergrad/asianminor.asp](http://www.uwyo.edu/intstudy/undergrad/asianminor.asp).
3. European Studies Minor—a minimum of 30 credit hours, which includes 12 hours in a single modern European language other than English, and 9 hours of upper division coursework. For detailed requirements, see [www.uwyo.edu/intstudy/undergrad/eruoepanstudies-minor.asp](http://www.uwyo.edu/intstudy/undergrad/eruoepanstudies-minor.asp).

## Graduate Study

### Graduate Studies Director:

**Marcus Watson, Assistant Professor**

Students take either the Plan A (thesis), or master's international Peace Corps option. Students taking the Plan A option must have a minimum of 26 hours of graded non-thesis coursework and 4 hours of thesis; students taking the master's international option must have 24 hours of non-thesis coursework and complete their 6 hours Peace Corps internship credit.

### Program Specific Admission Requirements

Admission is open to all students with a bachelor's degree who meet the university minimum requirements.

For information about application requirements, please see the Global and Area Studies Program website: <http://www.uwyo.edu/instudy/ma%20degrees/admissionrequirements.html>

Note: As a prospective student, you should apply to graduate school first. When accepted, submit your application to the Peace Corps. After completing initial coursework and being assigned to your country of service, you will travel to your site and begin training.

The deadline for receipt of all application materials is February 1st. The Global and Area Studies Program only admits students for the Fall semester.

### Program Specific Graduate Assistantships

Students interested in a graduate assistantship should complete the "Application for a Graduate Assistantship" and upload it with their application materials by February 1 for the fall semester. On this date, only complete application packets will be considered.

### Program Specific Degree Requirements

#### *Master's Program*

Students must meet three requirements: 1) Each student must take INST 5400. 2) Each student must take INST 5200. 3) Each student must demonstrate proficiency in a foreign language, accomplished in the course of the program or from previous experience or coursework. Foreign language hours do not count toward the M.A. degree. Note: Master's

International - Peace Corps option has separate requirements. Please see below for more information.

The program also offers a joint International Studies/Environment and Natural Resources degree. See [www.uwyo.edu/intstudy/](http://www.uwyo.edu/intstudy/) for specific degree requirements.

#### *Plan A (thesis)*

Students are encouraged to construct, with the adviser's approval, a program that focuses their own intellectual interests and career plans. To promote that end, students should be prepared to file a plan of study with the graduate adviser during the second semester of coursework.

No later than the second semester in residence, each student shall select a graduate committee to oversee his or her academic work. The committee will be chaired by the student's major professor and must have at least one member from a discipline other than that of the major professor. Students also will prepare a thesis proposal and give a presentation of their preliminary project before the Global and Area Studies faculty and complete a thesis prospectus defense with their graduate committee by the end of their second semester.

Students must pass an oral examination at the completion of their program. Normally, examination will center on the thesis, but may also encompass coursework of the candidate.

### Required Coursework

Advanced Theory Course

INST 5200 Graduate Proseminar in

International Studies

Research Methods Course

INST 5400 International Social Science

Research Methods

#### *Master's International - Peace Corps Option*

Minimum requirements: 30 hours of graduate work, including 24 hours of graduate coursework and completion of Peace Corps service.

Students admitted to the Peace Corps - but not yet having served - take 24 hours of graduate coursework, working closely with a faculty mentor to prepare themselves for two academic tasks associated with their Peace Corps assignment. The first involves preparatory readings, completion of a proposal and presentation of the preliminary project before the Global and Area Studies faculty, and writing of a critical analytic paper associated with the locale of their anticipated Peace Corps service. It is submitted to three faculty members (their graduate committee) prior to

beginning service. The second involves writing an applied analytic paper based on their Peace Corps service. The paper will be guided by the student's graduate committee and is due no later than six months following the completion of Peace Corps service.

Students must pass an oral examination at the completion of their program. Normally, this examination will center on the second paper, but may also encompass coursework of the candidate.

Students are encouraged to specialize in one of three areas: agriculture, environment and natural resources, and non-governmental organizations (NGO) administration.

The curriculum for the concentration in agriculture is intended to give the student a general understanding of the issues facing agrarian-based communities. The focus of the curriculum is on economic development and natural resource management issues.

The environment and natural resources concentration allows students to learn about and practice innovative approaches to environmental and natural resource management issues from a global perspective.

The NGO concentration is intended for students who would like a volunteer placement that involves working with NGOs. The curriculum provides a basic foundation in public administration with an emphasis on the relationships, challenges and opportunities that shape the work of civil society organizations.

For more specific information on course requirements for the Master's International - Peace Corps concentrations, please visit the website at: [www.uwyo.edu/instudy/](http://www.uwyo.edu/instudy/).

Students also have the option of developing another concentration based on personal experience and interests, although this may be limited by the availability of course offerings.

### Required Coursework for Master's International - Peace Corps Program

Advanced Theory Course

INST 5200 Graduate Proseminar in

International Studies

Research Methods Course

INST 5400 International Social Science

Research Methods

### Graduate Minor in International Studies

A graduate minor in international studies provides students in graduate programs other than international studies with the opportunity to acquire a basic graduate-level familiarity with international relations, global

processes and cultural diversity around the world. Students acquire a foundation in inter-governmental relations and research methodology. Beyond this, students work closely with a graduate director to fashion a program of study appropriate for their interests and post-graduate plans. The minor complements several other graduate degree programs.

#### *Prerequisites for Admission*

Declaration of an international studies minor is contingent on admission to a master's or doctoral degree program. Application is in the form of a letter of interest to the Director of Graduate Studies, Dr. Marcus Watson, including the background, anticipated course of study, and reason for seeking the minor. An interview with the director is also required. All prerequisites for entering the graduate program in international studies as a major apply to the minor with the exception of proficiency in a second language. Students must be prepared for coursework in international studies at the graduate level and be willing to take prerequisite courses if necessary.

#### *Course and Committee Requirements*

Graduate students minoring in international studies must satisfy the requirements of their graduate major and take twelve credits of guided graduate coursework in international studies. With the approval of the department of the graduate major, these twelve hours may also count toward the major. Students are required to take at least one advanced theory course (INST 5200) and one advanced research methods course. All courses will be determined in consultation with the Graduate Studies Director.

## **International Studies (INST)**

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**1010. Proseminar in International Studies I. 1. [I,L♦(none)]** An introduction to the University as a social institution, international studies, and the International Studies Program. Students are introduced to international studies faculty and students. Emphasis is on topics, approaches, issues and problems falling within the purview of international studies. Offered S/U only.

**1040 [INST 2000]. Introduction to International Business.** A broad study of the field of international business activity and theory and review major foreign environmental forces - financial, economic and socioeconomic, physical, sociocultural, political, legal, labor, com-

petitive, and distributive - within the context of strategic management issues. Cross listed with INBU 1040. Prerequisites: ECON 1010.

**1060. World Regional Geography. 3. [CS,G♦H]** Covers the distributions, traits, and processes of the Earth's peoples and landscapes through the perspective of regional geography, which is the study of the spatial relationships of natural environments and human societies. Equivalent to GEOG 1000. Credit cannot be earned in both GEOG 1000 and INST 1060.

**1101. First-Year Seminar. 3. [(none)♦FYS]**

**1200. Non-Western Political Cultures. 3. [CS,G♦(none)]** Gives students appreciation of non-western political cultures and how these cultures have created different political institutions and practices. Non-Western nations of Asia, Africa, and the Middle East are used as case studies. Cross listed with POLS 1200. (Offered each semester)

**1250. Introductions to Comparative Government. 3.** How do foreign states deal with the numerous challenges to their stability? Do institutions affect a state's approach to solving different problems? How do these different approaches affect policy? This course introduces students to different styles of governance and compare countries from around the world with reference to their political ideology. Cross listed with POLS 1250.

**1330. World History since 1750. 3. [CS,G♦(none)]** A history of the world's peoples and societies from 1750 to the present, with an emphasis on the diversity and interconnectedness of human life in the past. Cross listed with HIST 1330.

**2200. Study Abroad Preparation. 1.** Prepares students for long-term study in a foreign country. Helps students adapt to and understand the host country: culture, history, geography, political and economic context. Students become familiar with practical information needed for a foreign experience, principles of culture shock, ethnocentrism, cultural relativism, and fundamentals of cross-cultural communication. Offered S/U only. Identical to INST 5000.

**2230. Introduction to Asian Studies. 3. [G♦(none)]** South, East, and Southeast Asia are home to virtually half of humankind with the fastest growing economies, poorest nations and hundreds of ethnic groups, rich religions and languages. Introduces cultural, political, economic and environmental landscapes of this diverse region as nations and as regional interrelationships.

**2240. Introduction to African Studies. 3. [WB♦COM2]** Confront African stereotypes by exploring the continent's complex history and current affairs. These realities will be reached with the help of different disciplinary perspectives, such as economics, political science, and anthropology. Equipped with the basics, students will be primed to tackle more advanced courses on Africa. Cross listed with AAST 2240. Prerequisites: WA or equivalent.

**2250. Introduction to Latin American Studies. 3. [(none)♦COM2]** Introduction to the culture, history and politics of Latin America, from the US/Mexico border to the Antarctic ice fields of Patagonia. We will consider historical events and encounters from pre-Conquest times to contemporary crises; out toolkit includes geography, anthropology, history, political economy, literature and cultural studies. Prerequisites: none.

**2260. Foreign Locale. 3-6 (Max. 9).** A UW course taught primarily or entirely in a foreign locale.

**2280. Introduction to European Studies. 3. [(none)♦COM2]** This class aims to introduce student to Europe and to better understand how notions of community and difference, territories and borders, security and identity and institutions are expressed in Europe. Class will emphasize the history of Europe across the twentieth and twenty-first centuries, but will also draw upon politics, geography, sociology, cultural studies and anthropology.

**2300. World Politics in the Post-Cold War Era. 3.** Examines changes that have taken place since the end of the Cold War in perspectives of major world powers, global and regional power balances, patterns of conflict and cooperation and the structure of the world system. Focuses on what these changes portend for the future. Cross listed with POLS 2300. (Offered fall semester)

**2310. Introduction to International Relations. 3. [G♦(none)]** Analyzes nature of international relations, emphasizing various methods of explaining and interpreting international behavior of nation-states. Illustrates contemporary problems of world politics. Cross listed with POLS 2310. (Normally offered once a year)

**2350. Introduction to Global Studies. 3. [CS,G♦(none)]** Turns an interdisciplinary eye on the contemporary world of consuming and global connections. Takes a broad overview of various approaches to the study of globalization, while exploring the links between consumption, civil society, social justice, and ecological integrity.

**2990. Topics in International Studies. 1-6 (Max. 15).** Accommodates seminar series and/or course offerings including those by interdisciplinary teams and visiting faculty in international studies not covered by department courses. *Prerequisite:* WA

**3000 [2100]. Social Change. 3. [G◀(none)]** Studies causes, processes and consequences of structural transformations in historical and comparative perspective. Reviews and assesses forces that account for sociological changes. Explores social change globally as well as in the U.S. Cross listed with SOC 3000. *Prerequisite:* SOC 1000 and junior standing.

**3050 [G&R 3050]. Economic Geography. 3.** Economic geography is the study of the location, distribution and spatial organization of economic activities across the globe; specifically how the economic realm is intertwined with other spheres of international social life. It explores the inherent logics and mechanisms of the capitalist system, and the social and spatial inequalities that result. Cross listed with INST 3050. *Prerequisites:* 6 hours of Social Sciences or International Studies. (Normally offered fall semester every other year)

**3100. Chinese Society. 3. [G◀(none)]** Reviews origins and consequences of Chinese revolution in comparative and cultural perspectives. Discusses influence of historical traditions and social structure on individual lives and behavioral patterns. Cross listed with SOC 3100. *Prerequisite:* SOC 1000.

**3200. Comparative Political Cultures. 3.** Histories and experiences of various societies have shaped their values, norms, beliefs, expectations and attitudes. Explore how the beliefs, values and lifestyles of various societies shape peoples' views of their place in the politics of the state and of the state's place in their daily lives. Cross listed with POLS 3200. *Prerequisites:* 9 hours of INST or POLS.

**3400. Politics and Society of Turkey. 3. [G◀(none)]** Examines the history of Turkey with an emphasis on its relationship with the Western world. Major topics include the Ottoman Empire; Atatürk and the founding of the Republic of Turkey; Turkey's role in the Cold War; Kurdish and other minority populations; the changing Turkish political landscape; the evolution of Islamist politics; and recent relations with the United States and European Union. *Prerequisite:* WA.

**3420. The Anthropology of Global Issues. 3.** Using anthropology's long-term, holistic and comparative approaches, the course examines key global issues, e.g., poverty, war, disease, environmental degradation, and ter-

rorism from an anthropological perspective. Cross listed with ANTH 3420. *Prerequisite:* ANTH 1200.

**3860. Economics of World Food and Agriculture. 3. [G◀(none)]** Explores global food and agricultural issues with a focus on hunger, chronic malnutrition, and diets of people in developing countries. Introduces basic economic concepts pertinent to understanding and analyzing global food markets and prices and to evaluating government policies designed to reduce food insecurity, enhance diets, and promote agricultural development. Cross listed with AGEC 3860. *Prerequisite:* An economics principles course. (Normally offered spring semester)

**4050. Development, Africa, and Culture. 3.** Focuses on the complex and checkered relationships between Western-inspired development and African cultures. Striking a balance among ethnographic case studies, theoretical lenses, and practical implications, understand what Euro-American efforts at foreign development, including contemporary globalization, look like from an African perspective. Provides an understanding of African expectations of development and developers. Dual listed with INST 5050; cross listed with AAST 4050. *Prerequisites:* junior standing and instructor consultation.

**4060. NGOs, Development, and Culture. 3.** Non-governmental organizations (NGOs) have grown exponentially in number and are often viewed as the new and best vehicle for international development. Focuses on international non-governmental organizations (INGOs), in contexts of Western aid to post-colonial societies and the role they play in the international aid system. Understand INGOs from historical, global, and cultural perspectives. Dual listed with INST 5060; cross listed with AAST 4060. *Prerequisites:* junior standing and instructor consultation.

**4100. Global Public Health. 3. [G◀(none)]** Introduces students to the global context of public health, to principles underlying global health, and to dimensions of public health particular to international settings. It examines major themes and policies in global health and analyzes health problems and varying responses to them in different parts of the world. Dual listed with INST 5100; cross listed with HLSC 4100. *Prerequisite:* upper division student status.

**4110. Sociology of International Development. 3 [WC,G◀COM3]** Surveys development studies and rural change, including case studies of deliberate change efforts toward industrialization. Includes peasant modes of food production, daily life in subsistence,

agriculture, shifts to commercial agriculture and global economy, ethical and critical issues of induced change and different approaches to development process and outcomes. Cross listed with SOC 4110. *Prerequisite:* SOC 1000 or ANTH 1200; SOC 3000 recommended. (Offered once a year).

**4155 [4920]. Women, War and Health. 3. [CS,G◀(none)]** Focuses on the physical and psychological health of women and children as influenced by armed conflict. Examines the psychosocial, public health, and socioeconomic effects of living in contemporary war zones or conditions of threatened war. Key international documents that address effects upon women and children are discussed in order to evaluate feminist initiatives to prevent and mediate the consequences of war. Cross listed with WMST/NURS 4155. *Prerequisite:* upper-division standing, lower division social or psychological science course. (Offered every other year)

**4175 [4940]. Gender, Women, and Health. 3. [CS,G◀(none)]** Focuses on issues of gender, women and health, including the effects of gender bias in medical research and health care practices and policies. Health care issues of specific concern to women, both nationally and internationally will be examined. Cross listed with WMST/NURS 4175. *Prerequisite:* upper-division standing, lower division social or psychological science course. (Offered every other year)

**4200. China and Globalization. 3.** The economic reforms in China have been political, cultural, and above all, global processes. Understanding these processes of economic reform tells us much about the role of government, culture, and globalization in the transition from socialism to capitalism. It also tells us a great deal about China's future role in the international community of nations. *Prerequisite:* POLS 1200 or HIST 2041 or SOC 3100.

**4240. Global Sex Work and Trafficking. 3. [G◀(none)]** Drawing upon case studies from Africa, Asia, the Americas and Europe, this course explores the gendered intersections of power and privilege through the lens of sex work, broadly defined as the exchange of intimacy for something of value, and trafficking, defined as coerced forms of sex work. Dual listed with INST 5240; cross listed with WMST 4240. *Prerequisite:* 3-6 hours of WMST or INST.

**4250. Economic Development in Asia. 3. [G◀(none)].** Designed to explore key issues to the historical development of Asian countries from both comparative and international political economy perspectives. Distinctive political, social, and economic characteristics of



these nations will be analyzed. Dual listed with INST 5250. *Prerequisite:* 9 hours of international studies of Asian-focused courses.

**4255. Politics of Developing Nations. 3.** An analysis of the processes of political, economic and social change in the non-Western world. Dual listed with INST 5255; cross listed with POLS 4255. *Prerequisites:* 9 hours of political science or international studies.

**4260. Democratization and Regime Change. 3.** Examines the theoretical/empirical research on causes of democratic transition and consolidation, including new waves of democratization and prospects for democratization in other contexts. Focus is given to a variety of theoretical/methodological perspectives such as the structural, strategic, social/cultural, institutional, and economic approaches. Dual listed with INST 5260; cross listed with POLS 4260. *Prerequisites:* 9 hours of political science or international studies.

**4290. Inter-American Relations. 3.** Surveys inter-American system and idea of hemispheric unity. Analyzes major issues confronting inter-American community. Cross listed with POLS 4290. *Prerequisite:* 9 hours of political science including POLS 2310. (Normally offered every other year)

**4300. The World System. 3.** Analyzes the structure of political and economic interdependence among nation-states. Reviews and assesses theoretical approaches to explaining changing structure of inequality, power, war and peace. Cross listed with POLS/SOC 4300. *Prerequisite:* SOC 1000 or ANTH 1100 or equivalent political science, international studies, or social science course. (Offered based on sufficient demand and resources)

**4330. American Foreign Relations. 3.** Analyzes American foreign policy decision-making process and selected contemporary foreign policy problems. Stresses political and institutional factors, along with analysis of policy options. Cross listed with POLS 4330. *Prerequisite:* 9 hours of political science or international studies including POLS 2310. (Normally offered once a year)

**4340. International Organizations. 3.** Encompasses development of world organizations, such as League of Nations, United Nations and its affiliate bodies. Also studies regional organizations and private international bodies. Cross listed with POLS 4340. *Prerequisite:* 9 hours of political science or international studies including POLS 2310.

**4350. Culture Change. 3.** Examines representative theories of change, factors involved, dynamics of modernization and applied anthropology. Identical to ANTH 4340. *Prerequisite:* ANTH 1200.

**4360. International Peace and Conflict. 3.** Why do nations go to war, engage in atrocities such as genocide, or move toward peace following conflict? Examines underlying processes behind both conflict and peace in the international system, including sources of conflict and ways conflicts might be moved toward sustainable peace. Dual listed with INST 5360; cross listed with POLS 4360. *Prerequisites:* 9 hours of political science or international studies including POLS 2310.

**4370. Global Political Economy. 3. [G♦(none)]** Examines the interaction of politics and the economy at the global level. Evaluates how political and economic decisions of one country or groups of countries affect institutions and life circumstances in others. Assesses the causes of consequences of globalization as rooted in political economy. Cross listed with SOC 4370. *Prerequisites:* SOC 1000 and junior standing or SOC 2100.

**4375. Transitional Justice. 3.** Mechanisms provide accountability for gross human rights violations and acts of mass atrocity within nations. Case studies are used to examine types of transitional justice interventions; tensions between demands of justice at local, national, and international levels; and transitional justice's role in post-conflict peace-building and reconciliation. Dual listed with INST 5375; cross listed with POLS 4375. *Prerequisites:* 9 hours of political science or international studies including POLS 2310.

**4380. International History of Human Rights. 3.** Examine the modern history of human rights in the global system, with particular emphasis on developments since the Second World War. Topics include the philosophy of human rights ideas; the histories of rights and rights violations in various regions; and the resulting international responses. Dual listed with INST 5380; cross listed with HIST 4380. *Prerequisites:* 9 hours of HIST or INST.

**4455. Energy Security. 3.** Evaluates the geopolitical and socioeconomic issues surrounding the roots of energy insecurity and the global challenge to provide adequate, affordable, and accessible energy. Topics of study include the questions of energy nationalism, climate security, import dependence and transportation insecurities, the future of fossil fuels and alternative energies. Dual listed with INST 5455. Cross listed with POLS 4455. *Prerequisites:* 9 hours of INST or POLS, including INST/POLS 2310.

**4485. U.S. Latino Diaspora. 3.** Combines classroom activities and a week-long stay abroad in examining the historical creation and contemporary spread of the Latino Diaspora from the Caribbean to the Yucatan and be-

yond. U.S. Latina/o history, multiculturalism, pan-Latino identity, assimilation, migration trends and natives responses are stressed. Cross listed with HIST/CHST 4485. *Prerequisite:* 9 hours of CHST, HIST, and/or INST related coursework.

**4490. Ethical Trade in Latin America. 3.** Examine the production of everyday products, their socio-ecological contexts, and the complicated global networks of delivery to consumers, particularly with regard to Latin America. The effectiveness and implications of the movement to make international trade more ecologically sustainable and socially just will be examined. Dual listed with INST 5490. *Prerequisites:* 9 hours of international studies or junior status.

**4495. Indigenous Social Movements of Latin America. 3.** Employs an interdisciplinary approach to understanding one of the most interesting political events of the past decades: the emergence of a transnational indigenous people's movement in Latin America. Issues explored in the course include neoliberalism and globalization; social movement theory; multiculturalism and citizenship; legal and cultural pluralism; sustainability, conservation and development. Dual listed with INST 5495. *Prerequisites:* 9 hours of international studies or junior status.

**4540. International Marketing. 3.** Approaches the topic of international marketing from a managerial perspective. Exposure to world environmental characteristics and interdependencies, as well as objectives, strategies and tactics of marketing goods and services to various countries and cultures. Cross listed with MKT 4540. *Prerequisite:* MKT 3210 and junior standing.

**4560. Global Cities. 3.** Globalization accelerates urbanization processes and creates a new type of city, the global city. This course introduces debates over global cities, urban culture, new urban landscapes, urban planning practices, and social disparity. It uses case studies on the cities around the world to explore the diversity of global city formation processes. Dual Listed with INST 5560; cross listed with GEOG 4560. *Prerequisites:* 9 hours of international studies or geography.

**4580. Gender, Global Change, and Development. 3.** Examines the global intersections of gender and public policy through its analysis of five central themes: [1] international development discourse in practice; [2] feminized labor and migration; [3] women's unequal access to resources (including land ownership and education); [4] agricultural production and sustainability; [5] health, reproduction and

mothering. Dual listed with INST 5580; cross listed with WMST 4580. *Prerequisite:* 3-6 hours of WMST or INST courses.

**4582. 20th Century U.S. Foreign Relations.**

**3.** Studies Twentieth Century United States foreign relations with a focus on the Cold War period. Examines economic sources of policy decisions, elites and mass public opinion, as well as cultural, religious, ethnic, racial, and gender issues. Cross listed with HIST 4582; dual listed with INST 5582. *Prerequisite:* HIST 1221.

**4590. Sustainable Business Practices. 3.**

A close look at what is happening in business practice today through the 'lens' of sustainability. Business models and systems will be discussed and a framework proposed for assessing the ways in which principles of sustainability may be embedded within corporate strategy. Cross listed with MKT 4590; dual listed with INST 5590. *Prerequisites:* advanced business standing.

**4650. Women, Gender & Migration. 3.**

From an international context and perspective, this course examines the gendered transformations immigrant women experience. Gender, theories of international migration, assimilation, race, ethnicity, and identity transformation serve as categories of analysis. From a cross-discipline comparative approach, we focus on women's lives to examine differences and similarities to complicate notions of immigration. Cross listed with AMST/CHST/WMST 4650. Dual listed with INST 5650. *Prerequisites:* Junior standing and 6 hours of AMST, CHST, INST, and/or WMST coursework or instructor approval.

**4680. Shanghai: Past & Present. 3.**

**[CS,G◀(none)]** Lectures, fieldtrips, and other cultural activities are all incorporated into the curriculum to help students learn about the political, economic and cultural development in 21st century China. Cross listed with SOC 4680.

**4710. Comparative Systems. 3.**

The study of the origins and characteristics of modern economic systems; similarities and differences in the systems of the U.S., Great Britain, Soviet Union, Germany, India and China. Cross listed with ECON 4710. *Prerequisites:* ECON 3010; QA. (Offered based on sufficient demand and resources)

**4881. International Social Welfare and Social Development. 3.**

Examines the basic framework of social welfare analysis and social development programming in the international arena, employing a multinational comparative analysis approach to explore the wide array of responses to social need across the globe. Students employ multinational com-

parative analyses to an area of social concern. Dual listed with INST 5881; cross listed with SOWK 4881. *Prerequisite:* POLS 1000; ECON 1010 recommended.

**4950. Capstone in International Studies.**

**3. [WC◀COM3]** Integrative course taught by an international studies faculty member. Students analyze in depth a topic from one of a variety of international studies approaches, organizing their research in concert with others in the class. Emphasis is on the quality of research and presentation. *Prerequisite:* senior standing in international studies.

**4970. Internship in International Studies.**

**1-6 (Max. 15).** Integrates practical international experience with academic knowledge. Students are expected to participate in specifically assigned tasks and observe broader activities of sponsoring organization, and reflect on experience in written assignments. Satisfactory/unsatisfactory only. Dual listed with INST 5970. Available for S/U grading only. *Prerequisites:* 9 hours of international studies courses and consent of instructor.

**4975. Readings in International Studies.**

**1-3 (Max. 9).** Outlines special programs of readings in international studies to meet the needs of individual students. *Prerequisite:* 9 hours of international studies courses.

**4990. Topics: \_\_\_\_\_.**

**1-6 (Max. 15).** Accommodates seminar series and/or course offerings including those by interdisciplinary teams and visiting faculty in international studies not covered by departmental courses. Dual listed with INST 5990. *Prerequisites:* junior standing and consent of instructor.

**5000. Study Abroad Preparation. 1.**

Prepares students for long-term study in a foreign country. Helps students adapt to and understand the host country: culture, history, geography, political and economic context. Students become familiar with practical information needed for a foreign experience, principles of culture shock, ethnocentrism, cultural relativism, and fundamentals of cross-cultural communication.

**5050. Development, Africa, and Culture.**

**3.** Focuses on the complex and checkered relationships between Western-inspired development and African cultures. Striking a balance among ethnographic case studies, theoretical lenses, and practical implications, understand what Euro-American efforts at foreign development, including contemporary globalization, look like from an African perspective. Provides an understanding of African expectations of development and developers. Dual listed with INST 4050; cross listed with AAST 5050. *Prerequisites:* junior standing and instructor consultation.

**5060. NGOs, Development, and Culture.**

**3.** Non-governmental organizations (NGOs) have grown exponentially in number and are often viewed as the new and best vehicle for international development. Focuses on international non-governmental organizations (INGOs), in contexts of Western aid to post-colonial societies and the role they play in the international aid system. Understand INGOs from historical, global, and cultural perspectives. Dual listed with INST 4060; cross listed with AAST 5060. *Prerequisites:* junior standing and instructor consultation.

**5100. Global Public Health. 4.**

Introduces students to the global context of public health, to principles underlying global health, and to dimensions of public health particular to international settings. It examines major themes and policies in global health and analyzes health problems and varying responses to them in different parts of the world. Cross listed with HLSC 5100, dual listed with INST 4100. *Prerequisite:* upper division or graduate standing.

**5175. Gender, Women and Health. 3.**

Focuses on issues of gender, women and health, including the effects of gender bias in medical research and health care practices and policies. Health care issues of specific concern to women, both nationally and internationally are examined. Dual listed with WMST/NURS 5175; cross listed with WMST/INST/NURS 4175. *Prerequisite:* upper-division standing, lower division social or psychological science course.

**5200. Graduate Proseminar in International Studies. 3-6 (Max. 6).**

Introduces students to different interdisciplinary approaches - perspectives, theories, and paradigms - within International Studies in order to explain the economic, historical, social, cultural, and political dimensions of international processes and issues. Students explore emerging trends in the global system and the most pressing challenges facing states, societies, and peoples. *Prerequisites:* graduate student status.

**5210. Seminar in Human Security. 3-6**

**(Max. 6).** A broad interdisciplinary approach to the study of human security within the field of international studies and global politics in order to explore the theories and processes that explain past and emerging patterns of behavior in the international system, as well as key aspects of local to global policymaking. Dual listed with POLS 5210.

**5220. Graduate Seminar in Development. 3.**

This seminar will explore political challenges facing developing nations in the twenty-first century. The objective is to equip students from a broad range of backgrounds with a

firm grounding in current development approaches and debates. *Prerequisite:* INST graduate standing.

**5240. Global Sex Work and Trafficking.**

**3.** Drawing upon case studies from Africa, Asia, the Americas and Europe, this course explores the gendered intersections of power and privilege through the lens of sex work, broadly defined as the exchange of intimacy for something of value, and trafficking, defined as coerced forms of sex work. Dual listed with INST 4240; cross listed with WMST 5240. *Prerequisite:* 3-6 hours of WMST or INST.

**5250. Economic Development in Asia. 3.**

Designed to explore key issues to the historical development of Asian countries from both comparative and international political economy perspectives. Distinctive political, social, and economic characteristics of these nations will be analyzed. Dual listed with INST 4250. *Prerequisite:* 9 hours of international studies of Asian-focused courses.

**5255. Politics of Developing Nations. 3.** An analysis of the processes of political, economic and social change in the non-Western world. Dual listed with INST 4255; cross listed with POLS 5255. *Prerequisites:* 9 hours of political science or international studies.

**5260. Democratization and Regime Change. 3.** Examines the theoretical/empirical research on causes of democratic transition and consolidation, including new waves of democratization and prospects for democratization in other contexts. Focus is given to a variety of theoretical/methodological perspectives such as the structural, strategic, social/cultural, institutional, and economic approaches. Dual listed with INST 4260; cross listed with POLS 5260. *Prerequisites:* 9 hours of political science or international studies.

**5300. The World System. 3.** Analyzes structure of political and economic interdependence among nation-states. Reviews and assesses theoretical approaches to explaining changing structure of inequality, power, war and peace. Dual listed with INST 4300. Cross listed with POLS/SOC 5300. *Prerequisite:* SOC 1000 or ANTH 1100 or equivalent political science, international studies, or social science course.

**5360. International Peace and Conflict. 3.** Why do nations go to war, engage in atrocities such as genocide, or move toward peace following conflict? Examines underlying processes behind both conflict and peace in the international system, including sources of conflict and ways conflicts might be moved toward sustainable peace. Dual listed with INST 4360; cross listed with POLS 5360. *Prerequisites:* 9 hours of political science or international studies including POLS 2310.

**5375. Transitional Justice. 3.** Mechanisms provide accountability for gross human rights violations and acts of mass atrocity within nations. Case studies are used to examine types of transitional justice interventions; tensions between demands of justice at local, national, and international levels; and transitional justice's role in post-conflict peace-building and reconciliation. Dual listed with INST 4375; cross listed with POLS 5375. *Prerequisites:* 9 hours of political science or international studies including POLS 2310.

**5380. International History of Human Rights. 3.** Examine the modern history of human rights in the global system, with particular emphasis on developments since the Second World War. Topics include the philosophy of human rights ideas; the histories of rights and rights violations in various regions; and the resulting international responses. Dual listed with INST 4380; cross listed with HIST 5380. *Prerequisites:* 9 hours of HIST or INST.

**5400. International Social Science Research Methods. 3.** Introduces students to a wide variety of interdisciplinary social science methodologies that have proven especially conducive to international research. *Prerequisite:* graduate standing.

**5455. Energy Security. 3.** Evaluates the geopolitical and socioeconomic issues surrounding the roots of energy insecurity and the global challenge to provide adequate, affordable, and accessible energy. Topics of study include the questions of energy nationalism, climate security, import dependence and transportation insecurities, the future of fossil fuels and alternative energies. Dual listed with INST 4455. Cross listed with POLS 5455. *Prerequisites:* 9 hours of INST or POLS, including INST/POLS 2310.

**5490. Ethical Trade in Latin America. 3.** Examine the production of everyday products, their socio-ecological contexts, and the complicated global networks of delivery to consumers, particularly with regard to Latin America. The effectiveness and implications of the movement to make international trade more ecologically sustainable and socially just will be examined. Dual listed with INST 4490. *Prerequisites:* 9 hours of international studies or junior status.

**5495. Indigenous Social Movements of Latin America. 3.** Employs an interdisciplinary approach to understanding one of the most interesting political events of the past decades: the emergence of a transnational indigenous people's movement in Latin America. Issues explored in the course include neoliberalism and globalization; social movement theory; multiculturalism and citizenship; legal and

cultural pluralism; sustainability, conservation and development. Dual listed with INST 4495. *Prerequisites:* 9 hours of international studies or junior status.

**5560. Global Cities. 3.** Globalization accelerates urbanization processes and creates a new type of city, the global city. This course introduces debates over global cities, urban culture, new urban landscapes, urban planning practices, and social disparity. It uses case studies on the cities around the world to explore the diversity of global city formation processes. Dual Listed with INST 4560; cross listed with GEOG 5560. *Prerequisites:* 9 hours of international studies or geography.

**5580. Gender, Global Change, and Development. 3.** Examines the global intersections of gender and public policy through its analysis of five central themes: [1] international development discourse in practice; [2] feminized labor and migration; [3] women's unequal access to resources (including land ownership and education); [4] agricultural production and sustainability; [5] health, reproduction and mothering. Dual listed with INST 4580; cross listed with WMST 5580. *Prerequisite:* 3-6 hours of WMST or INST courses.

**5650. Women, Gender & Migration. 3.** From an international context and perspective, this course examines the gendered transformations immigrant women experience. Gender, theories of international migration, assimilation, race, ethnicity, and identity transformation serve as categories of analysis. From a cross-discipline comparative approach, we focus on women's lives to examine differences and similarities to complicate notions of immigration. Cross listed with AMST/CHST/WMST 5650. Dual listed with INST 4650. *Prerequisites:* Junior standing and 6 hours of AMST, CHST, INST, and/or WMST coursework or instructor approval.

**5582. 20th Century U.S. Foreign Relations. 3.** Studies Twentieth Century United States foreign relations with a focus on the Cold War period. Examines economic sources of policy decisions, elites and mass public opinion, as well as cultural, religious, ethnic racial and gender issues. Dual listed with 4582; cross listed with HIST 4582/5582. *Prerequisite:* HIST 1221.

**5590. Sustainable Business Practices. 3.** A close look at what is happening in business practice today through the 'lens' of sustainability. Business models and systems will be discussed and a framework proposed for assessing the ways in which principles of sustainability may be embedded within corporate strategy. Cross listed with MKT 5590; dual listed with INST 4590. *Prerequisite:* advanced business standing.

**5881. International Social Welfare and Social Development. 3.** Examines the basic framework of social welfare analysis and social development programming in the international arena, employing a multinational comparative analysis approach to explore the wide array of responses to social need across the globe. Students employ multinational comparative analyses to an area of social concern. Dual listed with INST 4881; cross listed with SOWK 5881. *Prerequisite:* POLS 1000; ECON 1010 recommended.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrolled in a graduate degree program.

**5970. Internship. 1-12 (Max. 24).** Integrates practical international experience with academic knowledge. Students are expected to participate in specifically assigned tasks and observe broader activities of sponsoring organization, and reflect on experience in written assignments. Dual listed with INST 4970. *Prerequisites:* 9 hours of INST core courses and consent of instructor.

**5975. Graduate Readings in International Studies. 1-3 (Max. 12).** Outlines special programs of readings in international studies to meet the needs of individual students. *Prerequisite:* graduate standing.

**5990. Topics. 1-6 (Max. 15).** Accommodates seminar series and/or course offerings including those by interdisciplinary teams and visiting faculty in International Studies not covered by departmental courses. Dual listed with INST 4990. *Prerequisites:* junior standing and consent of instructor.

## Arabic (ARBC)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

**1010. First Year Arabic I. 4.** Introduces beginning language learners to the Arabic writing system and provides opportunities for developing the four basic language skills (listening, speaking, reading, and writing) at word, phrase and sentence levels.

**1020. First Year Arabic II. 4.** Introduces beginning language learners to the fundamentals of Modern Standard Arabic and provides

opportunities for developing the four basic language skills (listening, speaking, reading, and writing) and practicing them in a variety of academic contexts. *Prerequisite:* ARBC 1010 or LANG 1010.

**2030. Second Year Arabic I. 4.** Aims to help students attain an elementary level of communication in Modern Standard Arabic through emphasis on listening, speaking, reading and writing. Students expand their vocabulary pool, gain a deeper understanding of Arabic language system, and develop their knowledge of Arab culture. *Prerequisite:* ARBC 1020 or LANG 1020.

**2040. Second Year Arabic II. 3.** Aims to help students attain a lower intermediate level of communication in Modern Standard Arabic through emphasis on listening, speaking, reading and writing. Students develop a wider vocabulary pool, gain a deeper understanding of Arabic morphological and grammatical rules, and get acquainted with different aspects of Arab culture. *Prerequisite:* ARBC 2030 or LANG 2030.

**3050. Modern Arabic and its Dialects. 3.** Expose students to a range of Arabic dialects and to explore what relationship these dialects have with the Standard and among each other. Additionally, this course provides students with opportunities to systematically practice and simulate a variety of dialectal excerpts. *Prerequisite:* ARBC 2030 or LANG 2030.

**3060. Arabic Writing. 3. [WB◀▶COM2]** Intensive lower intermediate Arabic writing course will help students develop the skills acquired during the second year through analyzing and producing different text genres ranging from 200 to 500 words. It will move the student from writing letters, dialogs, reports, and summaries to longer narratives, descriptions, and opinion pieces. *Prerequisites:* ARBC 2040 or equivalent.

**4990. Topics in Arabic. 3 (Max. 9).** Accommodates seminar series and/or course offerings including those not provided by permanent course offerings. *Prerequisites:* ARBC 2040 and consent of instructor.

## History

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### Professors:

**RENEE LAEGREID**, B.A. Washington State University 1982; M.A.L.S. Wesleyan University 1994; Ph.D. University of Nebraska 2002; Professor of History 2015, 2012.

**DAVID MESSENGER**, B.A. McGill University 1993; M.A. University of Toronto 1994; Ph.D. 2000; Professor of History and Global and Area Studies 2015, 2006.

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### Associate Professors:

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**MARIANNE R. KAMP**, B.A. Dartmouth College 1985; Ph.D. University of Chicago 1998; Associate Professor of History 2005, 2000.

**JEFFREY D. MEANS**, B.A. Grand Canyon University 1995; M.A. University of Montana 2001; Ph.D. University of Oklahoma 2007; Associate Professor of History 2013, 2007.

**JOANNA POBLETE**, B.A. University of California - Davis 1997; M.A. University of California - Los Angeles 2002; Ph.D. 2006; Associate Professor of History 2015, 2009.

**CHERYL A. WELLS**, B.A.H. Queen's University, Kingston, Ontario, Canada 1995; M.A. University of South Carolina 1998; Ph.D. 2002; Associate Professor of History 2007, 2002.

### Assistant Professor:

**CAROLYNE RYAN LARSON**, B.A. Lawrence University 2004; M.A. University of Wisconsin-Madison 2006; Ph.D. 2011; Assistant Professor of History 2011.

**Academic Professional:**

**BARBARA E. LOGAN**, B.A. Queens College, CUNY 1986; Ph.D. University of California-Santa Cruz 2002; Extended Term Associate Lecturer 2015, 2011.

**Professors Emeriti:**

Cook, Dieterich, Hardy, Kohler, Moore, Williams

The Department of History offers programs leading to the degrees of Bachelor of Arts and Master of Arts.

The study of History at the University of Wyoming provides students with the tools to comprehend the present in order to prepare for the future. Challenging courses are designed to facilitate critical thinking and the development of analytical skills. Each of our courses features the discussion of complex issues, the development of writing and reading skills, and is generally oriented toward promoting individual enrichment. Our liberal arts undergraduate program of study encourages students to work toward a variety of career choices such as public history, archives and museum work, law, education, management, writing, government service, and graduate studies. The ability to develop perspective, render informed judgments, and function as productive citizens of the global community stand as hallmarks of our program.

**Advising**

The Department of History takes advising seriously. Prompt, accurate, and professional advising is a top priority at the University of Wyoming and the Department. To contact an adviser, please contact the department at [uwhistory@uwyo.edu](mailto:uwhistory@uwyo.edu) or go to the web site, [www.uwyo.edu/history](http://www.uwyo.edu/history), or phone (307) 766-5101. Faculty advisers are assigned to all students.

**Pre-Law advising is available.** The American Bar Association encourages a broad base curriculum with an emphasis on critical thinking, communication, and writing skills. The department has advisers available to assist with designing a curriculum to meet pre-law students' needs.

**Undergraduate Major (Effective Fall 2015)**

To complete the Bachelor of Arts degree in history, the student must present at least 36 semester credit hours in history courses or approved substitutions. The courses must be taken for letter grades and a grade of C or better must be earned. Three semesters of credit in the same foreign language is required in

the history major. College and university requirements must be satisfied as well, including Wyoming/U.S. Constitutional requirement that can be satisfied by completing either HIST 1211 or HIST 1221 or HIST 1251. The total hours required is 120.

The history major has considerable leeway in course selection. Most courses taken as a freshman and sophomore are devoted to satisfying general university and the Arts & Sciences college requirements. During the first four semesters students are encouraged to take the 1000-2000 level 2015 University Studies Requirements (USP) as well as the required 12 hours of 1000-2000 level History courses. In junior and senior years, students take HIST 3020, 4030, and 15 hours of 3000-4000 History courses as well as the College of Arts & Sciences Core requirements. Three additional credit hours of history electives are required to total the 36 hours needed for the major.

Because of the flexibility of the History program, history majors are encouraged to choose a minor in consultation with their academic adviser. The minor often can be embedded in the USP requirements and the A&S requirements, and usually does not require additional hours to complete. Additional History courses may not exceed 50 total hours to complete degree requirements. Students are encouraged to work closely with their assigned department adviser in preparing their schedules.

**Learning Outcomes**

It is the goal of the History department that our graduates have the following skills and knowledge:

- Students shall be able to demonstrate thinking skills by analyzing, synthesizing, and evaluating historical information from multiple sources.
- Students will develop the ability to distinguish between fact and fiction while understanding that there is no one historical truth.
- Students will produce well-researched written work that engages with both primary sources and the secondary literature.
- Students will develop an informed familiarity with multiple cultures.
- Students will employ a full range of techniques and methods used to gain historical knowledge.
- Students will develop an ability to convey verbally their historical knowledge.

- Students will demonstrate their understanding of cause and effect along with their knowledge of the general chronology of human experience.

**Undergraduate Minor**

The history minor must take at least 18 semester hours of history courses, 9 hours of which must be at the 3000-4000 level. These courses must be taken for letter grades with a minimum earned grade of C. For assistance in tailoring the minor content, contact the department office.

**Public History Concentration**

Public history designates the areas and careers that involve historical materials used for the general audience. Archives and museum management, historical preservation, historical publishing, planning and consulting on historical topics in public policy or film-making are among the fields covered by public history.

Along with its degree program, the Department of History offers a concentration in public history to students who complete the concentration requirements (18 semester hours). For further information, contact the history department. Completion of a concentration allows listing of the course of study on the student's transcript. Students should declare their intention to pursue the concentration prior to registering for the courses.

**Public History Courses: Effective Spring 2003****PBH REQ1:**

1. Complete HIST 2050, 4050

**PBH INTERN:**

2. Complete 3 hours of HIST 4400

**PBH HIST PRES:**

3. Complete 9 hours in the following areas:
  - Historic Preservation
  - Archives
  - Historical Publishing and Programming
  - Museums and Sites Management

Please see the department web site for a complete list of classes in PBH.

## History/Social Science Education Majors

Through a cooperative agreement with the College of Education, students can now earn concurrent majors in history and secondary education in social sciences. Interested students should inquire with the Office of Teacher Education, McWhinnie Hall, room 100.

## Graduate Study

The History Department offers a Master of Arts (MA) degree.

## Program Specific Admission Requirements

### General Regulations

The Department of History requires 18 hours of undergraduate history courses as minimum preparation for admission. The rules under which the student enters remain those governing the program for the duration of the student's continued enrollment. In accordance with university graduate regulations, students are responsible for meeting all deadlines and for fulfilling all requirements for the degree.

## Application and Admissions

To be eligible for financial support in the form of a Graduate Assistantship, the Department of History must receive all materials by February 1. All other application materials must be received by the Department of History no later than May 1. The application process is now completely online. In addition to the application, applicants must upload the following documents via the UW Admissions website ([www.uwyo.edu/admissions](http://www.uwyo.edu/admissions)):

1. GRE Scores for the verbal and quantitative portions with a minimum combined score of 291 (900 old system) and a minimum verbal score of 153 (500 old system). The Department of History reserves the right to consider the analytical [writing] score as well.
2. Three letters of recommendation that assess the student's academic and research abilities.
3. Transcripts from all undergraduate institutions and graduate programs.
4. A writing sample of 10-20 pages, typically either a portion of a senior thesis or an upper-level seminar paper.

5. A statement of purpose of 250-500 words, explaining the applicant's preparation, interests, and plans. Please indicate on the first line of your statement if you would like to be considered for a graduate assistantship.

## Program Specific Graduate Assistantships

When applicants submit their materials to the Department of History, they should indicate their wish to be considered for a Graduate Assistantship. Anyone receiving financial support must be registered as a full-time (9 hours per semester) student and must be making acceptable progress towards degree completion. Renewal of Graduate Assistantships is contingent on such progress. Support is not given for more than two academic years.

## Program Specific Degree Requirements

### Master's Program

Candidates for the MA in history are required to complete a minimum of 30 hours of course work with at least 24 hours in history. This will include:

1. History 5880, normally in the Fall semester of the first year.
2. 12 hours of history course work in the primary field of history.
3. 6 hours of course work in the secondary field of history.
4. 4 hours of thesis credit.
5. Students must demonstrate a reading knowledge of a foreign language appropriate to their research. Generally, the language requirement may be met by either of the following options:
  - a. Passing a language exam administered by the Department of History.
  - b. Completing the equivalent of the fourth semester of a language as offered at the University of Wyoming. All courses must be passed with a grade of C or better (may be taken pass/fail).

In special cases other relevant historical tools may substitute for the language requirement upon approval of the thesis adviser and the Graduate Coordinator.

6. In the spring semester of the first year, typically in early February, as scheduled by the Department Chair, the student will publicly defend his/her thesis proposal, which must include a written research prospectus and bibliography.
7. The student will successfully defend the final thesis draft before the Graduate Committee.

## History (HIST)

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◆Q]).**

**1010. Introduction to History: Encounters with Difference. 3. [I◆(none)]** Introduces students to history as a discipline with a focus on the ways Americans have understood and dealt with the diverse nature of a society. (Offered based on sufficient demand and resources)

**1110. Western Civilization I. 3. [CH◆(none)]** Surveys basics of Western European civilization from decline of Roman Empire to 1700. (Normally offered fall semester)

**1120. Western Civilization II. 3.** A broad survey of European history in the Western tradition from 1700 to present. (Normally offered spring semester)

**1210. United States History I. 3.** Surveys U.S. history 1607-1865. Together with HIST 1220, it is the foundation on which all U.S. history courses offered by the department are based. Students cannot receive credit for both HIST 1210 and 1211. (Offered each semester)

**1211. U.S. to 1865. 3. [V◆V]** Surveys U.S. history through the Civil War which by itself meets the requirements of the Wyoming statutes providing for instruction in the provisions and principles of the constitutions of the United States and Wyoming. Students cannot receive credit for both HIST 1210 and 1211. (Offered each semester)

**1220. United States History II. 3.** Surveys U.S. history from reconstruction to recent past. Together with HIST 1210, it is the foundation for all U.S. history courses offered by the department. Students cannot receive credit for both HIST 1220 and 1221. (Offered based on sufficient demand and resources)

**1221. U.S. From 1865. 3. [V◆V]** Surveys U.S. history from the Civil War to the present and meets the requirements of the Wyoming statutes providing for instruction in the provisions and principles of the constitutions of

the U.S. and of Wyoming. Students cannot receive credit for both 1220 and 1221. (Offered spring semester and on sufficient demand and resources)

**1250. History of Wyoming. 3.** A study of Wyoming from its beginning to the present. Students cannot receive credit for both HIST 1250 and 1251. (Offered based on sufficient demand and resources)

**1251. Wyoming History. 3. [V◀V]** A survey which encourages an understanding of Wyoming history, how it relates to the history of the West and the rest of America and how it has influenced the present. An important component is to learn about the U.S. and the Wyoming constitutions and how these two documents have influenced Wyoming history. Students cannot receive credit for both HIST 1250 and 1251.

**1290. History of the U.S. West. 3.** An introductory survey of the American West, with consideration of developments in both the 19th and 20th centuries. (Normally offered fall semester)

**1320. World History to 1750. 3. [CS,G◀H]** A history of the world's peoples and societies from human prehistory to 1750, with an emphasis on the diversity and interconnectedness of human life in the past.

**1330. World History since 1750. 3. [CS,G◀(none)]** A history of the world's peoples and societies from 1750 to the present, with an emphasis on the diversity and interconnectedness of human life in the past. Cross listed with INST 1330.

**2020. American Military History. 3.** Surveys military experiences of U.S. from colonial period to the present. In addition to specific wars, examines military doctrines and political, social and economic forces that shaped conduct of war in American history. (Normally offered spring semester)

**2040. Imperial China. 3. [CS,G◀(none)]** Surveys China's social, intellectual, political, cultural, technological and ethnohistory from earliest historical period through the last imperial dynasty, and China's role in greater E. Asian and world history. Provides background for other Asia-related courses, and is part of year-long series; see HIST 2041. *Prerequisite:* 3 hours of history. (Offered based on sufficient demand and resources)

**2041. Modern China. 3.** Surveys China's social, intellectual, political, cultural, and ethnohistory from mid-1800s to the present. Themes include colonialism, emergence of nation-state, Communist party, Mao's socio-political agenda, post-Mao reforms, and China's role in Asia. Background for other Asia-related courses,

and part of year-long series; see HIST 2040. (Offered once every other year). *Prerequisite:* 3 hours in history.

**2050. Introduction to Public History. 3.** Introduces the student to the non-teaching, professional uses of history. Topics for consideration include archival work, museum management, public information and publications, historic site development, oral history interviewing, preparation of government reports, historic preservation general concepts and historical programming. *Prerequisite:* 6 hours of history.

**2060. Topics in History. 2-3 (Max. 6).** Discusses special topics that fall outside traditional chronological and geographical framework of history; content varies from semester to semester in accordance with faculty interest and student demand. (Offered based on sufficient demand and resources)

**2080 [4315]. Holocaust. 3. [CH◀(none)]** Surveys the destruction of European Jewry, 1933-1945. Cross listed with RELI 2080. *Prerequisite:* HIST 1120.

**2105 Medieval Europe in Film. 3.** Historical depictions in films help to shape people's view of the past. Uses commercial films to study major themes in the development of western European civilization between 500 and 1500. Students view, discuss and write about films, learning to evaluate films historically and to view films critically, developing media literacy.

**2120. Ancient Greece and the Near East. 3.** Examines development of civilization in Eastern Mediterranean from prehistory to Alexander the Great. (Normally offered fall semester)

**2130. Ancient Rome. 3.** Studies history of the growth of Roman power from city-state to world power. (Normally offered spring semester)

**2225. History of Christianity. 3.** Traces Christianity from its beginnings to late 20th century. Cross listed with RELI 2225.

**2230. The History of Russia to 1855. 3.** General survey of modern Russian history from earliest times to 1855. (Normally offered fall semester)

**2240. The History of Russia Since 1855. 3.** General survey of modern Russian history from 1855 to the present. (Normally offered spring semester)

**2250. American Religious History I (To 1865). 3. [CH,D◀(none)]** Traces the history of religion in America through the Civil War. We will pay particular attention to the intertwining of religion and colonialism; the tension between emerging Protestant hegemony and religious pluralism; and the roles religion

has played in justifying oppression and pursuing liberty in American history. Cross listed with RELI 2250.

**2252. American Religious History II (1865-1945). 3. [CH,D◀(none)]** Traces American religious history from the Civil War through WWII. Focuses on how race/ethnicity, class, gender, and national origin affected religion, and explores how Americans used religion in oppressing and liberating people; marking and erasing difference; and exporting values abroad as well as reforming society at home. Cross listed with RELI 2252.

**2290. History of North American Indians. 3. [CH,D◀(none)]** Studies American Indian history through 500 years and across the continent. Considers Indian political, social and economic continuity and change. Focuses on how Indian peoples experienced and responded to times of dramatic change. Cross listed with AIST 2290. (Normally offered spring semester)

**2315. History of Non-Western Religions. 3. [CH,G◀(none)]** Introduces students to religions outside the Judeo-Christian realm familiar in the west. Each religion analyzed in its world views, its ways of life, and in its social organization. History of each religion and its changes. Cross listed with RELI 2315.

**2320. History of Islam. 3. [CH,G◀(none)]** Focuses on the origins of Islam and its early formation, its growth and spread across the world, and its intellectual, spiritual and historical character. Time will also be spent on the formation of Islam in the modern world and how that impacts the views and actions of its members.

**2360. African-American History. 3. [CH,D◀COM2]** Surveys African-American history in America, particularly emphasizing issues of identity, class, and progress as well as exploring African-Americans' quest for full participation in American life. Cross listed with AAST 2360. (Offered based on sufficient demand and resources)

**2370. Chicano History: Origins to 1900. 3. [CS,D◀(none)]** General survey of the history of the Mexican American Chicano people in the United States. Examines the origins and development of Mexican Americans, Chicanos through the major historical processes which have shaped their experience. Major themes include multicultural, multiethnic context, origins; changing identity, comparative relations to other social, ethnic groups, culture, social structure, politics, economy, immigration, and the influence of United States-Mexico relations. Cross listed with CHST/GEOG 2370.

**2380. Latin American Civilizations. 3.** [G◀(none)] Provides introduction to Latin American history, from colonial contacts to the present. Explores important themes and connections across the colonial and modern periods, such as race, national identity, foreign involvement, indigenous peoples' role in nation-states, religion, social movements, economic systems, and globalization.

**2385. Chicano History : 1900 to Present. 3.** General survey of the history of the Mexican American Chicano people in the United States. Examines the origins and development of Mexican Americans, Chicanos through the major historical processes which have shaped their experience. Major themes include multi-cultural, multiethnic context, origins; changing identity, comparative relations to other social, ethnic groups, culture, social structure, politics, economy, immigration, and the influence of United States-Mexico relations. Cross listed with CHST 2385.

**2389. History of Women in the American West. 3.** [D◀(none)] Surveys the roots of society's marginal historical depiction of women in the American West from the colonial period through the twentieth century. From the perspective of race, class, ethnicity, and gender, the course focuses on the development of a multi-dimensional understanding of women's roles using an interdisciplinary approach. Cross listed with WMST 2389.

**2460. Traditional Japan. 3.** Surveys Japan's social, intellectual, political, cultural, technological and ethnohistory from earliest historical period to the 1800s. Topics include roles of China and Korea, the samurai warrior tradition, family structure, Buddhism and Shinto. Provides background for other Asia-related courses, and is part of a year-long series; see HIST 2461. *Prerequisite:* 3 hours of history. (Offered once every other year)

**2461. Modern Japan. 3.** Surveys Japan's social, intellectual, political, cultural, economic, technological and ethnohistory from the 1800s through the present. Topics include Japan's industrialization, Asian colonialism, post-WWII, and Japan as economic superpower. Provides background for other Asia-related courses, and is part of a year-long series; see HIST 2460. (Offered once every other year). *Prerequisite:* 3 hours in history.

**2470. Civilization of India. 3-4 (Max. 4).** Surveys Indian civilization from earliest times, including cultural aspects. (Offered based on sufficient demand and resources)

**2500. The Impact of the Union Pacific on Wyoming History. 3.** Students experience and interpret the impact of the building of the Union Pacific Railroad on the history and

culture of Wyoming through the lens of three disciplinary perspectives. Students explore how the railroad impacted Wyoming geography, economic development and the people of the state through personal research projects. Cross listed with ECON 2500.

**2700. Introduction to Museology. 3.** [CH◀(none)] Explores the historical, cultural, and contemporary roles of museums and preservation institutions in society. Introduces students to the museum professions, collection and exhibition installation strategies, and ethical problems of governance and collection. Field trips to regional collections are included. Cross listed with ART/AMST/ANTH 2700. *Prerequisite:* WA.

**3000. Plains Culture and History. 3.** [D◀(none)] An ethnohistorical study of those Native peoples inhabiting the plains region of the U.S. from prehistory to the present. Cross listed with AIST 3000. *Prerequisite:* 3 hours of AIST courses.

**3020 [4020]. Historical Methods. 3.** [WB,L◀(none)] An introduction to the concepts, methods, and techniques used by historians. The main emphasis will be on methods of historical research and analysis, demonstrated through writing. Students will write a number of short papers building skills in various areas of research, analysis, and argumentation, and one longer paper reflecting individual research. Total pages for the semester: 30-45. *Prerequisites:* junior standing, 12 hours in history, and WA. (Offered based on sufficient demand and resources)

**3050. Athenian Democracy. 3.** Examines democratic government in ancient Athens: its origins and development, its practical workings, how politics were conducted and power was gained and exercised, citizen participation, law courts, and evaluations of democracy in the ancient world and since. Cross listed with CLAS 3050. *Prerequisite:* WB.

**3110. Modern Germany. 3.** A cultural, social, and political history of German-Speaking Europe from 1789 to the present. *Prerequisite:* HIST 1120. (Offered every other year)

**3210. The Islamic World in the Premodern Era. 3.** Surveys the rise of Islam as a religion and as a political and cultural system from the time of Muhammad (7<sup>th</sup> century) to the apogee of the Ottoman Empire (17<sup>th</sup> century). Emphasizes the spread of Islam, dynasties and empires, dissenting groups, law and philosophy. *Prerequisite:* 6 hours of history or international studies.

**3220. History of the Modern Middle East. 3.** [G◀(none)] Surveys the Middle East from 1700 to the present. Emphasizes the demise of the Ottoman Empire, the rise of domination

by European colonial powers, transformations in political, social, religious and cultural life, the rise of nationalist movements, the influence of oil, the growth of Islamist political groups and the Israeli-Palestinian conflict. Cross listed with RELI 3220. *Prerequisite:* 6 hours in history, religious studies or international studies.

**3230. Early Christianity. 3.** Considers the development of the Christian religion from a small Jewish sect to its place as the official religion of the Roman Empire and beyond. It examines the development of creeds, doctrines and institutions, placing them within their historical context. *Prerequisite:* RELI 1000, RELI/HIST 2225, or HIST 2113.

**3235. Medieval Christianity. 3.** Traces the development of 'Christendom' in Europe between about 500 - 1500 CE, concentrating on the Latin West. It examines the growth of Christian institutions and practices, the Church's role as sole governing entity, along with conflicts with secular governments as they developed in later centuries. Cross listed with RELI 3235. *Prerequisites:* RELI/HIST 2225, HIST 1110, or RELI 1000.

**3240. Reformation and Enlightenment Christianity. 3.** The years between about 1500 and 1800 saw the permanent dismantling of Christianity in the West as a unified force, as Protestantism brought new ways of viewing the relationship between God and humanity. Once the fragmentation began, it accelerated rapidly as Enlightenment thinking challenged Christianity in new and complex ways. Cross listed with: RELI 3240. *Prerequisites:* RELI 1000, RELI/HIST 2225.

**3275. World Christianities. 3.** [CH,G◀(none)] Examines the development of Christianity primarily in Africa, Asia and South America. Cross listed with RELI 3275. *Prerequisites:* WB and CH.

**3400. Mongol Empire. 3.** Examines the history of the Mongol Empire from a world history perspective. Major themes: structure of a nomadic empire, how that empire interacted with the various settled states it conquered and ramifications of the Mongol conquest on trade, technology, and social and intellectual developments across Eurasia, between the years 1200 to 1450 ce. *Prerequisite:* 6 hours of History.

**3670. African Diaspora. 3.** Examines process through which aspects of African culture have endured in Diaspora. Analyzes social relations between Diaspora Africans and non-African populations in N. and S. America, the Caribbean, Britain, Asia and the Mediterranean. Discusses cultural hybridization as a product of culture contact. Cross listed with AAST 3670. *Prerequisite:* AAST 1000, any AAST 2000-level course, or AAST/HIST 2360.



**3880. Comparative History. 3.** Explores comparative history from a variety of topics, such as colonialism, memory, nationalisms, frontiers, or cultural history. This course will introduce students to at least one of these themes from at least two regions, time periods, or groups of people to understand patterns and change in human societies through time.

*Prerequisite:* completion of WA requirement.

**4000. Indians of Wyoming. 3. [D◀(none)]**

Examines Native American culture in Wyoming from pre-history to the 21st century. Analyzes social, political, and economic developments of Native peoples of Wyoming before, during, and after contact with Europeans. Discusses interaction between these diverse societies and explores the changing relationships between Indians and Euro-Americans through the periods after contact. Cross listed with AIST 4000. *Prerequisite:* 6 hours of HIST or 6 hours of AIST.

**4020. The Black West. 3. [CH,D◀(none)]**

This course explores the historical experiences and contributions of people of African descent to the American West from their earliest recorded presence in the 16th Century through the present. Cross listed with AAST 4020. *Prerequisites:* AAST 1000, any AAST 2000-level course, junior/senior standing, or three hours of any level of HIST course.

**4030. Senior Capstone Seminar. 3 (Max. 6). [WC◀COM3]**

For undergraduate departmental majors; presented in a small group, non-lecture setting. Under close instructor supervision, students write reviews and essays, present critiques and oral reports and lead discussion on materials read by class. *Prerequisite:* advanced standing as a History major and HIST 3020; or advanced standing as History/SSSE concurrent major and either HIST 3020 or HIST 4055. (Offered based on sufficient demand and resources)

**4050. Advanced Public History. 2-3 (Max. 6).**

Reading and practice in non-teaching professional uses of the discipline of history. Topics for consideration may include museum curatorial exercises, museum and historic site management, historical editing and publishing, programming for museums and other agencies dealing with history, site interpretation and preservation and private practice of public history. *Prerequisites:* HIST 2050, 6 hours of history courses, consent of instructor. (Offered based on sufficient demand and resources)

**4055. Archival Research Methods. 3.** Students will master advanced research strategies with interdisciplinary applications. Focuses on primary research and the development of advanced skills in information literacy, critical analysis of sources, verification of evidence,

techniques for researching underdocumented populations, and interpretation of historical evidence. Advanced writing and oral presentation skills are emphasized. Dual listed with HIST 5055. *Prerequisite:* HIST 2050.

**4060. Independent Study. 1-3 (Max. 6).**

Credit not to exceed 6 hours maximum, to be arranged in either European or American history. Primarily for juniors and seniors who can profit from independent work with minimal supervision. *Prerequisites:* 12 semester hours in history; written permission of instructor required. (Offered fall, spring and summer)

**4075. Book History: Manuscripts. 3.** Books in handwritten form are studied within their historical contexts: Mesopotamian and Indus Valley tablets; Egyptian, Greek, Roman, Jewish, Chinese, and Japanese scrolls; Early Christian, Medieval, Renaissance, Jewish, Islamic, Mayan, and Aztec codex manuscripts. Taught at the Rare Books Library, American Heritage Center, with manuscript facsimiles used as visual aides. *Prerequisites:* junior standing and 6 hours of history.

**4076. Book History: Printed. 3.** Printed books from their original start in China, through Gutenberg's "printing revolution" in Europe, and on up to the present are studied within their historical contexts. All class sessions will utilize original books from the fifteenth through twenty-first centuries held at the University's Rare Books Library, American Heritage Center. *Prerequisites:* junior standing and 6 hours of history.

**4077. Book History: Topics. 3 (Max. 6).** An in-depth, hands-on study of books within their historical contexts. The topic will vary each time and focus on a particular theme, time period, place, or culture. Taught at the Rare Books Library, American Heritage Center, using original books or facsimiles. May be repeated once for credit. Dual listed with HIST 5077. *Prerequisites:* junior standing, 6 hours of history (preferably with at least one of the other Book History courses).

**4100. Early Medieval Europe. 3.** Studies development of European civilization from decline of Rome to 12th century. Dual listed with HIST 5100. *Prerequisite:* HIST 1110. (Normally offered fall semester)

**4110. The High Middle Ages. 3.** Studies history of European civilization between the 12th and 15th centuries. Dual listed with HIST 5110. *Prerequisite:* HIST 1110 or 4100.

**4112. History of the Medieval City. 3.** After the fall of the Western Roman Empire, cities virtually disappeared from Western Europe. Around 1000 Europe began its rise to world prominence and cities contributed to that rise. Examines development of cities in medieval

Europe and explores life within those cities. Dual listed with HIST 5112. *Prerequisite:* HIST 1110, 2100, 4100 or 4110.

**4113. Medieval Religious Dissent. 3.** Religious dissent in the Middle Ages included what some would call heresy, but also encompasses such marginal groups as Jews and witches. Examines development of orthodoxy and persecution of religious diversity between eleventh and 16th centuries within the historical context of the times. Dual listed with HIST 5113. Cross listed with RELI 4113. *Prerequisite:* HIST 1110, 4100, 4110 or 2225.

**4120. Europe During the Renaissance. 3.** Intensely studies European history in 14th and 15th centuries. *Prerequisite:* HIST 1110 or 2100. (Offered fall semester of even-numbered years)

**4130. Europe During the Reformation. 3.** Intensely studies European history in the 16th century. *Prerequisite:* HIST 1110 or 2100. (Offered spring semester of odd-numbered years)

**4140. Europe During the Age of the Baroque. 3.** Intensely studies European history in 17th century. *Prerequisite:* HIST 1110. (Offered fall semester of odd-numbered years)

**4150. Europe During the Age of the Enlightenment. 3.** Intensely studies European history in 18th century. *Prerequisite:* HIST 1120. (Offered spring semester of even-numbered years)

**4170. Europe in the Nineteenth Century. 3.** An intensive study of European history from the beginning of the nineteenth century through to the origins of the First World War in 1914. Dual listed with HIST 5170. *Prerequisite:* HIST 1120. (Offered based on sufficient demand and resources)

**4174. Judaism from Ezra to Jesus. 3.** This course focuses on the religious and historical development of Judaism during the centuries between the end of the Old Testament and the New Testament, studying the arrival of Greek and then Roman culture and the changes Judaism underwent during that time that endure today. Cross listed with RELI 4174. *Prerequisites:* WB or COM2, and RELI 1000 or RELI 2110.

**4175. Judaism at the Dawn of Christianity. 3.** Judaism is the only Mediterranean religion that was practiced in the ancient world as well as in Late Antiquity and beyond. This course helps students analyze how Judaism was able to change and adapt at key moments to provide its adherents with an active, living religion that addressed their needs. Cross listed with RELI 4175. *Prerequisites:* RELI 1000 or RELI 2110, and junior standing.

**4180. Europe in the 20th Century. 3.** An intensive study of European history from 1914 through 2000. Dual listed with HIST 5180. *Prerequisite:* HIST 1120 or 1330 or consent of the instructor.

**4195. European Economic History. 3.** History of European economies from the Renaissance through the Industrial Revolution of the 19th century. Focuses on the diverging paths of different economies in Europe, the role of agriculture in economic development, and the causes and nature of the Industrial Revolution. Dual listed with HIST 5195. *Prerequisite:* HIST 1120.

**4270. France: Old Regime and Revolution. 3.** The social, political and cultural history of early modern France (1598-1789), from the rise of the Absolutist state under Louis XIV to the outbreak of the Revolution. Explores the cultural and intellectual shifts from court culture at Versailles, to the Enlightenment, to the rise of revolutionary ideologies. Dual listed with HIST 5270. *Prerequisite:* HIST 1110.

**4280. France Since 1814. 3.** Encompasses the history of the political, social, economic, intellectual, ecclesiastical and military conflicts which shaped modern France. Dual listed with HIST 5280. *Prerequisite:* HIST 1120. (Offered based on sufficient demand and resources)

**4290. History of the Soviet Union. 3.** Depicts Russia under Communism, including particularly the development of totalitarian dictatorship in its political, economic, social and cultural manifestations. Dual listed with HIST 5290. *Prerequisite:* HIST 1110, 1120. (Offered based on sufficient demand and resources)

**4305. Global History. 3. [G◀(none)]** Thematically focused examinations of interactions or parallel phenomena in multiple world regions. Courses may be comparative (comparing two empires, or multiple revolutions), or may examine the growth of a particular trend globally (e.g. abolition of slavery), or the interaction of many states (e.g. the Cold War). Dual listed with HIST 5305. *Prerequisites:* Six credits of coursework in HStory, Global and Area Studies, or Political Science.

**4310. World War II in Europe. 3.** Covers the origins, course and consequences of one of this century's defining global developments. World War II in Europe was a transnational development which shaped the world as it is known today. Dual listed with HIST 5310. *Prerequisites:* HIST 1110 and 1120.

**4315. Central Europe and the Holocaust. 3.** Offers students the opportunity to learn about the history of the Holocaust through travel to various sites in Central Europe where the events themselves occurred, such as Berlin,

Warsaw, Krakow and Auschwitz-Birkenau. Dual listed with HIST 5315. *Prerequisite:* HIST 1120.

**4320. Memory and National Identity in Twentieth Century Europe. 3.** Europe in the twentieth century saw a century of unprecedented violence. Examines the public representation of such historical trauma through the concept of "collective memory" and focuses in particular on how memory has become a contested part of defining identity in modern-day Europe. Dual listed with HIST 5320. *Prerequisite:* HIST 1110.

**4325. Sites of Memory: Berlin and Budapest. 1.** Europe in the twentieth century saw a century of unprecedented violence. This class travels to Berlin, Germany and Budapest, Hungary over Spring Break to examine how these events have been remembered in museums and memorials. Recommended for students enrolled in HIST 4320, Memory and National Identity in Twentieth Century Europe. Dual listed with HIST 5325. *Prerequisite:* consent of instructor. Additional costs for travel and accommodation.

**4330. European Gender and Women's History. 3.** The experiences of women and the history of gender from the Renaissance through the 19th century. Focuses on the changing notions of the masculine and the feminine through such historical episodes as the Reformation, the Enlightenment, the French Revolution and the Industrial Revolution. Dual listed with HIST 5330. *Prerequisite:* HIST 1110.

**4335. Women and Islam. 3.** Examines women's lives in Islamic societies from the seventh century to the present in the Middle East and throughout the world. Themes include women's position in Islamic law, society and culture, Western images of Muslim women, veiling and Islamist movements, theoretical readings on power, gender and agency. Cross listed with RELI 4335 and WMST 4335, dual listed with HIST 5335. *Prerequisite:* 6 hours in women's studies, international studies, religious studies, or history.

**4340 [4840]. The Social History of American Women. 3. [(none)▶H]** Explores everyday life experiences of American women from the 17th century to the present. Focuses on the complex influence of gender, race and class in shaping those experiences; also, analyzes the ways in which women's dissatisfaction with their position in society formed the basis for the development of American feminism and led to the formation of an organized women's movement. Dual listed with HIST 5340. *Prerequisite:* ENGL./WMST/SOC 1080, HIST 1210/1211, 1220/1221.

**4380. International History of Human Rights. 3.** Examine the modern history of human rights in the global system, with particular emphasis on developments since the Second World War. Topics include the philosophy of human rights ideas; the histories of rights and rights violations in various regions; and the resulting international responses. Dual listed with HIST 5380; cross listed with INST 4380. *Prerequisites:* 9 hours of HIST or INST.

**4400. Internship. 1-12 (Max. 12).** The internship allows students to gain hands-on experience that will help to bridge the gap between history as an academic discipline and history as practiced in museums, public history agencies and historic sites. Specific arrangements must be made in advance to identify the academic component of the internship and the grading criteria. Such planning will be done in consultation with the department's internship director. *Prerequisites:* 12 hours of history; completion of HIST 1210/1211 and 1220/1221, 1250/1251 and 4050 or advanced standing as a history major; consent of instructor.

**4405. American Encounters to 1850. 3. [D▶H]** The history of America as a history of continuous encounters. Examines the history of the American people by focusing on a series of critical encounters between Native American, European, African and Asian people from pre-contact through the mid-19th century. Dual listed with HIST 5405. *Prerequisite:* HIST 1210/1211 or consent of instructor.

**4406. American Encounters from 1850. 3. [D▶H]** The history of America as a history of continuous encounters. Examines the history of the American people by focusing on a series of critical encounters between Native American, European, African, and Asian people from the mid-19th century to the present. *Prerequisite:* HIST 1210/1211.

**4410. America in an Early Modern World. 3. [CS,G▶H]** Explores the American colonial experience as part of a worldwide process of colonial encounters with indigenous peoples between 1400 and 1800. Compares the experiences of early modern colonization in North and South America, Asia, and the Pacific and examines the nature of the colonial societies created by these cross-cultural relationships. Dual listed with HIST 5410. *Prerequisite:* An American or World History course.

**4415. Entangled Worlds, Entangled Lives: Indigenous People and Colonizers Before 1850. 3. [CS, G▶H]** The experiences of indigenous people and colonizers in Africa, Eurasia, the Americas, and the Pacific as they forged new colonial societies in the first global age (1400-1850). Emphasis throughout the course will be on the often-overlooked role of indig-

enous people in creating colonial societies. Dual listed with HIST 5415. *Prerequisite:* WA with a grade of C or above.

**4440. The Sectional Conflict. 3.** Topically examines differences, north and south, which had crystallized by 1850 into competing institutions and ideologies. Includes Jacksonian party ethos, world of slavery, divisive aspects of territorial expansion and social and economic tensions which attended America's burgeoning free-market system. Dual listed with HIST 5440. *Prerequisite:* HIST 1210/1211. (Offered based on sufficient demand and resources)

**4450. The Civil War and Reconstruction. 3.** Studies crisis of the Union, 1861- 1877. Examines experiences of both the North and South during the Civil War and restoration of the Union after the war. Dual listed with HIST 5450. *Prerequisites:* HIST 1210/1211 and 1220/1221. (Offered based on sufficient demand and resources)

**4460. Post-Civil War America: The Gilded Age. 3.** Intensively covers economic, cultural and political developments which marked the U.S. in post-Civil War era, such as rise of industry, emergence of distinctive national culture and party struggles shaping America's Gilded Age. Dual listed with HIST 5460. *Prerequisites:* HIST 1210/1211 and 1220/1221. (Offered based on sufficient demand and resources)

**4462. American Indian History to 1783. 3.** Surveys the history of American Indians from the period before contact to the end of the American Revolution. Examines the various contacts between American Indians and Europeans and considers what the American Revolution meant to the continent's Native peoples. Dual listed with HIST 5462; cross listed with AIST 4462. *Prerequisite:* HIST/AIST 2290.

**4463. American Indian History 1783-1890. 3.** Surveys the history of American Indians during the era of westward expansion. Examines the impact of American westward movement and also the manifold changes that accompanied moving west. Dual listed with HIST 5463; cross listed with AIST 4463. *Prerequisite:* HIST/AIST 2290.

**4464. American Indians in the Twentieth Century. 3.** Surveys the history of American Indians during the twentieth century. Examines the development of new cultural, social and political forms that help create an American Indian identity. Dual listed with HIST 5464; cross listed with AIST 4464. *Prerequisite:* HIST/AIST 2290.

**4465 [4650]. Topics in American Indian History. 3.** Provides topical approach to American Indian history. Through extensive

readings and thorough class discussion, students build on previous course work in the field. Features best recent studies on American Indians in 19th and 20th centuries. Limited enrollment. Dual listed with HIST 5465. *Prerequisites:* HIST 2290 and consent of instructor. (Offered based on sufficient demand and resources)

**4466. American Indian Ethnohistory. 3.** Surveys ethnohistorical methods and concepts and provides students concrete opportunities to use these methodologies in writing exercises. American Indian ethnohistory explores Native American experiences within their own cultural contexts. Cross listed with AIST 4466. Dual listed with HIST 5466. *Prerequisite:* ANTH 2210/AIST 2210 or HIST 2290/AIST 2290.

**4468. American Indians in the North American West. 3.** One of the defining features of the North American West is the presence of American Indians. Through the discussion of varied readings and primary document research, the history of American Indians in the West is examined, with particular emphasis on the Great Plains and California. Cross listed with AIST 4468; dual listed with HIST 5468. *Prerequisite:* HIST/AIST 2290.

**4470. The Birth of Modern America, 1890-1929. 3.** Studies political and diplomatic developments in the U.S. in the wake of industrialization and massive immigration. Some attention to cultural and social themes. Emphasizes shifting nature of reform between depression of the 1890s and that of the 1930s. Dual listed with HIST 5470. *Prerequisites:* HIST 1210/1211 and 1220/1221. (Normally offered every third fall semester)

**4475 [4670]. American Environmental History. 3.** Explores history of American attitudes and actions toward the land and natural resources. Dual listed with HIST 5475. *Prerequisite:* 6 hours of history. (Offered every fourth semester)

**4480. Growth of Modern America, 1929-1960. 3.** Studies political and diplomatic developments in the U.S. in Depression, World War II and early Cold War periods. Some attention to cultural and social themes. Emphasizes economic crisis, growth of government, reform traditions, anti-communism and civil rights. Dual listed with HIST 5480. *Prerequisites:* HIST 1210/1211 and 1220/1221. (Normally offered every third semester)

**4485. U.S. Latino Diaspora. 3.** Combines classroom activities and a week-long stay abroad in examining the historical creation and contemporary spread of the Latino Diaspora from the Caribbean to the Yucatan and beyond. U.S. Latina/o history, multiculturalism,

pan-Latino identity, assimilation, migration trends and natives responses are stressed. Cross listed with CHST/INST 4485. *Prerequisite:* 9 hours of CHST, HIST, and/or INST related coursework.

**4490. Modern America, 1960-Present. 3.** Studies political and diplomatic aspects of the U.S. since 1960. Emphasizes impact of Cold War, social and political tensions at home, civil rights and government policies. Dual listed with HIST 5490. *Prerequisites:* HIST 1210/1211 and 1220/1221. (Normally offered every third semester)

**4492. Revolutions in Latin America. 3. [CS,G♦(none)]** Explores the meaning and impact of revolution in Latin America's modern history, focusing on political ideology, cultural expression, foreign relations, human rights, and globalization. Offers in-depth analysis of revolutions from the early nineteenth century to the present. Cross listed with CHST 4492; dual listed with HIST 5492. *Prerequisite:* 3 hours of relevant course work in HIST (e.g., 2290, 2380, 4495, 4496).

**4495 [4720]. Borderlands in Latin America. 3.** Examines borderlands and frontiers in Latin American history, focusing on the U.S.-Mexico border region, the Southern Cone, and the Caribbean. Key issues include cultural contact zones, colonialism, military expansion and conflict, and nation-building. Dual listed with HIST 5495.

**4496 [4800]. History of Mexico. 3.** Intensive course in Mexican development. Emphasizes the 20th century especially the Mexican Revolution of 1910, showing how this nation transformed itself into a modern nation-state. Includes diplomatic relations with the U.S., incorporation of Indians, church-state relations, uses of land and other natural resources, role of the military and growth of Mexican nationalism. Cross listed with CHST 4496. Dual listed with HIST 5496. *Prerequisite:* HIST 2380. (Normally offered fall semester)

**4505 [4500]. The Old South, 1820-1861. 3.** Studies history of the South from emergence of southern identity to the Civil War. Emphasizes southern society and culture. Dual listed with HIST 5505. *Prerequisite:* HIST 1210/1211. (Offered based on sufficient demand and resources)

**4510 [4950]. Modern East Asia. 3.** Focuses on the emergence of the modern East Asian states China, Japan, Korea and Vietnam as individual states and members of this important region historically and in contemporary era, understanding the emergence of those states as responses to internal forces and external pressures such as imperialism, nationalism, Com-

munism and Capitalism. Dual listed with HIST 5510. *Prerequisite:* 6 hours of history. (Offered based on sufficient demand and resources)

**4515 [4710]. American Legal History. 3.** An intensive course in the history of American law, the judicial system, the legal profession and legal administration from colonial times to the present. Dual listed with HIST 5515. *Prerequisite:* HIST 1210/1211, 1220/1221 and/or consent of instructor. (Offered in spring semester of even-numbered years)

**4525 [4700]. American Southwest. 3.** Explores the Southwest as the location of cultural encounters and conflicts. Focuses on the cross-cultural interchange between American Indians, Mexican Americans and Anglo Americans from the fifteenth century to the present. Dual listed with HIST 5525; cross listed with CHST/AIST 4525. *Prerequisites:* HIST 1210/1211 and 1220/1221. (Normally offered spring semester)

**4530 [4630]. 19th Century American West. 3.** A study of the westward movement with emphasis on the trans-Mississippi West. Dual listed with HIST 5530. *Prerequisites:* HIST 1210/1211 and 1220/1221. (Normally offered fall semester)

**4535. History of Oil. 3.** Intensive study of the history of oil development throughout the world. Emphasizes comparative studies of the industry as it developed in various parts of the world and during various time periods, from pre-historic times to the present. The Wyoming oil/energy mineral history is an important component. Dual listed with HIST 5535. *Prerequisite:* 6 hours in history.

**4540 [4640]. 20th Century American West. 3.** A study of the modern American West, with consideration of social, economic and political continuity and change. Dual listed with HIST 5540. *Prerequisites:* HIST 1210/1211 and 1220/1221. (Normally offered spring semester)

**4545. The Multicultural West. 3.** Explores the American West as a meeting ground of diverse peoples and their diverse cultures. Focuses on the sustained cross-cultural interchange between Native Americans, Euro-Americans, African Americans, Latin Americans, and Asian Americans from trans-Appalachia to the Pacific Coast from the eighteenth century to the present. Dual listed with HIST 5545. *Prerequisite:* Any history or social science course.

**4546. Agriculture: Rooted in Diversity. 3. [C,D] (none)** Addresses multiple themes related to diversity in agriculture with the goal of making visible the experiences of minorities and women in agriculture. Involves significant independent research, class discussion, project development, and development of oral and written communication skills. Establishes link-

ages with supporting disciplines. Cross listed with AGRI/AIST/CHST/ENGL/FCSC/AMST 4546. *Prerequisites:* junior class standing or consent of instructor and concurrent enrollment or major in any of the following: ethnic studies, agriculture, American studies, anthropology, English, history, sociology, or women's studies.

**4560. American Social History in the 20th Century. 3.** Explores history of social mobility and conflict in 20th century. Emphasizes impact of industrialization, rapid urbanization, massive immigration, ethnic minorities, race, religion, women and the family, painting and architecture. Dual listed with HIST 5560. *Prerequisites:* HIST 1210/1211 and 1220/1221. (Offered every fourth semester)

**4582. 20th Century U.S. Foreign Relations. 3.** Studies Twentieth Century United States foreign relations with a focus on the Cold War period. Examines economic sources of policy decisions, elites and mass public opinion, as well as cultural, religious, ethnic, racial, and gender issues. Cross listed with INST 4582; dual listed with HIST 5582. *Prerequisite:* HIST 1221.

**4585 [4680]. Conference on U. S. History. 1-3 (Max. 6).** Reading and writing course. Allows advanced students to investigate shifting ideas about important topics in 20th century American history. Primary focus varies from semester to semester, but will be designated in the class schedule. Dual listed with HIST 5585. *Prerequisite:* 6 hours of American history. (Offered based on sufficient demand and resources)

**4610. Seminar Topics in the History of Wyoming I. 3.** An intensive research and writing course dealing with topics in the period before statehood in 1890. *Prerequisite:* HIST 1250/1251. (Offered based on sufficient demand and resources)

**4620. Seminar Topics in the History of Wyoming II. 3.** Allows students to do intensive research and writing dealing with topics in Wyoming history from 1890 to present. *Prerequisite:* HIST 1250/1251. (Offered based on sufficient demand and resources)

**4665. History and Philosophy of American Education. 3.** Provides cultural, philosophical, and historical perspectives drawn from the American experience and centered in the American ideology of equality of educational opportunity. Major trends and philosophies that have developed, and are developing, in American education will be shared through discussion, presentations, and written projects. Dual Listed with HIST 5665. Cross listed with EDCI 4665. *Prerequisite:* Completion of WA with C or better.

**4690. Research Topics in History. 1-4 (Max. 6).** Provides opportunity for undergraduate research in selected topics in History. *Prerequisites:* 18 credit hours of History coursework and consent of instructor. (Offered based on sufficient demand and resources)

**4965. Senior Thesis. 3.** Working closely with a faculty advisor, a history major will develop a research proposal that, after approval by the History department faculty, will lead to in-depth research and writing, producing a minimum 50-page thesis that demonstrates an excellent grasp of historical methods and a high degree of writing skill. *Prerequisites:* History major, junior or senior standing, 24 credits of History courses, faculty nomination, and a minimum 3.7 History GPA.

**4990 [4080]. Topics in \_\_\_\_\_. 1-6 (Max. 12).** Affords students opportunity to study in-depth various topics in history not offered in regular courses or independent study. *Prerequisite:* 6 hours of history. (Offered based on sufficient demand and resources)

**5000. Indians of Wyoming. 3.** Examines Native American culture in Wyoming from pre-history to the 21st century. Analyzes social, political, and economic developments of Native peoples of Wyoming before, during, and after contact with Europeans. Discusses interaction between these diverse societies and explores the changing relationships between Indians and Euro-Americans through the periods after contact. Dual listed with HIST 4000; cross listed with AIST 4000. *Prerequisite:* 6 hours of HIST or AIST.

**5055. Archival Research Methods. 3.** Students master advanced research strategies with interdisciplinary applications. Focuses on primary document research and the development of advanced skills in information literacy, critical analysis of sources, verification of evidence, techniques for researching under-documented populations, and interpretation of historical evidence. Advanced writing and oral presentation skills are emphasized. *Prerequisite:* HIST 2050.

**5070. History of Books. 3.** A chronological survey traces written communication from the ancient world to the present. Within this historical framework, various topics that cross-cut tie periods and countries are explained. A substantial part of the class includes hands-on experience with rare books at the American Heritage Center. *Prerequisites:* 6 hours of history and junior standing.

**5075. Book History: Manuscripts. 3.** Books in handwritten form are studied within their historical contexts: Mesopotamian and Indus Valley tablets; Egyptian, Greek, Roman, Jewish, Chinese, and Japanese scrolls; Early Chris-

tian, Medieval, Renaissance, Jewish, Islamic, Mayan, and Aztec codex manuscripts. Taught at the Rare Books Library, American Heritage Center, with manuscript facsimiles used as visual aids. *Prerequisites:* junior standing and 6 hours of history.

**5076. Book History: Printed. 3.** Printed books from their original start in China, through Gutenberg's printing revolution in Europe, and on up to the present are studied within their historical contexts. All class sessions will utilize original books from the fifteenth through twenty-first centuries held at the University's Rare Books Library, American Heritage Center. *Prerequisites:* junior standing and 6 hours of history.

**5077. Book History: Topics. 3.** An in-depth, hands on study of books within their historical contexts. The topic varies each time, and focuses on a particular theme, time period, place, or culture. Taught at the Rare Books Library, American Heritage Center, using original books or facsimiles. May be repeated once for credit. *Prerequisites:* junior standing, or 6 hours of history (preferably with at least one of the other Book History courses).

**5100. Early Medieval Europe. 3.** The study of the development of European civilization from the decline of Rome to the twelfth century. Dual listed with HIST 4100. *Prerequisite:* HIST 1110.

**5110. The High Middle Ages. 3.** Studies history of European civilization between the 12th and 15th centuries. Dual listed with HIST 4100. *Prerequisite:* HIST 1110.

**5112. History of the Medieval City. 3.** After the fall of the Western Roman Empire, cities virtually disappeared from Western Europe. Around 1000, Europe began its rise to world prominence, and the birth of the cities contributed to that rise. This course examines the development of cities in medieval Europe and explores life within those cities. Dual listed with HIST 4112. *Prerequisite:* HIST 1110, 4100, or 4110.

**5113. Medieval Religious Dissent. 3.** Religious dissent in the Middle Ages included what we would call heresy, but also encompasses such marginal groups as Jews and witches. This course examines development of orthodoxy and the persecution of religious diversity between the 11th and 16th centuries. It also studies the historical context of the times. Dual listed with HIST 4113; cross listed with RELI 4113. *Prerequisite:* HIST 1110, 4100, or 4110.

**5170. Europe in the 19th Century. 3.** An intensive study of European history from the beginning of the nineteenth century through

to the origins of the First World War in 1914. Dual listed with HIST 4170. *Prerequisite:* HIST 1120.

**5180. Europe in the 20th Century. 3.** An intensive study of European history from 1914 through 2000. Dual listed with HIST 4180. *Prerequisite:* HIST 1120 or 1330 or consent of instructor.

**5195. European Economic History. 3.** The history of European economies from the Renaissance through the Industrial Revolution of the nineteenth century. Focuses on the diverging paths of different economies in Europe, the role of agriculture in economic development, and the causes and nature of the Industrial Revolution. Dual listed with HIST 4195. *Prerequisite:* HIST 1110.

**5270. France: Old Regime and Revolution. 3.** The social, political and cultural history of early modern France (1598-1789), from the rise of the Absolutist state under Louis XIV to the outbreak of the Revolution. Explores the cultural and intellectual shifts from court culture at Versailles, to the Enlightenment, to the rise of revolutionary ideologies. *Prerequisite:* HIST 1110.

**5280. France Since 1814. 3.** History of the political, social, economic, intellectual, ecclesiastical, and military conflicts which shaped modern France. Dual listed with HIST 4280. *Prerequisite:* HIST 1120, or HIST 1210.

**5290. History of the Soviet Union. 3.** Russia under Communism, including particularly the development of totalitarian dictatorship in its political, economic, social, and cultural manifestations. Dual listed with HIST 4290. *Prerequisite:* HIST 1110 and 1120.

**5305. Global History. 3.** Thematically focused examinations of interactions or parallel phenomena in multiple world regions. Courses may be comparative (comparing two empires, or multiple revolutions), or may examine the growth of a particular trend globally (e.g. abolition of slavery), or the interaction of many states (e.g. the Cold War). Dual listed with HIST 4305. *Prerequisite:* graduate student standing.

**5310. World War II in Europe. 3.** Covers the origins, course, and consequences of one of this century's defining global developments. World War II in Europe was a transnational development which shaped the world as we know it today. Dual listed with HIST 4310. *Prerequisites:* HIST 1110 and 1120.

**5315. Central Europe and the Holocaust. 3.** Offers students the opportunity to learn about the history of the Holocaust as they visit various sites in Central Europe where the events

themselves occurred, such as Berlin, Warsaw, Krakow and Auschwitz-Birkenau. Dual listed with HIST 4315. *Prerequisite:* HIST 1120.

**5320. Memory and National Identity in 20th Century Europe. 3.** Europe in the twentieth century saw a century of unprecedented violence. Examines the public representation of such historical trauma through the concept of "collective memory" and focuses in particular on how memory has become a contested part of defining national identity in modern-day Europe. *Prerequisite:* HIST 1120.

**5325. Sites of Memory: Berlin and Budapest. 1.** Europe in the twentieth century saw a century of unprecedented violence. This class travels to Berlin, German and Budapest, Hungary over Spring Break to examine how these events have been remembered in museums and memorials. Recommended for students enrolled in HIST 4320. "Memory and National Identity in Twentieth Century Europe". Additional costs for travel and accommodations. *Prerequisites:* consent of instructor.

**5330. European Gender History. 3.** The experiences of women and the history of gender from the Renaissance through the nineteenth century. Focuses on the changing notions of the masculine and the feminine through such historical episodes as the Reformation, the Enlightenment, the French Revolution and the Industrial Revolution. Dual listed with HIST 4530; cross listed with WMST 5330. *Prerequisite:* HIST 1110.

**5335. Women and Islam. 3.** Examines women's lives in Islamic societies from the seventh century to the present in the Middle East and throughout the world. Themes include women's position in Islamic law, society and culture, Western images of Muslim women, veiling and Islamist movements, theoretical readings on power, gender and agency. Cross listed with WMST 5335, dual listed with HIST 4335. *Prerequisite:* 6 hours in women's studies, international studies, religious studies, or history.

**5340. The Social History of American Women. 3.** Explores the everyday life experiences of American women from the seventeenth century to the present with a focus on the complex influence of gender, race, and class in shaping those experiences. The course then turns to an analysis of the ways in which woman's dissatisfaction with the position in society formed American feminism and lead to the formation or an organized women's movement. Dual listed with HIST 4340. *Prerequisites:* ENGL/WMST/SOC 1080, HIST 1210/1211, 1220/1221.

**5380. International History of Human Rights. 3.** Examine the modern history of human rights in the global system, with particular emphasis on developments since the Second World War. Topics include the philosophy of human rights ideas; the histories of rights and rights violations in various regions; and the resulting international responses. Dual listed with HIST 4380; cross listed with INST 5380. *Prerequisites:* 9 hours of HIST or INST.

**5381. Seminar in Recent United States History. 3 (Max. 12).**

**5400. Graduate Topics in History. 1-6 (Max. 12).** Opportunity to study in-depth various topics in history not offered in regular graduate seminars or graduate reading courses. *Prerequisite:* graduate standing.

**5405. American Encounters to 1850. 3.** The history of America as a history of continuous encounters. Examines the history of the American people by focusing on a series of critical encounters between Native American, European, African, and Asian people from pre-contact to the mid-19th century. *Prerequisite:* HIST 1210/1211.

**5406. American Encounters from 1850. 3.** The history of America as a history of continuous encounters. Examines the history of the American people by focusing on a series of critical encounters between Native American, European, African, and Asian people from the mid-19th century to the present. Dual listed with HIST 4406. *Prerequisite:* HIST 1210/1211.

**5410. America in an Early Modern World. 3.** Explores the American colonial experience as part of a worldwide process of colonial encounters with indigenous peoples between 1400 and 1800. Compares the experiences of early modern colonization in North and South America, Asia, and the Pacific and examines the nature of the colonial societies created by these cross-cultural relationships. Dual Listed with HIST 4410. *Prerequisite:* An American or World History course.

**5415. Entangled Worlds, Entangled Lives: Indigenous People and Colonizers Before 1850. 3.** The experiences of indigenous people and colonizers in Africa, Eurasia, the Americas, and the Pacific as they forged new colonial societies in the first global age (1400-1850). Emphasis through the course will be on the often-overlooked role of indigenous people in creating colonial societies. Dual listed with HIST 4415.

**5440. The Sectional Conflict. 3.** Topically examines differences, north and south, which had crystallized by 1850 into competing institutions and ideologies. Includes Jacksonian party ethos, the world of slavery, the divisive aspects of territorial expansion and social and

economic tensions which attended America's burgeoning free-market system. Dual listed with HIST 4440. *Prerequisite:* HIST 1210.

**5450. The Civil War and Reconstruction. 3.** A study of the crisis of the Union, 1861-1877. Examination of the experiences of both the North and the South during the Civil War and restoration of the Union after the war. Dual listed with HIST 4450. *Prerequisite:* HIST 1210 and 1220/1221.

**5460. Post-Civil War America: The Gilded Age. 3.** An intensive study in the economic, cultural, and political developments which marked the U.S. in post-Civil War era, the rise of industry, the emergence of a distinctive national culture and the party struggles that shaped America's Gilded Age. Dual listed with HIST 4460. *Prerequisite:* HIST 1210 and 1220.

**5462. American Indian History to 1783. 3.** Surveys the history of American Indians from the period before contact to the end of the American Revolution. Examines the various contacts between American Indians and Europeans and considers what the American revolution meant to the continent's Native peoples. Dual listed with HIST 4462; cross listed with AIST 5462. *Prerequisites:* HIST/AIST 2290.

**5463. American Indian History to 1890. 3.** Surveys the history of American Indians during the era of westward expansion. Examines the impact of American westward movement and also the manifold changes that accompanied Indians moving west. Dual listed with HIST 4463; cross listed with AIST 5463. *Prerequisite:* HIST/AIST 2290.

**5464. American Indians in the 20th Century. 3.** Surveys the history of American Indians during the twentieth century. Examines the development of new cultural, social and political forms that help create an American Indian identity. Dual listed with HIST 4464; cross listed with AIST 5464. *Prerequisite:* HIST/AIST 2290.

**5465. Topics in American Indian History. 3.** Provides topical approach to American Indian history. Through extensive readings and thorough class discussion, students build upon previous course work in the field. The best recent studies on American Indians in the 19th and 20th centuries are featured. Limited enrollment. Dual listed with HIST 4465. *Prerequisite:* HIST 2290.

**5466. American Indian Ethnohistory. 3.** Surveys ethnohistorical methods and concepts and provides students concrete opportunities to use these methodologies in writing exercises. American Indian ethnohistory explores Native American experiences within their

own cultural contexts. Dual listed with HIST 4466; cross listed with AIST 5466. *Prerequisite:* ANTH/AIST 2210 or HIST/AIST 2210.

**5468. American Indians in the North American West. 3.** One of the defining features of the North American West is the presence of American Indians. Through the discussion of varied readings and primary document research, this course examines the history of American Indians in the West, with particular emphasis on the Great Plains and California. Dual listed with HIST 4468; cross listed with AIST 4468/5468. *Prerequisite:* HIST/AIST 2290.

**5470. The Birth of Modern America, 1890-1929. 3.** Studies political and diplomatic developments in the U.S. in the wake of industrialization and massive immigration. Some attention to cultural and social themes. Emphasizes shifting nature of reform between the depression of the 1890s and that of the 1930s. Dual listed with HIST 4470. *Prerequisites:* HIST 1210/1211 and 1220/1221.

**5475. American Environmental History. 3.** History of American attitudes and actions toward the land and natural resources. Dual listed with HIST 4475. *Prerequisite:* 6 hours of history.

**5480. Growth of Modern America, 1929-1960. 3.** A political and diplomatic overview of the United States in Depression, World War II and early Cold War periods. Some attention to cultural and social themes. Emphasis on economic crisis, growth of government, reform traditions, anti-communism, and civil rights. Dual listed with HIST 4480. *Prerequisites:* HIST 1210 and 1220.

**5490. Modern America, 1960 to Present. 3.** A political and diplomatic overview of the United States since 1960 with emphasis on impact of Cold War social and political tensions at home, civil rights, and government policies. Dual listed with HIST 4490. *Prerequisites:* HIST 1210 and 1220.

**5492. Revolutions in Latin America. 3.** Explores the meaning and impact of revolution in Latin America's modern history, focusing on political ideology, cultural expression, foreign relations, human rights, and globalization. Offers in-depth analysis of revolutions from the early nineteenth century to the present. Dual listed with HIST 4492. *Prerequisite:* 3 hours of relevant course work in HIST (e.g., 2290, 2380, 4495, 4496).

**5495. Borderlands in Latin America. 3.** Examines borderlands and frontiers in Latin American history, focusing on the U.S.-Mexico border region, the Southern Cone, and the Caribbean. Key issues include cultural contact

zones, colonialism, military expansion and conflict, and nation-building. Dual listed with HIST 4495.

**5496. History of Mexico. 3.** Intensive course in Mexican development. Emphasizes the 20th century especially the Mexican Revolution of 1910, showing how this nation transformed itself, into a modern nation state. Includes diplomatic relations with the U.S., incorporation of Indians, church-state relations, uses of land and other natural resources, role of the military and growth of Mexican nationalism. Dual listed with HIST 4496; cross listed with CHST 4496. *Prerequisite:* HIST 2380.

**5500. Readings in Women's Studies. 3.** An interdisciplinary course at the graduate level focusing on feminist criticism and theory, which draws on current debates in feminist analysis from the general areas of history, literature, and social science, to inform students of reformulations of research and unresolved issues. Dual listed with WMST 5500. *Prerequisites:* graduate status, 12 hours of 4000-level work.

**5505. The Old South, 1820-1861. 3.** The history of the South from the emergence of southern identity to the Civil War, with emphasis on southern society and culture. Dual listed with HIST 4505. *Prerequisite:* HIST 1210.

**5510. Modern East Asia. 3.** Focuses on the emergence of the modern East Asian states China, Japan, Korea and Vietnam as individual states and members of this important region historically and in contemporary era, understanding the emergence of those states as responses to internal forces and external pressures such as imperialism, nationalism, Communism and Capitalism. Dual listed with HIST 4510. *Prerequisite:* 6 hours of history.

**5515. American Legal History. 3.** An intensive study in the history of American law, the judicial system, the legal profession, and legal administration from colonial times to the present. Dual listed with HIST 4515. *Prerequisite:* HIST 1210, 1220 and/or consent of instructor.

**5525. American Southwest. 3.** Explores the Southwest as a location of cultural encounters and conflicts. Focuses on the cross-cultural interchange between American Indians, Mexican Indians and Anglo Americans from the fifteenth century to the present. Dual listed with HIST 4525. *Prerequisites:* HIST1210/1211, 1220/1221.

**5530. 19th Century American West. 3.** A study of the westward movement with emphasis on the trans-Mississippi West. Dual listed with HIST 4530. *Prerequisite:* HIST 1210 and 1220.

**5535. History of Oil. 3.** An intensive study in the history of oil development throughout the world. Emphasizes comparative studies of

the industry as it developed in various parts of the world and during various time periods, from pre-historic times to the present. The Wyoming oil/energy mineral history will be an important component of the course. Dual listed with HIST 4535. *Prerequisite:* 6 hours in history.

**5540. 20th Century American West. 3.** A study of the modern American West, with consideration of social, economic and political continuity and change. Dual listed with HIST 4540. *Prerequisites:* HIST 1210 and 1220.

**5545. The Multicultural West. 3.** Explores the American West as a meeting ground of diverse peoples and their diverse cultures. Focuses on the sustained cross-cultural interchange between Native Americans, Euro-Americans, African Americans, Latin Americans, and Asian Americans from trans-Appalachia to the Pacific Coast from the eighteenth century to the present. Dual listed with HIST 4545.

**5555. American Encounters. 3.** Examines the centrality of cross-cultural interchange in American history by focusing on a series of critical encounters between American, European, African, and Asian people from the 16th century to the present. *Prerequisite:* graduate standing.

**5560. American Social History in the 20th Century. 3.** History of social mobility and conflict in the 20th century. Special emphasis on impact of industrialization, rapid urbanization, massive immigration, ethnic minorities, race, religion, women and the family, painting, and architecture. Dual listed with HIST 4560. *Prerequisites:* HIST 1210 and 1220.

**5582. 20th Century U.S. Foreign Relations. 3.** Studies Twentieth Century United States foreign relations with a focus on the Cold War period. Examines economic sources of policy decisions, elites and mass public opinion, as well as cultural, religious, ethnic racial and gender issues. Dual listed with HIST 4582; cross listed with INST 5582. *Prerequisite:* HIST 1221.

**5585. Conference on U.S. History. 1-3 (Max. 6).** A reading and writing course designed to allow advanced students to investigate shifting ideas about important topics in 20th century American history. Primary focus varies from semester to semester, but will be designated in the class schedule. Dual listed with HIST 4585. *Prerequisite:* 6 hours of American history.

**5600. Graduate Readings. 1-6 (Max. 12).** Fulfills two purposes in our graduate program in history. It allows students to do independent directed reading in preparation for their graduate examination in history and provides students with a flexible alternative to their programs to meet and complete requirements. *Prerequisite:* 15 semester hours of history.

**5605. Conference on Wyoming and the West. 1-4 (Max. 9).** *Prerequisite:* consent of instructor.

**5612. Archives III. 3 (Max. 6).** Designed as an internship to provide students hands-on experience in an archival setting. With guidance provided by the instructors, students are expected to arrange and describe a collection, understand the basics of cataloging, and work with researchers in the reference area. Students are asked to complete projects in each area, and are required to turn in work logs or journals regarding the internship experience. *Prerequisite:* HIST 4040/5040, HIST 4042/5042 and 18 hours of history.

**5615. Conference on Early American History. 1-4 (Max. 9).** *Prerequisite:* consent of instructor.

**5620. Conference on Middle-Period and United States History. 1-4 (Max. 9).** *Prerequisite:* consent of instructor.

**5630. Seminar on Western American History. 3.** *Prerequisite:* consent of instructor.

**5640. Conference on American Indian History. 1-4 (Max. 9).** An intensive readings course using some of the best Indian history written in the last twenty years. *Prerequisite:* consent of instructor.

**5645. Seminar on American Indian History. 3.** Research seminar on American Indian history. The focus of the seminar may vary, but emphasis will usually be given to American Indians of the western United States in the nineteenth and twentieth centuries. *Prerequisite:* consent of instructor.

**5650. Conference on Medieval European History. 1-4 (Max. 9).** *Prerequisite:* consent of instructor.

**5655. Seminar on Medieval European History. 3 (Max. 9).** *Prerequisite:* consent of instructor.

**5660. Conference on Early Modern Europe. 1-4 (Max. 9).** The student, in consultation with the instructor, chooses a topic on which he/she reads extensively. The instructor provides bibliographical guidance. Normally the student discusses the reading at length with the instructor once a week. Written analysis of the reading may also be required. The course may be offered to a group of students who need extensive reading to go with the research experience they are receiving in seminars. *Prerequisite:* 14 semester hours in history and consent of instructor.

**5665. History and Philosophy of American Education. 3.** Provides cultural, philosophical, and historical perspectives drawn from the American experience and centered in the American ideology of equality of educational opportunity. Major trends and philosophies

that have developed, and are developing, in American education will be shared through discussion, presentations, and written projects. Dual Listed with HIST 4665. Cross listed with EDCI 5665. *Prerequisites:* Graduate student status; priority enrollment given to students registered in the C&I/Curriculum Studies area.

**5670. Seminar on Early American History. 3.** *Prerequisite:* consent of instructor.

**5675. Seminar on Middle-Period U.S. History. 3.** *Prerequisite:* consent of instructor.

**5680. Seminar on Recent U.S. History. 3.** *Prerequisite:* consent of instructor.

**5685. Conference on European 19th and 20th Century History. 1-4.** Available for a maximum of 9 hours. *Prerequisite:* consent of instructor.

**5690. Seminar on European History. 3.** Available for a maximum of 9 hours. *Prerequisite:* consent of instructor.

**5695. Conference on English History. 1-4 (Max. 9).** The student, in consultation with the instructor, chooses a topic on which he/she reads extensively. The instructor provides bibliographical guidance. Normally the student discusses the reading at length with the instructor once a week. Written analysis of the reading may also be required. May be offered to a group of students who need extensive reading to go with the research experience they are receiving in seminars. *Prerequisite:* 14 semester hours in history and consent of instructor.

**5700. Seminar on Cultural History. 3.** Examines the multiple ways in which historians and anthropologists have approached the concept of culture. Readings include both case studies and theoretical writings from different schools of cultural studies, ranging from the French Annales School to Postmodernism. Topics to be covered include popular culture, microhistory, gender and discourse theory. *Prerequisite:* graduate standing.

**5800. Conference on Latin American History. 1-4 (Max. 9).** *Prerequisite:* consent of instructor.

**5810. Seminar on Latin American History. 1-4 (Max. 12).** *Prerequisite:* consent of instructor.

**5880. History Theory. 3.** *Prerequisite:* consent of instructor.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Students are expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Designed for students involved in research for their dissertation. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Languages— Modern and Classical

231 Hoyt Hall, 766-4177

**FAX: (307) 766-2727**

**Web site:** [www.uwyo.edu/modlang](http://www.uwyo.edu/modlang)

**Department Chair:** Joy Landeira

### Professors:

**PHILIP HOLT**, B.A. St. John's College 1969; Ph.D. Stanford University 1976; Professor of Classics 2005, 1993, 1987.

**JOY LANDEIRA**, B.A. University of Wyoming 1973; M.A. 1975; Ph.D. University of Colorado, Boulder 1981. Professor of Spanish 2015. Department Chair.

**HANNELORE MUNDT**, Staatsexamen, Rheinisch-Westfälische Technische Hochschule Aachen 1977; Ph.D. University of California-Irvine 1984; Professor of German 2004, 1998, 1996.

### Associate Professor:

**KHAMA-BASSILI TOLO**, G3: Gradué en Pédagogie Appliquée, Option: Français-Linguistique Africaine, Université Nationale du Zaïre 1976; L2: Licencié en Pédagogie Appliquée, Option: Français, 1978; M.A. Vanderbilt University 1986; Ph.D. 1989; Associate Professor of French 1996, 1990.

### Assistant Professors:

**EKATERINA ALEXANDROVA**, B.A. Saint Josephs University 2003; M.A. Dartmouth College 2004; Ph.D. University of Pennsylvania 2012; Assistant Professor of French 2012.

**IRENE CHECA-GARCIA**, B.A. University of Granada 1997; M.A. Linguistics University of Granada 2000; Ph.D. Universidad de Almería 2004; Assistant Professor of Spanish 2012.

**CONXITA DOMÈNECH**, B.A. Universitat Autònoma de Barcelona 1990; M.A. 1992; M.A. University of Colorado Boulder 2006; Ph.D. 2010; Assistant Professor of Spanish 2011.

**REBECCA E. STEELE**, B.A. Leibnitz-Academie 2001; M.A. Rutgers, The State University of New Jersey 2008; Ph.D. 2009; Assistant Professor of German 2009, 2012.

### Senior Professional Lecturer:

**JOSEPH KRAFCEK**, B.A. University of Wyoming 1983; M.A. University of Michigan 1986; Senior Professional Lecturer in Russian 2005, 1988.

### Senior Academic Professional Lecturer:

**LAURA DE LOZIER**, B.A. Beloit College 1990; M.A. University of Wisconsin 1992; Ph.D. 2002; Senior Academic Professional Lecturer in Latin 2006; Assistant Department Chair.

### Academic Professional Lecturers:

**PETRA HEINZ**, M.A. Ludwig-Maximilians-Universität 1990; Assistant Academic Professional Lecturer in ESL 2013.

**JENNIFER LAVANCHY**, B.A. University of Wyoming 2004; M.A. 2006, 2008; Assistant Academic Professional Lecturer in Spanish 2011.

**MARK W. PERSON**, B.A. University of Wyoming 1983; M.A. 1986; Associate Academic Professional Lecturer in German 2008.

**BÉNÉDICTE SOHIER**, B.A. Stephen F. Austin State University 2006; M.A. Indiana University Bloomington 2008; Associate Academic Professional Lecturer in French 2015, 2009.

**YAN ZHANG**, B.A. Harbin Institute of Technology 2000; M.A. Heilongjiang Provincial Academy of Social Sciences 2002; Associate Academic Professional Lecturer in Chinese 2011, 2006.

### Temporary Lecturers:

Roland Akpovo, Christian Greaser, Sonia Rodriguez-Hicks, Xuan-Xabier Huynh, Comlan Igor, Noah Miles, Mary Katherine Scott

### Professors Emeriti:

M. Ian Adams, Lewis Bagby, Lowell A. Bangerter, Klaus D. Hanson, Francis S. Heck, Walter G. Langlois, Carlos Mellizo-Cuadrado, Jean-Louis G. Picherit, Pavel Sigalov, Duane Rhoades



The Modern and Classical Languages department offers work leading to the B.A. degree with majors and minors in French, German, Russian and Spanish, or concentrations for the B.A. in humanities/fine arts. A minor is offered in classical civilizations, Chinese, Latin and Japanese. The M.A. is available in French, German and Spanish. Courses are also offered in literature in translation.

### Foreign Language Requirements

All candidates for the B.A. and B.S. degree in the College of Arts and Sciences who matriculated before Fall 2015 are required to complete the equivalent of 8 semester hours of work in a single modern or classical language. Normally this requirement is satisfied by completing courses 1010 and 1020 with a letter grade of C or better in a single language, but completion of 1020 with a grade of C or better also satisfies the requirement. There are also other ways to satisfy the requirement: (1) a more advanced language course with a grade of C or better also constitutes the completion of the language requirement (for a list of applicable courses contact the department); (2) students with prior exposure to the language may be granted college credit after taking a written examination administered by the department; students must take this examination before completing registration for a language course (for regulations governing credit by examination, refer to Credit Available to Undergraduate Students in this *Catalog*); (3) an advanced placement, AP, examination in the language with a score of 4 or higher satisfies the language requirement, as do CLEP scores (see section on Credit by Examination on the department web site).

Students who do not wish college credit for previous high school language study should register in classes appropriate to their level of training. Those who have had two years of a foreign language in high school normally enter 1020 of that language, while those who have had three or more years of such study should take the placement examination to determine the course in which they should enroll and to avail themselves of the opportunity to receive credit by examination. Students in doubt about their ability are advised to take the placement examination. Students who have completed their language requirement can enroll for additional language courses of their choice, something strongly advised for those who wish to reach adequate levels of proficiency in the language or wish to study abroad. Check

the *Catalog* or web site for special sections targeted for students with varied experiences in the language.

### Undergraduate Major

A language major usually requires 30 semester hours of work in a single language beyond 2030. To include a language option in the humanities/fine arts interdisciplinary program, students must complete at least 12 hours above the 2030 level.

#### French

Required courses for the major in French are 2040, 2130 or 3110, 2140, 3005, 3050, 3060, 4100, 4110, plus 6 hours of electives at the 4000-level.

#### German

Required courses for the major in German are 2040, 2140, 3050, 4100 and 4110, plus 15 hours of electives in German at the upper-level.

German in-residency requirement: German majors need to take 3 of the following 6 courses to meet the in-residency requirement: GERM 4100, 4110, 4145, 4240, 4230, 4265.

#### Russian

Required courses for the major in Russian are RUSS 2040, 2140, 3050, 3060, 4070, 4080, 4200 and 9 hours of electives in Russian\* at the 3000-level or above. Coursework at the 3000-level or higher from study-abroad courses at Saratov University is also accepted ([www.uwo.edu/saratovstudy/](http://www.uwo.edu/saratovstudy/)).

\*Non-RUSS electives may include: HIST 2230, HIST 2240, HIST 4290.

#### Spanish

Spanish offers two major tracks:

- (1) The culture, literature, and cinema track requires 2040, 2140, 3050, 3100, 3120, plus 15 hours of electives above SPAN 2030.
- (2) The language-linguistics track requires 2040, 3050, 3060, 4090, 4310, plus 15 hours of electives above SPAN 2030.

Highly recommended electives for the language-linguistics track are SPAN 3080, SPAN 4080, and SPAN 4320. It is possible to take one class from the following: SPPA 4160; ENGL/LANG 4985; ANTH 4760; ANTH 4775; ANTH 4785; ANTH 4795.

### Humanities/Fine Art Majors

The humanities/fine art majors should have 2040, 2140 and 3050 as part of their language option. Prospective B.A. language majors should seek help from their advisers to work out a coordinated program of study. An additional area of concentration (e.g., a second foreign language, English, fine arts, philosophy, history, science or social science) is strongly recommended.

#### Minor

In general, students desiring to complete a minor in a foreign language will be required to complete a program of 18 semester hours above 2030. The requirements for individual languages are as follows:

<b>Chinese</b>	
CHIN 2040 .....	4
CHIN 2041 .....	3
CHIN 3050 .....	3
CHIN 3065 .....	3
CHIN 3055 .....	3
CHIN 4070 .....	3
<b>Total</b>	<b>18</b>

#### Classical Civilizations

CLAS 2020 or HIST 2120 .....	3
CLAS 2040 or HIST 2130 .....	3
Electives .....	12
12 hours chosen from Classics 3000-level or above. Up to 6 hours of Latin at the 3000-level or above may be counted as electives. Other courses about ancient Mediterranean cultures that are not taught under Classics may be submitted for approval as electives to the advisor for the minor.	
<b>Total</b>	<b>18</b>

<b>French</b>	
FREN 2140 .....	3
FREN 2040 .....	3
FREN 3050 .....	3
Electives .....	9
9 hours chosen from French at the 3000-level or above (at least 6 of these hours must be at the 4000-level).	
<b>Total</b>	<b>18</b>

<b>German</b>	
GERM 2140 .....	3
GERM 2040 .....	3
GERM 3050 .....	3
Electives .....	9
9 hours chosen from German at the 3000-level or above (at least 6 of these hours must be at the 4000-level).	
<b>Total</b>	<b>18</b>

<b>Japanese</b>	
JAPN 2040 .....	4
JAPN 3050 .....	3
Electives .....	12
Electives to be chosen from: LANG 2150; LANG 3105; LANG 3140; HP 2151/4151; JAPN 4990; HIST 2460; HIST 2461; JAPN 3060; JAPN 4070; JAPN 4080.	

**Total 19**

<b>Latin</b>	
LATN 3110 .....	3
LATN 3140 .....	2
LATN 4120 .....	3
LATN 4130 .....	3
Electives .....	7
Electives chosen from Latin at the 3000-level or above.	

**Total 18**

<b>Russian</b>	
RUSS 2040 .....	3
RUSS 2140 .....	3
RUSS 3050 .....	3
Electives .....	9
9 hours from Russian at the 3000-level or above (coursework at the 3000-level or higher from study-abroad courses at Saratov University is also accepted [www.uwo.edu/saratovstudy/]).	

**Total 18**

<b>Spanish</b>	
Electives .....	18
18 hours of electives in Spanish at the 2000-level or above (excluding SPAN 2030).	

**Total 18**

### Teaching Certification

For those wishing to pursue teaching certification, a concurrent major in Modern Language Education is also available. For details, contact the Department of Secondary Education.

### Native Language Credit

Students are not allowed university credit for language courses in their native language below the 4000 level, but may receive credit for literature courses below that level.

### Study Abroad

There are many opportunities for students to study abroad and students are encouraged to do so.

### Suggested Curriculum for B.A. in a Foreign Language

(for students with no prior background in the language)

<b>FRESHMAN YEAR: Fall</b>	<b>Hrs.</b>
Language 1010 .....	4
<b>FRESHMAN YEAR: Spring</b>	<b>Hrs.</b>
Language 1020 .....	4
<b>SOPHOMORE YEAR: Fall</b>	<b>Hrs.</b>
Language 2030 .....	4
<b>SOPHOMORE YEAR: Spring</b>	<b>Hrs.</b>
Language 2040 .....	3
Language 2140 .....	3
<b>JUNIOR YEAR: Fall</b>	<b>Hrs.</b>
Language 3050 .....	3
Language 3000-4000-level .....	3
<b>JUNIOR YEAR: Spring</b>	<b>Hrs.</b>
Language 3060 .....	3
Language 3000-4000-level .....	6
<b>SENIOR YEAR: Fall</b>	<b>Hrs.</b>
Language 4200 .....	3
<b>SENIOR YEAR: Spring</b>	<b>Hrs.</b>
Language 4000-5000-level .....	6

### Graduate Study

The Department of Modern and Classical Languages offers programs leading to the master of arts degree with majors in French, German, and Spanish. Contact the department for further details or check the department website.

### Program Specific Admission Requirements

Admission to the graduate program in a specific language is open to students who have completed an undergraduate major, or the equivalent, in the same subject and who meet the minimum requirements set forth in this *Catalog*.

Students entering the graduate program from other institutions may be required to make up visible deficiencies in areas covered by required courses in this department's undergraduate programs.

### Program Specific Degree Requirements

Degree requirements are based on the university minimum requirements.

### Classics (CLAS)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

**2020. Classical Greek Civilization. 3. [WB,C◀▶H]** Examines some of the most important developments of ancient Greek culture. Includes development of government in the city-states, with particular attention to Athenian democracy; tragedies of Aeschylus, Sophocles and Euripides; comedies of Aristophanes; crisis of values of the Peloponnesian War; and philosophy of Plato. *Prerequisite:* WA. **2040. Classical Roman Civilization. 3. [WB,CH◀▶(none)]** Examines some of the most interesting political, legal, artistic, literary, and engineering developments of the Republic and Principate (510 BC-AD 212). These include representational government, citizens' rights, sanctioned violence, Rome's infrastructure, and major literary works of oratory, comedy, history, epic, and philosophy. *Prerequisite:* WA or equivalent (as specified in USP requirements).

**3050. Athenian Democracy. 3.** Examines democratic government in ancient Athens: its origins and development, its practical workings, how politics were conducted and power was gained and exercised, citizen participation, law courts, and evaluations of democracy in the ancient world and since. Cross listed with HIST/POLS 3050. *Prerequisite:* WB.

**4230. Greek Tragedy. 3.** Reading and discussion of major plays by Aeschylus, Sophocles, and Euripides, together with examination of the performance and social context of Greek drama, its use of traditional myths, and selected issues in contemporary scholarship on the tragedies. Cross listed with ENGL/THEA 4230. *Prerequisite:* 3 hours of classics courses.

**4270. Classical Epic Poetry. 3.** Reading and discussion of major works of Greek and Latin epic poetry, centered on Homer and Vergil. Also includes consideration of the background of these works (both mythological and historical) and the development of the epic tradition in the ancient world. Cross listed with ENGL 4270. *Prerequisite:* completion of a USP WB course.

**4975. Independent Study. 1-4 (max. 12)** Specialized study in aspects of Greek or Roman civilization of interest to the student, with topic and plan of work to be worked out by the student and the instructor together. *Prerequisite:* 6 hours of Classics courses or consent of instructor. (Offered based on sufficient demand and resources)

**4990. Topics in Classical Civilization. 1-4 (max. 12)** Study in depth of special areas in ancient civilization that are not covered in regularly offered courses. *Prerequisite:* 6 hours of Classics courses or consent of the instructor. (Offered based on sufficient demand and resources)

## Chinese (CHIN)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**1010. First Year Chinese I. 4. [(none)♦H]** Fundamentals of grammar, conversation, and reading. Introduction to Chinese culture through the language.

**1020. First Year Chinese II. 4. [(none)♦H]** Fundamentals of grammar, conversation, and reading. Introduction to Chinese culture through the language. *Prerequisite:* CHIN 1010 or equivalent.

**2030. Second Year Chinese I. 4.** Grammar, composition, conversation and more vocabulary in Chinese. *Prerequisite:* CHIN 1020 or equivalent.

**2040. Second Year Chinese II. 3.** Further studies in grammar composition, conversation and more vocabulary in Chinese. *Prerequisite:* CHIN 2030 or equivalent.

**2041. Contemporary and Traditional Chinese Culture. 3.** Designed to provide those with a serious interest in China and Chinese language with a cultural context for learning Chinese language. Incorporates economic and social material to give students a clear view of Chinese culture with an emphasis on Chinese language instruction. *Prerequisite:* CHIN 2030.

**3050. Intermediate Composition and Conversation. 3.** Develop abilities to read and write complex Chinese texts with an intermediate level of understanding, including texts in both conversational and narrative styles. Reading and writing skills will build considerably on the skills learned in two years of university study in Chinese language. *Prerequisite:* CHIN 2040 or equivalent.

**3055. Business Chinese. 3. [G♦COM2]** Comprehensive course on business language skills. For students with proficiency in Mandarin at the Intermediate Mid level or higher. Focus is on language functions for the workplace. Productive skills, both spoken and written, will include the composition of extended frequently-used business documents. *Prerequisite:* CHIN 3050 or equivalent.

**3065. Intermediate Composition and Conversation II. 3.** Students will not only understand and construct complex speech and writing but will gain the ability to do so

effectively to persuade, discuss and communicate accurately with native Chinese speakers. Students will be able to relate topics such as personal experience, daily routine, reports, opinions and judgment in well-written Chinese paragraphs. *Prerequisite:* CHIN 3050 or equivalent.

**3160. See Movies, Touch China. 3. [(none)♦H]** This course combines exploration of classical and contemporary Chinese cultures through prominent Chinese films. The audio-video materials selected will be discussed in their historical context. Students will explore the transformations China has undergone, and will seek to understand the Chinese mindset. *Prerequisite:* COM1.

**4070. Business Chinese II. 3.** Apply previously acquired skills in complex Chinese language and business topics to the thorough analysis of case studies in Chinese business scenarios. Students will be able to read, discuss, and reach conclusions based on case studies of international companies in China and Chinese companies in international markets.

*Prerequisite:* CHIN 3055.

**3055. Business Chinese. 3. [G♦COM2]** Comprehensive course on business language skills. For students with proficiency in Mandarin at the Intermediate Mid level or higher. Focus is on language functions for the workplace. Productive skills, both spoken and written, will include the composition of extended frequently-used business documents. *Prerequisite:* CHIN 3050 or equivalent.

## English as a Second Language (ESL)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**1110 [AS 1110]. Introduction to Academic Writing Skills. 3.** Designed to introduce non-native speakers of English, who do not demonstrate the required competency in writing to enter AS 1210, to academic writing skills. Includes instruction in grammar and sentence structure, paragraph and essay writing. *Prerequisites:* TOEFL of 18 or lower; IELTS of 5 or lower.

**1210 [AS 1210; ENGL 1210]. English Composition for International Students. 3. [WA♦COM1].** Accommodates students of different cultures and different levels of English proficiency. The objective is to equip students with procedural knowledge - a set of routines that can be applied in various academic writing patterns, such as description, process analysis, argumentation and the research essay. *Prerequisite:* AS 1000.

**2110 [AS 2110; ENGL 2110]. English Oral Skills. 3.** Instruction for Novice to advanced Low speakers in refining English pronunciation, stress and intonation, listening comprehension, oral grammar practice and building vocabulary. Satisfactory/Unsatisfactory only.

*Prerequisite:* consent of instructor.

**3050. Advanced Academic Writing for International Students. 3. [WB♦COM2].** Through ESL learner targeted instruction, practices, and feedback, the course will emphasize and progressively develop transferrable skills for students' academic work and future professions. It will continue to build on writing skills and emphasize foundational oral and digital communication skills. *Prerequisite:* WA/COM1.

**4010. Technical Writing for International Students. 3. [WC♦COM3].** Prepares students from a culturally diverse background for the communication demands of the 21st century. Students conduct rhetorical analysis of various audiences and purposes in order to design, develop, revise and edit disciplinary and interdisciplinary technical communications, such as reports, proposals, job applications, research related documents and oral presentations. *Prerequisites:* WA/COM1, WA/COM2, and junior standing.

## French (FREN)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**1010. First Year French I. 4. [(none)♦H]** Fundamentals of grammar, composition, conversation and reading.

**1020. First Year French II. 4. [(none)♦H]** Fundamentals of grammar, composition, conversation and reading. *Prerequisite:* FREN 1010 or two years of high school French.

**2030. Second Year French I. 4. [(none)♦H]** Emphasizes the development of communication skills (listening, speaking, reading and writing) so as to help students function effectively in real-life contexts. Provides a systematic review of grammatical structures necessary for successfully communicating in French. *Prerequisite:* FREN 1020 or three years of high school French.

**2040. Second Year French II. 3. [(none)♦H]** A course stressing the usage of the language through composition, conversation, oral presentations and grammar review. *Prerequisite:* FREN 2030, three years of high school French or FREN 1010, 1020 with grade of B or better.

- 2130. Contemporary French Culture. 3. [(none)♦H]** Designed as an introduction to contemporary French culture. It gives students an in-depth insight into contemporary French life. It also deals with issues affecting the French-speaking world in general: Quebec, Africa, New Caledonia, Switzerland, Monaco, etc. *Prerequisite:* FREN 1020 or equivalent.
- 2140. Introduction to Reading. 3. [CH,G♦(none)]** Introduction to the literature of France; analysis of major literary types and elements of criticism. *Prerequisite:* FREN 2030.
- 3005. French Phonetics and Pronunciation. 3.** Focus on the phonetic structures of French through systematic pronunciation drills and phonetic transcriptions. Varied oral activities and exercises will help develop an awareness of spoken French and improve students' pronunciation. *Prerequisite:* FREN 2040 or equivalent.
- 3050. Third Year French I. 3. [WB♦COM2]** A course stressing the usage of the language through composition, conversation, oral presentations and grammar review. *Prerequisite:* FREN 2040.
- 3060. Third Year French II. 3.** A course stressing the usage of the language through composition, conversation, oral presentations and grammar review. *Prerequisite:* FREN 3050.
- 3070. Cinema for French Conversation. 3.** Emphasizes speaking and listening comprehension through contemporary films, while providing socio-cultural competence, vocabulary acquisition and grammar review. *Prerequisite:* FREN 3050.
- 3105. Masterpieces of French Literature in Translations. 3.** A study in English of representative works of French literature from the Middle Ages to the present. No credit for French majors. *Prerequisite:* ENGL 1020. (Offered based on sufficient demand and resources)
- 3110. Contemporary French Civilization. 3.** Emphasizes the institution and values of contemporary France. Deals with the major political, social, cultural and economic aspects of today's France. Will be taught in French. *Prerequisite:* FREN 3050.
- 3990. Independent Study. 1-4 (Max. 4).** Books or periodicals of special interest to the student, selected in consultation with a member of the staff; independent reading and reports. *Prerequisite:* FREN 2030.
- 4080. Studies in the French Language. 3 (Max. 9).** The topics explored under this general heading include: translation, history of the French language, French of the media and conversation. Dual listed with FREN 5080. *Prerequisite:* FREN 3060.
- 4085. Studies in French Culture. 3.** Multiple topic course: (a) Business French focusing on the socio-economic, linguistic and administrative aspects of doing business in French; (b) Explication de textes, providing a systematic introduction to textual analysis; taught alternately. Dual listed with FREN 5085. *Prerequisite:* FREN 3060.
- 4100. A Survey of French Literature I. 3.** A study of French Literature and civilization from the Middle Ages through the 18th century. *Prerequisite:* FREN 2140 or equivalent.
- 4110. A Survey of French Literature II. 3.** A study of French Literature and civilization from the 19th century to the present. *Prerequisite:* FREN 2140 or equivalent.
- 4120. Medieval French Literature. 3.** A survey of medieval French literature: epic, courtly poetry, Arthurian romance, theatre and the poetry of Villon. Dual listed with FREN 5120. *Prerequisites:* FREN 3050; FREN 4100 and 4110 strongly recommended.
- 4130. Renaissance French Literature. 3.** A study of the new spirit after the Middle Ages. Authors studied: Rabelais, the poets of the Pleiade, Montaigne and others. Dual listed with FREN 5130. *Prerequisite:* FREN 3050; FREN 4100 and 4110 strongly recommended.
- 4140. 17th Century French Literature. 3. [WC♦(none)]** A survey of representative works from the major literary genres from the formative period to classicism and its aftermath. Dual listed with FREN 5140. *Prerequisites:* FREN 3050; FREN 4100 and 4110 strongly recommended.
- 4250 [4150]. 19th Century French Literature. 3.** Development of romanticism from Rousseau on with excerpts from Chateaubriand and romantic poets like Hugo and Vigny. The period of realism-naturalism focuses on novels of Flaubert and Zola, while the symbolist school of poetry is represented by Baudelaire, Verlaine and Rimbaud. Dual listed with FREN 5250. *Prerequisites:* FREN 3050; FREN 4100 and 4110 strongly recommended.
- 4260 [4160]. 20th Century French Literature. 3.** The era since 1900 is divided into four parts: pre-World War I, between the wars, post-World War II and the New Wave. These periods are represented by authors including Valery, Proust, Malraux, Saint-Exupery, Camus, Sartre and others. Dual listed with FREN 5260. *Prerequisite:* FREN 3050; FREN 4100 and 4110 strongly recommended.
- 4350. Studies in French and Francophone Literatures. 3.** An intensive study of a topic, period or author (pertaining to French or Francophone literature), to be selected according to interest and currency). Dual listed with FREN 5350. *Prerequisites:* FREN 3060; FREN 4100 and 4110 strongly recommended.
- 4990. Advanced Independent Study. 1-3 (Max. 6).** Special projects designed to meet the needs of individual students, designed in consultation with instructor. *Prerequisites:* FREN 3050 and consent of instructor.
- 5080. Studies in French Language. 3. (Max 9).** Topics explored include: French translation, history of the French language, French of the media, and conversation. *Prerequisite:* FREN 3060.
- 5085. Studies in French Culture. 3.** Multiple topic course: (a) Business French focusing on the socio-economic, linguistic and administrative aspects of doing business in French; (b) Explication de textes, providing a systematic introduction to textual analysis; taught alternately. Dual listed with FREN 4085. *Prerequisite:* FREN 3060.
- 5120. Medieval French Literature. 3.** A survey of medieval French literature: Epic, courtly poetry, Arthurian romance, theatre, and the poetry of Villon. Dual listed with FREN 4120. *Prerequisites:* FREN 3050; FREN 4100 and 4110 strongly recommended.
- 5130. Renaissance French Literature. 3.** A study of the new spirit after the Middle Ages. Authors studied: Rabelais, the poets of the Pleiade, Montaigne, and others. Dual listed with FREN 4130. *Prerequisites:* FREN 3050; FREN 4100 and 4110 strongly recommended.
- 5140. 17th Century French Literature. 3.** A survey of representative works from the major literary genres from the formative period to classicism and its aftermath. Dual listed with FREN 4140. *Prerequisites:* FREN 3050; FREN 4100 and 4110 strongly recommended.
- 5160. Graduate Readings. 1-5 (Max. 6).** *Prerequisite:* undergraduate major or minor in the subject.
- 5170. Special Problems. 1-2 (Max. 6).** *Prerequisite:* undergraduate major or minor in the subject.
- 5250. 19th Century French Literature. 3.** Development of romanticism from Rousseau on with excerpts from Chateaubriand and romantic poets like Hugo and Vigny. The period of realism-naturalism will focus on novels each of Flaubert and Zola while the Symbolist School of poetry will be represented by Baudelaire, Verlaine and Rimbaud. Dual listed with FREN 4250. *Prerequisites:* FREN 2050; FREN 4100 and 4110 strongly recommended.
- 5260. 20th Century French Literature. 3.** The era since 1900 is divided into 4 parts: Pre-World War I, between the wars, post-World War II and the New Wave. These periods are represented by such authors as Valery, Proust,

Malraux, Saint-Exupery, Camus, Sartre and others. Dual listed with FREN 4260. *Prerequisites:* FREN 3050; FREN 4100 and 4110 strongly recommended.

**5350. Studies in French and Francophone Literatures. 3.** An intensive study of a topic, period or author (pertaining to French or Francophone literature, to be selected according to interest and currency). Dual listed with FREN 4350. *Prerequisites:* FREN 3060; FREN 4100 and 4110 strongly recommended.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1 - 3 (Max 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## German (GERM)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

**1010. First Year German I. 4. [(none)◀▶H]** Explores fundamentals of grammar, composition, conversation and reading.

**1020. First Year German II. 4. [(none)◀▶H]** Examines fundamentals of grammar, composition, conversation and reading. *Prerequisite:* GERM 1010 or two years of high school German.

**2030. Second Year German I. 4. [(none)◀▶H]** Includes reading simple novels, short stories, and dramas; grammar review; and conversation. Eight required laboratory exercises. *Prerequisite:* GERM 1020 or three years of high school German.

**2040. Second Year German II. 3. [(none)◀▶H]** Encompasses formal grammar review; weekly composition; as well as drill of

oral skill including pronunciation, oral reports and free conversation. *Prerequisite:* GERM 2030 or three years of high school German.

**2140. Introduction to Literature. 3. [CH,G◀▶(none)]** Introduces literature of Germany. Analyzes major literary types and elements of criticism. *Prerequisite:* GERM 2030 or three years of high school German.

**3006. 20th Century German Culture and Civilization. 3. [WC,CH◀▶(none)]** Major political, ideological and cultural developments in Germany between 1871 and the present. An interdisciplinary approach (history, art history, film and literature) allows students to explore and assess a nation's culture and civilization as well as far-reaching events (WWI, WWII and the Holocaust) from various perspectives. *Prerequisite:* junior standing.

**3050. Third Year German I. 3. [WB◀▶COM2]** Encompasses formal grammar review; weekly composition; as well as drill of oral skill including pronunciation, oral reports and free conversation. *Prerequisite:* GERM 2040.

**3060. Third Year German II. 3.** Emphasizes weekly compositions and corrective practice, stylistic analysis of representative texts and group discussion on prepared topics. *Prerequisite:* GERM 3050.

**3150. German History and Culture. 3. [CH,G◀▶(none)]** Taught in English, this class engages students both theoretically and practically with German history and culture throughout the ages from the Middle Ages to today. Reading content is complemented with outings to culturally and historically significant sites in Germany as part of a summer study abroad program. *Prerequisite:* WA or equivalent.

**3990. Independent Study. 1-4 (Max. 4).** Focuses on books or periodicals of special interest to the student selected in consultation with a staff member; independent reading and reports. *Prerequisite:* GERM 2030.

**4070. Fourth Year German. 3.** Emphasizes weekly compositions and corrective practice, stylistic analysis of representative texts and group discussion on prepared topics. Dual listed with GERM 5070. *Prerequisite:* GERM 3060. (Offered every other year)

**4080. German-English and English-German Translation. 3. [WB◀▶(none)]** Encompasses written translation exercises based on contemporary and relevant texts in both English and German. Addresses specific translation problems arising in both English and German, when translating into the other language. *Prerequisites:* GERM 3050 and/or 3060. (Offered fall semester)

**4095. Masterpieces of German Literature in English. 3.** Introduces students to masterpieces of German literature in English translation from the Age of Enlightenment to the present. Discussions of literary movements and periods, authors and the cultural, social and historical background in which these masterpieces were written are included in the interpretations of the texts. Dual listed with GERM 5095. *Prerequisite:* WB.

**4100. A Survey of German Literature I. 3.** Studies German literature and civilization from the Middle Ages to the 17th century. Dual listed with GERM 5100. *Prerequisite:* GERM 2140 or equivalent.

**4110. A Survey of German Literature II. 3.** Studies German literature and civilization from the 18th century to the end of the 20th century. Dual listed with GERM 5110. *Prerequisite:* GERM 2140 or equivalent.

**4145. Weimar Classicism. 3.** Introduces student to Weimar Classicism, one of the crucial periods in German literature and culture. Explores the foundation of the movement, its cultural and historical contexts, aesthetic and philosophical principles, and significant works during this period. Primary language for instruction for this course is German. Dual listed with GERM 5145. *Prerequisite:* GERM 2140 or equivalent.

**4180. German Poetry. 3.** Surveys poetry from the Middle Ages to the present. Emphasizes poetry after 1600. Treats formal elements and genre categories. Dual listed with GERM 5180. *Prerequisite:* GERM 2140.

**4190. Contemporary German Drama. 3.** Surveys the most important dramas and trends since 1945. Includes readings in modern drama theory. Dual listed with GERM 5190. *Prerequisite:* GERM 2140 or equivalent.

**4200. Introduction to Research. 1-3 (Max. 9).** Senior seminar on a topic varying from year to year. Includes study of standard bibliographical guides. Minimum of 3 hours recommended for majors. *Prerequisite:* 12 hours of 4000-5000-level courses.

**4230. 19th Century German Drama. 3.** Studies popular tastes and intellectual endeavors in 19th century drama after the age of Goethe. Surveys the literature during Romanticism, Young Germany, Realism, Naturalism and Expressionism. Dual listed with GERM 5230. *Prerequisite:* GERM 2140 or equivalent.

**4240. German Literature of the Romantic Period. 3.** Introduces the philosophical bases of German Romanticism and analyzes representative works of prose and poetry. Dual listed with GERM 5240. *Prerequisite:* GERM 2140 or equivalent.

**4255. 19th Century German Novellas. 3.** Studies a wide selection of significant German novellas from the period when this genre flourished in the German-speaking world, with a popularity unparalleled in the rest of Europe. Examines the form's origins, evolution, reception, and theory. Dual listed with GERM 5255. *Prerequisite:* GERM 2140 or equivalent.

**4265. A Divided Nation: Politics and Culture in Germany 1945 to 1990. 3.** Introduces students to major political, ideological and cultural developments in East and West Germany between 1949 and 1990. Investigates the construction of national identities based on major writings by East and West German philosophers, intellectuals and creative writers. Course is taught in German. Dual listed with GERM 5265. *Prerequisite:* GERM 2140 or equivalent.

**4275. Contemporary Migration Literature. 3.** Introduces students to a range of recent cultural production by artists identified with immigrant communities or communities of color. Topics examined include intersections of gender, race, nation, culture, and class; experiences of different minorities; question of national and transnational identity, self-representation, immigration, multiculturalism and integration debates. Course is taught in German. Dual listed with GERM 5275. *Prerequisite:* GERM 2140 or equivalent.

**4285. 20th/21st Century German Film. 3.** Introduces students to classical German films, and thereby enhances their skills to conduct research in the Humanities. Themes to be discussed: representation of authority, issues of race and gender, German culture and history, the Americanization of German culture, minorities in contemporary Germany. Dual listed with GERM 5285. *Prerequisite:* WB.

**4990. Advanced Independent Study. 1-3 (Max. 6).** Encompasses special projects designed to meet needs of individual students, designed in consultation with instructor. *Prerequisites:* GERM 2140 and consent of instructor.

**5070. 4th Year German. 3.** Emphasizes weekly compositions and corrective practice, stylistic analysis of representative texts, and group discussions on prepared topics. Dual listed with GERM 4070. *Prerequisite:* GERM 3060.

**5095. Masterpieces of German Literature in English. 3.** Introduces students to masterpieces of German literature in English translation from the Age of Enlightenment to the present. Discussions of the literary movements and periods, authors and the cultural, social and historical background in which these

masterpieces were written are included in the interpretations of the texts. Dual listed with GERM 4095. *Prerequisite:* graduate standing.

**5100. A Survey of German Literature I. 3.** A study of German literature and civilization from the Middle Ages to the seventeenth century. Dual listed with GERM 4100. *Prerequisite:* GERM 2140 or equivalent.

**5110. A Survey of German Literature II. 3.** A study of German literature and civilization from the eighteenth century to the end of the twentieth century. Dual listed with GERM 4110. *Prerequisite:* GERM 2140 or equivalent.

**5145. Weimar Classicism. 3.** Introduces students to Weimar Classicism, one of the crucial period in German literature and culture. Explores the foundation of the movement, its cultural and historical contexts, aesthetic and philosophical principles, and significant works written by Goethe and Schiller during this period. Taught in German. Students are expected to read, write and discuss in German. Dual listed with GERM 4145. *Prerequisite:* graduate standing.

**5150. Studies in German Literature. 2-3 (Max. 6).** An intensive study of a topic or an author. Designed primarily for graduate students, the course is open to seniors with permission of the instructor. *Prerequisite:* 12 semester hours of German literature at 4000-level.

**5160. Graduate Readings. 1-5 (Max. 6).** *Prerequisite:* undergraduate major or minor in the subject.

**5170. Special Problems. 1-2 (Max. 6).** *Prerequisite:* undergraduate major or minor in the subject.

**5180. German Poetry. 3.** A survey of poetry from the Middle Ages to the present. Emphasis on poetry after 1600. Treatment of formal elements and genre categories. Dual listed with GERM 4180. *Prerequisite:* GERM 2140.

**5190. Contemporary German Drama. 3.** A survey of the most important dramas and trends since 1945. Readings in the theory of modern drama. Dual listed with GERM 4190. *Prerequisite:* GERM 2140 or equivalent.

**5230. 19th Century German Drama. 3.** Popular tastes and phonetic intellectual endeavors in nineteenth century drama after the age of Goethe. Survey of the literature during Romanticism, Young Germany, Realism, Naturalism, and Expressionism. Dual listed with GERM 4230. *Prerequisite:* GERM 2140 or equivalent.

**5240. German Literature of the Romantic Period. 3.** An introduction to the philosophical bases of German Romanticism and analysis

of representative works of prose and poetry. Dual listed with GERM 4240. *Prerequisite:* GERM 2140 or equivalent.

**5255. 19th Century German Novellas. 3.** Studies a wide selection of German novellas from the period when this genre flourished in the German-speaking world, with a popularity unparalleled in the rest of Europe. Examines the form's origins, evolution, reception, and theory. Dual listed with GERM 4255. *Prerequisite:* GERM 2140 or equivalent.

**5265. A Divided Nation: Politics and Culture in Germany 1945-1990. 3.** Introduces students to major political, ideological and cultural developments in East and West Germany between 1949 and 1990. Investigates the construction of national identities based on major writings by East and West German philosophers, intellectuals and creative writers. Taught in German. Dual listed with GERM 4265. *Prerequisites:* GERM 2140 or equivalent, graduate standing.

**5275. Contemporary Migration Literature. 3.** Introduces students to a range of recent cultural productions by artists identified with immigrant communities or communities of color. Topics examined include: the intersections of gender, race, culture, and class; experiences of different minorities in unified Germany; question of national and transnational identity, self-representation, immigration, multiculturalism and integration debates. Taught in German. Students are expected to read, write and discuss in German. Dual listed with GERM 4275. *Prerequisite:* GERM 2140 or equivalent.

**5285. 20th/21st Century German Film. 3.** Introduces students to classical German films, and thereby enhances their skills to conduct research in the Humanities. Themes to be discussed: representation of authority, issues of race and gender, German culture and history, the Americanization of German culture, minorities in contemporary German. Taught in English. Dual listed with GERM 4285. *Prerequisites:* graduate standing.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Greek (GRK)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

**1010. First Year Greek I. 4.** Studies fundamentals of grammar, composition and reading in Classical Greek. (Offered based on sufficient demand and resources)

**1020. First Year Greek II. 4.** Studies grammar, composition and reading in Classical Greek. *Prerequisite:* GRK 1010. (Offered based on sufficient demand and resources)

**2030. Second Year Greek. 4.** Explores reading simple texts, stories and dramas, as well as grammar review. *Prerequisite:* GRK 1020 or equivalent. (Offered based on sufficient demand and resources)

**2040. Second Year Greek II. 4.** Further studies in grammar and reading simple texts, stories, and dramas. (Offered based on sufficient demand and resources.) *Prerequisites:* GRK 2030 or the equivalent.

**3990. Independent Study. 1-4 (Max. 12).** Encompasses independent reading, selected in consultation with instructor. *Prerequisite:* GRK 1020 or equivalent. (Offered based on sufficient demand and resources)

## Japanese (JAPN)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

**1010. First Year Japanese I. 4. [(none)◀▶H]** Studies fundamentals of grammar, composition, conversation and reading. Introduces Japanese culture through the language. (Offered fall semester)

**1020. First Year Japanese II. 4. [(none)◀▶H]** Studies fundamentals of grammar, composition, conversation and reading. Introduces Japanese culture through the language. *Prerequisite:* JAPN 1010 or equivalent. (Offered spring semester)

**2030. Second Year Japanese I. 4.** Encompasses reading, speaking and writing in original Japanese syllabaries, including elementary kanji characters for daily practical application. *Prerequisite:* JAPN 1020 or equivalent. (Offered fall semester)

**2040. Second Year Japanese II. 4.** Encompasses reading, speaking and writing in original Japanese syllabaries, including elementary kanji characters for daily practical application. *Prerequisites:* JAPN 1020 and 2030 or equivalent. (Offered based on sufficient demand and resources)

**3050. Third Year Japanese I. 3.** Stresses usage of the language through composition, conversation, oral presentation and grammar review. *Prerequisite:* JAPN 2040 or equivalent. (Offered based on sufficient demand and resources)

**3060. Third Year Japanese II. 3.** Stresses usage of the language through composition, conversation, oral presentation and grammar review. *Prerequisites:* JAPN 2040 and 3050 or equivalent. (Offered based on sufficient demand and resources)

**3990. Independent Study. 1-4.** Projects in language or literature designed to meet specific student needs or interests, selected in consultation with faculty; independent reading and reports. *Prerequisite:* JAPN 2030.

**4070. Fourth Year Japanese I. 3.** Incorporates intensive grammar review and combination skill development. Also emphasizes specialized lexicons, written and oral translations, conversational fluency and additional kanji characters. *Prerequisite:* JAPN 3060. (Offered based on sufficient demand and resources)

**4990. Advanced Independent Study. 1-3 (Max. 6).** Encompasses special projects pertaining to Japanese language or literature to meet needs of individual students designed in consultation with instructor. *Prerequisites:* JAPN 3050 and consent of instructor. (Offered based on sufficient demand and resources)

## Language (LANG)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

**1030. Intellectual Community in Cinema Etc. 3. [I◀▶(none)]** Introduces students to a range of issues within the humanities through the analysis of film, television, and theater. Taught alternately by Modern and Classical Languages and English. Cross listed with ENGL 1030.

**2150. Manga: History and Culture. 3. [(none)◀▶COM2]** Manga is one of the most important art forms to emerge from Japan. Its importance as a medium of visual culture and storytelling cannot be denied. Through reading and examination of texts, students will understand the relevance of comics in Japanese society. *Prerequisite:* COM1.

**3105. Major Themes in Chinese and Japanese Literature. 3-4 (Max. 4).** Explores mindsets of two rich and ancient civilizations, China and Japan. Considers distinctive characters of each civilization, while illuminating basic elements that we share with these peoples. *Prerequisite:* ENGL 1010.

**3140. Anime: History and Culture. 3. [G,WB◀▶(none)]** An introduction to the history, development, and cultural significance of Japanese animation. Through the examination of a variety of anime genres, students will gain insight into contemporary Japan as well as important historical periods. We will read analyses of particular anime, emphasizing the unique characteristics of the art and the mystery of its popularity in the US. *Prerequisite:* completion of WA.

**4485. Latin Diaspora: Comparative History of U.S. 3.** History of U.S. Latino peoples including Mexican Americans, Puerto Ricans, Cubans, Dominicans, Central Americans, South Americans and Spaniards. Historical context, origins, development of Latin American national, cultural identities, regional characteristics, immigration; nativist responses; assimilation, cultural continuity and change. Similarities, general patterns and differences, Hispanic and Pan Latino identities and probable future trends. *Prerequisite:* HIST 2370 or 2380 or CHST 1100.

**4750 [3750]. Fundamentals of Linguistics. 3.** An introduction to fundamentals of linguistic study, including phonology, morphology, semantics, pragmatics, and syntax, with a focus on the application of linguistic theory. Cross listed with ANTH/ENGL 4750. *Prerequisite:* 8 hours of foreign language.

**4770 [3770]. Sociolinguistics. 3.** Following an introduction to the fundamentals of linguistic study, an examination of the relationship and interactions among language, society, and culture, including linguistic and social behaviors with regard to the creation and modification of cultural identity. Cross listed with ANTH/ENGL 3770. *Prerequisite:* 8 hours of foreign language.

**4785. Linguistics, Language Teaching and Social Context. 3.** Introduces prospective teachers of English as second language to the basic components of language and to the social aspects of human language use. Explores

a variety of concepts about language: how it is used and perceived, how languages change, how diverse cultures respond to such changes. Cross listed with ENGL 4785. *Prerequisite:* WB. **4800. Advanced Instruction In: \_\_\_\_ 1-3 (Max. 12).** Advanced study and projects designed to meet special needs and interests of students, to be selected in consultation with a suitable member of the faculty. *Prerequisite:* consent of instructor.

**4975. Independent Study In: \_\_ 1-3 (Max. 12).** Further work in a less commonly taught language, for students who have at least four semesters of study or comparable proficiency. *Prerequisite:* LANG 2040 or equivalent.

**5300. Advanced Linguistics. 3.** Data is offered to provide the opportunity to analyze phonological, morphological, and syntactic materials from languages throughout the world. Attention is given to the limits within which these aspects of human language appear to vary. *Prerequisite:* ANTH/ENGL/LANG 4750.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Students are expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

## Other Languages (LANG)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

Modern languages not listed above are offered under the following listings in the class schedule:

**1010. First Semester in \_\_ 1-4 (Max. 12).**

**1020. Second Semester in \_\_ 1-4 (Max. 12).** *Prerequisite:* LANG 1010.

**2030. Third Semester in \_\_ 1-4 (Max. 12).** *Prerequisites:* LANG 1010, LANG 1020.

**2040. Fourth Semester in: \_\_ 3. [(none)◀▶H]** Encompasses formal grammar introduction and review; periodic composition; as well as drill of oral skill including pronunciation, oral reports and free conversation. *Prerequisite:* Satisfactory completion of corresponding study in LANG 2030.

## Latin (LATN)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

**1010. First Year Latin I. 4. [(none)◀▶H]** Studies fundamentals of grammar, composition and reading. (Offered fall semester)

**1020. First Year Latin II. 4. [(none)◀▶H]** Studies fundamentals of grammar, composition and reading. *Prerequisite:* LATN 1010 or equivalent. (Offered spring semester)

**2030. Second Year Latin. 4.** Reading simple texts, short stories and dramas, as well as grammar review and conversation. *Prerequisite:* LATN 1020 or equivalent. (Offered fall semester)

**3110 [2110]. Vergil, The Aeneid I. 3.** Reading portions of the Aeneid and consideration of its literary interpretation. *Prerequisite:* LATN 2030 or equivalent.

**3120 [2120]. Vergil, The Aeneid II. 3.** Reading further portions of the Aeneid and consideration of its literary interpretation. *Prerequisite:* LATN 3110. (Offered based on sufficient demand and resources)

**3140. Caesar. 2.** Acquaints students with war-memoir genre of Latin literature. *Prerequisite:* LATN 2030 or equivalent. (Offered based on sufficient demand and resources)

**3150. Livy. 3.** Reading portions of Livy's historical works, and consideration of the history he covers and how the Romans viewed their past. *Prerequisite:* 15 hours of college Latin or equivalent.

**3160. Ovid. 2.** *Prerequisite:* 15 hours of college Latin or equivalent. (Offered based on sufficient demand and resources)

**3990. Independent Study. 1-4 (Max. 12).** Books or texts of special interest to the student, selected in conjunction with the instructor; independent reading and reports. *Prerequisite:* LATN 2030 or equivalent. (Offered based on sufficient demand and resources)

**4110. Horace. 3.** *Prerequisite:* 15 hours of college Latin or equivalent. (Offered based on sufficient demand and resources)

**4115. Latin Philosophers. 3.** An introduction to Latin philosophical traditions. Readings will be selected either from one author, such as Lucretius (ca. 99-55 BCE) or Seneca the Younger (ca. 4 BCE-65 CE), or from different authors about a given theme. *Prerequisite:* 15 hours of college Latin or equivalent.

**4120. Catullus and the Elegiac Poets. 3.** Discusses Latin lyric poetry of late Republic and early Empire, excluding works of Horace and Ovid, and elegiac tradition in Latin. *Prerequisite:*

*quisite:* 15 hours of college Latin or equivalent. (Offered based on sufficient demand and resources)

**4130. Cicero. 3.** Introduction to the prose of the statesman Marcus Tullius Cicero (106-43 BCE). Readings will be selected from his political speeches, correspondences, or treatises on philosophical, rhetorical, and religious topics. *Prerequisite:* 15 hours of college Latin or equivalent.

## Russian (RUSS)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

**1000. Practical Russian. 1-3 (Max. 3).** Studies fundamentals of Russian grammar for reading comprehension in professional fields. Credit granted cannot be substituted for credit in RUSS 1010, 1020 or 2030. (Offered based on sufficient demand and resources)

**1005. Introduction to the Russian Sound System. 1 (Max. 2).** Introduces phonetics, alphabet and intonation. Fifteen 50-minute lab sessions. Offered S/U only.

**1010. First Year Russian I. 4. [(none)◀▶H]** Studies fundamentals of grammar, composition, conversation and reading. (Offered fall semester)

**1020. First Year Russian II. 4. [(none)◀▶H]** Studies fundamentals of grammar, composition, conversation and reading. *Prerequisite:* RUSS 1010 or two years of high school Russian. (Offered spring semester)

**2005. Russian Intonation, Phonetics and Pronunciation. 1 (Max. 2).** Reviews phonetics and intonation. For second year Russian students. Fifteen 50-minute lab sessions. Offered S/U only. *Prerequisite:* RUSS 1000 or 1010/1020.

**2030. Second Year Russian I. 4. [(none)◀▶H]** Grammar completion and conversation. *Prerequisite:* RUSS 1020 or three years of high school Russian. (Offered fall semester)

**2040. Second Year Russian II. 3. [(none)◀▶H]** Reviews grammar and conversation. *Prerequisite:* RUSS 2030. (Offered spring semester)

**2140. Introduction to Reading. 3. [CH,G◀▶(none)]** Introduction to reading Russian. Analyzes major media. *Prerequisite:* RUSS 2030 or three years of high school Russian. (Offered spring semester)

**3050. Third Year Russian I. 3. [(none)◀▶COM2]** Stresses usage of the language through composition, conversation, oral presentation and grammar review. *Prerequisite:* RUSS 2040 or three or four years of high school Russian. (Offered fall semester)



**3060. Third Year Russian II. 3.** Stresses usage of the language through composition, conversation, oral presentations and grammar review. *Prerequisite:* RUSS 3050. (Offered spring semester)

**3065. Topics in Russian Language. 3.** Encompasses special topics on aspects of Russian language. *Prerequisite:* RUSS 2030. (Offered either semester)

**3105. 20th Century Russian Literature in English. 3.** Studies classics of Soviet and Pre-Soviet eras. In English. *Prerequisite:* ENGL 1010. (Offered based on sufficient demand and resources)

**3150. Introduction to Literature. 3.** Examines literature of Russia. Analyzes major literary types and elements of criticism. *Prerequisites:* RUSS 2040 and 2140.

**3205. Russian Folklore and Folk life. 3. [CH,G◀(none)].** Devoted to the study of Russian Folklore and Folk Life, with an emphasis on verbal art. Students will read primary sources in English translations, as well as critical and theoretical works in order to identify differences and commonalities reflected in the multiform interactions recounted in the folktales globally. *Prerequisite:* WA.

**3990. Independent Study. 1-4 (Max. 4).** Encompasses books or periodicals of special interest to the student, selected in consultation with staff member. Includes independent reading and reports. *Prerequisite:* RUSS 2040.

**4070. Fourth Year Russian I. 3.** Advanced work in Russian syntax and phonetics. Introduces linguistic basis of the language with practical and literary composition and conversation. *Prerequisite:* RUSS 3060 or equivalent. (Offered fall semester)

**4080. Fourth Year Russian II. 3.** Advanced work in Russian syntax and phonetics. Introduces linguistic basis of the language with practical and literary composition and conversation. *Prerequisite:* RUSS 4070. (Offered spring semester)

**4090. Topics in Russian Linguistics. 3.** Covers topics in Russian grammar from historical perspectives. *Prerequisite:* RUSS 3050 or 3065.

**4105. 19th Century Russian Culture and Literature in English. 3.** Explores classics of Russian fiction of 19th century. In English. Dual listed with RUSS 5105. *Prerequisite:* WB course.

**4200. Senior Seminar. 3 (Max. 6). [(none) ▶COM3]** Discusses topic which varies from semester to semester. Minimum of 3 hours recommended for majors. *Prerequisite:* 12 hours of 3000- and 4000-level courses in the subject or instructor's consent.

**4990. Advanced Independent Study. 1-3 (Max. 9).** Students develop program of independent study in conjunction with instructor. *Prerequisite:* RUSS 3060 or equivalent.

**5105. Nineteenth Century Russian Culture and Literature in Translation. 3.** Presents the classics of Russian fiction of the nineteenth century (read in English). Dual listed with RUSS 4105. *Prerequisite:* ENGL 1010, 1020.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status..

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

## Spanish (SPAN)

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB▶▶Q]).**

**1010. First Year Spanish I. 4. [(none)▶▶H]** Studies fundamentals of grammar, composition, conversation and reading.

**1020. First Year Spanish II. 4. [(none)▶▶H]** Studies fundamentals of grammar, composition, conversation and reading. *Prerequisite:* SPAN 1010 or two years of high school Spanish.

**1101. First-Year Seminar. 3. [(none)▶▶FYS]**  
**2030. Second Year Spanish I. 4. [(none)▶▶H]** Encompasses reading, grammar review, compositions and conversation. *Prerequisite:* SPAN 1020 or three years of high school Spanish.

**2040. Second Year Spanish II. 4. [(none)▶▶H]** Stresses usage of the language through composition, conversation, oral presentation and grammar review. *Prerequisite:* SPAN 2030 or three years of high school Spanish.

**2140. Introduction to Literature. 3. [CH,G▶▶(none)]** Introduces Hispanic literature. Analyzes major literary types and elements of criticism. *Prerequisite:* SPAN 2030 or equivalent.

**3040. Spanish Conversation. 3.** Emphasizes speaking and listening comprehension through structured and monitored individual, pair, small group and class work, while providing socio-cultural competence, vocabulary acquisition and grammar review. Provides enhanced language skills in a manner that otherwise could only be attained through an extended stay in a Hispanic country. *Prerequisite:* SPAN2040; limited to Spanish majors/minors with no previous experience abroad.

**3050. Third Year Spanish I. 3. [WB▶▶COM2]** Stresses usage of the language through composition, conversation, oral presentation and grammar review. *Prerequisite:* SPAN 2040.

**3060. Third Year Spanish II. 3.** Intensively reviews grammar and composition-skill development. Also emphasizes specialized lexicons, written and oral translation, as well as conversational fluency. *Prerequisite:* SPAN 3050.

**3070. Intensive Spanish Abroad. 3.** Three-week intensive Spanish language study in private language schools throughout Latin America and Spain. Program includes four hours of class per day in classes of four to eight students per teacher, room and board with host family and UW faculty escort. *Prerequisite:* SPAN 2030.

**3080. Southwest Spanish. 3.** Examines the dialects of Southwest Spanish and explores their development from the Spanish conquest to the present, focusing on the linguistic systems themselves as well as on the historical, political and social factors that have influenced the development of the various dialects. Cross listed with CHST 3080. *Prerequisite:* SPAN 1020 or equivalent proficiency.

**3100. Survey of Spanish Literature. 3.** Studies Spanish literature from the Middle Ages to the end of the 17th century. *Prerequisite:* SPAN 2140 or equivalent.

**3120. Survey of Spanish American Literature. 3. [G▶▶(none)]** Surveys Spanish American literature from colonial period to the present. *Prerequisite:* SPAN 2140 or equivalent.

**3200. Spanish Culture and Civilization. 3.** Studies the evolution of Spanish culture through its main artistic, sociological and intellectual expressions. *Prerequisite:* SPAN 2040, 2140.

**3220. Spanish-American Cultures in Context. 3.** Introduction to the Spanish-speaking cultures of Latin America and the United States through a historical overview and a focus on contemporary politics and culture. *Prerequisite:* SPAN 2040 or SPAN 2140 or consent of instructor.

**3990. Independent Study. 1-4 (Max. 4).** Encompasses books or periodicals of special interest to the student, selected in consultation with a staff member. Includes independent reading and reports. *Prerequisite:* SPAN 2030.

**4070. Fourth Year Spanish I. 3.** Intensively reviews grammar and composition-skill development. Also emphasizes specialized lexicons, written and oral translation and conversational fluency. *Prerequisite:* SPAN 3060.

**4080. Fourth Year Spanish II. 3 (Max. 9).** Encompasses special topics in language such as syntax, morphology, discourse and Spanish for special purposes (e.g. business, medicine).

**4090. Spanish Phonetics and History of the Language. 3.** Provides a practical guide to description and performance of Spanish phonological system and general survey of the language's historical development, as well as major dialectal variations. Dual listed with SPAN 5090. *Prerequisites:* SPAN 2030; SPAN 3050 and 3060 highly recommended.

**4095. Advanced Translation. 3 (Max. 6).** A practical approach to translating techniques and elements of oral interpretation. *Prerequisite:* SPAN 3060.

**4125. Spanish-Language Literatures of the Americas. 3 (Max. 9).** Examines Spanish American literature from a wide variety of perspectives: geographical regions (e.g. Caribbean, Andean, greater Mexico), theme (e.g. revolution, borders), period (e.g. Colonial, 19th century), or genre (e.g. poetry, theatre, film, non-fiction). *Prerequisite:* SPAN 3050 or equivalent. SPAN 3120 highly recommended.

**4130. Masterpieces of Spanish Renaissance Literature. 3.** Studies Spanish Renaissance, taking into consideration social, political, economic, religious, philosophical and aesthetic aspects of the culture as a context for and as reflected in the literature. Dual listed with SPAN 5130. *Prerequisite:* SPAN 2140 or equivalent.

**4140. Masterpieces of Spanish Baroque Literature. 3.** Studies Spanish Baroque, taking into consideration social, political, economic, religious, philosophical and aesthetic aspects of the culture as a context for and as reflected in the literature. Also covers relationship between Spanish Renaissance and Baroque. Dual listed with SPAN 5140. *Prerequisite:* SPAN 2140 or equivalent.

**4150. Spanish Romanticism. 3.** Comprehensively studies romantic movement in Spain. Includes close reading and commentary of texts by authors such as Espronceda, Rivas, Zorrilla, Becquer and de Castro. Dual listed with SPAN 5150. *Prerequisite:* SPAN 2140 or equivalent.

**4170. Contemporary Spanish Prose. 3.** Examines contemporary prose fiction of Spain. Studies authors who gained recognition before and after the 1936 Spanish Civil War. *Prerequisites:* SPAN 2140 or equivalent and one 4000-level course.

**4180. Advanced Cultural Studies in Hispanic Lit/Media. 3.** Advanced analysis of Hispanic cultural phenomena. Focus on the Spanish-speaking cultures of Spain or the Spanish-speaking Americas or both. The

Texts consulted vary according to instructor and may include the visual arts, such as film, paintings, and performance, academic theory, websites, and other fiction and non-fiction readings. Dual listed with SPAN 5180. *Prerequisites:* SPAN 2140 or equivalent and one 4000-level course.

**4190. 20th and 21st Century Spanish-American Texts. 3.** Provides students the opportunity to study representative literary texts that reflect the tendencies and trends in 20th and 21st Century Spanish-language works of the Americas. Dual listed with SPAN 5190. *Prerequisite:* 6 hours of Spanish literature at 4000-level.

**4200. Introduction to Research. 3 (Max. 9).** [WC◀COM3] Senior seminar on a topic varying from year to year. Includes study of standard bibliographical guides. Minimum of 3 hours recommended for majors. *Prerequisite:* 12 hours of 4000- or 5000-level courses in Spanish.

**4260. The Realist Novel in Spain. 3.** Studies major novelists of 19th century Spain from 1850 until Generation of '98. Dual listed with SPAN 5260. *Prerequisite:* SPAN 2140 or equivalent.

**4310. Introduction to Hispanic Linguistics. 3.** Overview of basic concepts and approaches to linguistics with examples from and emphasis on Spanish description. Basic concepts in semiotics, formal and non-formal linguistics, core areas in linguistics (phonetics & phonology, morphosyntax, semantics & pragmatics), as well as an overview of subfields of linguistics (psycholinguistics, sociolinguistics, computational linguistics, etc.). *Prerequisites:* SPAN 3050 or equivalent proficiency.

**4990. Advanced Independent Study. 1-3 (Max. 6).** Encompasses special projects to meet needs of individual students, designed in consultation with instructor. *Prerequisites:* SPAN 2040 and consent of instructor.

**5090. Spanish Phonetics and History of the Language. 3.** A practical guide to the description and performance of the Spanish phonological system and a general survey of the language's historical development as well as its major dialectal variations. Dual listed with SPAN 4090. *Prerequisite:* SPAN 2030; SPAN 3050 and 3060 highly recommended.

**5100. Hispanic Thought. 3.** intensive study of a topic, author, or philosophical movement. Designed for upper level and graduate students. *Prerequisite:* 12 hours of Spanish literature at 4000-5000 level.

**5110. Peninsular Spanish Literature. 1-3 (Max. 9).** An intensive study of a topic or an author. Designed for upper level and graduate students. *Prerequisite:* 12 hours of Spanish literature at 4000-5000 level.

**5120. Spanish American Literature. 1-3 (Max. 9).** An intensive study of a topic or an author. Designed for upper level and graduate students. *Prerequisite:* 12 hours of Spanish literature.

**5130. Masterpieces of Spanish Renaissance Literature. 3.** A study of the Spanish Renaissance, taking into consideration social, political, economic, religious philosophical, and aesthetic aspects of the culture as a context for and as reflected in the literature. Dual listed with SPAN 4130. *Prerequisite:* SPAN 2140 or equivalent.

**5140. Masterpieces of Spanish Baroque Literature. 3.** Studies of the Spanish Baroque, taking into consideration social, political, economic, religious, philosophical, and aesthetic aspects of the culture as a context for and as reflected in the literature. Also covers the relationship between the Spanish Renaissance and the Baroque. Dual listed with SPAN 4140. *Prerequisite:* SPAN 2140 or equivalent.

**5150. Spanish Romanticism. 3.** A comprehensive study of the romantic movement in Spain. Close reading and commentary of texts by representative authors including Espronceda, Rivas, Zorrilla, Becquer and de Castro. Dual listed with SPAN 4150. *Prerequisite:* SPAN 2140 or equivalent.

**5160. Graduate Readings. 1-5 (Max. 6).** *Prerequisite:* graduate standing.

**5170. Special Problems. 1-2 (Max. 6).** *Prerequisite:* graduate standing.

**5180. Advanced Cultural Studies in Hispanic Lit/Media. 3.** Advanced analysis of Hispanic cultural phenomena. Focus on the Spanish-speaking cultures of Spain or the Spanish-speaking Americas or both. The Texts consulted vary according to instructor and may include the visual arts, such as film, paintings, and performance, academic theory, websites, and other fiction and non-fiction readings. Dual listed with SPAN 4180. *Prerequisite:* SPAN 2140 or equivalent and one 4000-level course.

**5190. 20th and 21st Century Spanish-American Literature. 3.** Provides students with the opportunity to study representative literary texts that reflect the tendencies and trends in 20th and 21st Century Spanish-language works of the Americas. Dual listed with SPAN 4190. *Prerequisite:* 6 hours of Spanish at the 4000-level.

**5260. The Realist Novel in Spain. 3.** Studies of the major novelists of nineteenth century Spain from 1850 until the Generation of '98. Dual listed with SPAN 4260. *Prerequisite:* SPAN 2140 or equivalent.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Latina/o Studies (formerly Chicano Studies)

106 Ross Hall, 766-4127

**Web site:** [uwo.edu/ChicanoStudies](http://uwo.edu/ChicanoStudies)

**Director:** Dr. Cecilia Aragon

### Associate Professors:

**CECILIA J. ARAGON**, B.S. McMurry University Texas; M.A. University of New Mexico; Ph.D. Arizona State University; Associate Professor of Theatre and Dance 2005.

### Assistant Professors:

**VANESSA FONSECA**, B.A. University of New Mexico 2005; M.A. 2007; Ph.D. 2013; Assistant Professor of English and Latina/o Studies.

**LILIA SOTO**, B.A. University of California, San Diego 2000; M.A. University of California, Berkeley 2003; Ph.D. 2008; Assistant Professor of American Studies and Latina/o Studies 2010.

The Latina/o Studies program, through an interdisciplinary and comparative approach examines the history, cultures, language and contemporary experiences of Mexicans, Mexican Americans and other Latinos/as in Wyoming, the United States and the world.

The Latina/o Studies Program offers an academic minor. Information about the Latina/o Studies Program and minor can be obtained from the Latina/o Studies Program office located in the Arts and Sciences Building, room 326, (307) 766-4127.

### Learning Outcomes

Latina/o Studies courses emphasize perspectives that are historical and contemporary, theoretical and practical, as well as critical and aesthetic. These perspectives help to develop an understanding of oppression and resistance, at the individual, institutional, and ideological levels.

Upon completion of the University of Wyoming Latina/o Studies minor curriculum, students will have an awareness and appreciation for the Latina/o experience. Particularly as the Latina/o experience is expressed in the following concepts and principles of organic insight, relational awareness, historical perspective, power for social change, intersectionality, and aesthetics.

1. *Organic Insight* - The development of a contextual framework for understanding one's own and others' experiences in relation to the Latina/o experience.

2. *Relational Awareness* - The development of a theoretical framework for understanding how institutional social structures impact individuals, families, and communities, and in turn, how individuals, families, and communities impact social structures through resistance, social agency, and change.

3. *Historical Perspective* - The development of a critical historical viewpoint for understanding how struggles around social, economic, and political forces have shaped the traditional and contemporary Latina/o Diaspora.

4. *Power for Social Change* - The development of a critical consciousness, which is necessary for a social praxis that combats oppressive racist ideologies and social structures that perpetuate individual and institutional inequalities.

5. *Intersectionality* - Gaining an awareness of the intersection of race, ethnicity, class, gender, and sexual orientation as it plays out organically, relationally, historically, and politically.

6. *Latina/o Aesthetics* - The development of an appreciation and awareness of the aesthetics evident in Latina/o art, music, theatre, literature, and other artistic expressive forms and styles.

## Graduate Study

At present, no program for graduate degrees in Latina/o Studies is offered; however, courses may be counted at the graduate level.

## Latina/o Studies (CHST)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**1030. Social Justice in the 21st Century.**

**3. [I,D♦(none)]** Appropriate for students interested in diversity and social justice. Topics covered through an interdisciplinary study of people and society range from identity, critical thinking, empowerment, role models, stereotyping, institutional discrimination, and tolerance. The key lynchpin is active participation in the development and maintenance of just communities. Cross listed with WMST/AIST/AAST/AMST 1030. Enrollment preference will be given to We The People FIG students.

**1100. Introduction to Chicano Studies. 3.**

**[CS,D♦(none)]** Provides a basic understanding of the historical, social, and cultural context of the Mexican American Chicano people. Examines the major theoretical and conceptual frameworks which explain the Mexican American Chicano experience. Examines the comparative relations with other groups and major social and policy issues. Provides an introduction to the conduct of research in field.

**1101. First-Year Seminar. 3. [(none)♦FYS]**

**1300. Introduction to Latina/o Studies. 3.**

**[(none)♦H]** The U.S. Latina/o immigrant experience is a particular focus of this course, including its role in the incorporation of Latinos into U.S. society. Through readings, presentations, class discussion, videos, and other activities, students examine historical and contemporary issues affecting Latinos including but not limited to immigration, language, identity, national origin, education, politics, employment, and economic mobility.

**2001. Gender and Ethnicity in Science. 3.**

Covers factors affecting the performance and retention of women and ethnic minority students in science careers, and science as a social construct. Cross listed with WMST 2001.

**2060. Special Topics in \_\_\_\_\_. 3.** Special topics course through which regular or visiting faculty can present progress regarding specialized or new topics.

**2360. Mexican American Literature. 3.**

**[CH,D♦(none)]** Discusses literary reflections of Chicanismo. Studies literature of the Hispanic Southwest, Mexican American folklore and the Chicano and post-Chicano movement. Cross listed with ENGL 2360.

*Prerequisite:* WA.

**2370. Chicano History : Origins to 1900. 3. [CS,D] (none)** General survey that traces the geographic distribution and historical processes that have shaped the life experiences, socio-economic development and cultural contributions of peoples of Mexican descent in the United States from their indigenous and Hispanic origins to the end of the 19<sup>th</sup> century. Cross list with GEOG 2370/HIST 2370.

**2385. Chicano History: 1900 to Present. 3.** General survey of the history of the Mexican American Chicano people in the United States. Examines the origins and development of Mexican Americans, Chicanos through the major historical processes which have shaped their experience. Major themes include multi-cultural, multiethnic context, origins; changing identity, comparative relations to other social, ethnic groups, culture, social structure, politics, economy, immigration, and the influence of United States-Mexico relations. Cross listed with HIST 2385.

**3080. Southwest Spanish. 3.** Examines the dialects of Southwest Spanish and explores their development from the Spanish conquest to the present, focusing on the linguistic systems themselves as well as on the historical, political and social factors that have influenced the development of the various dialects. Cross listed with SPAN 3080. *Prerequisite:* SPAN 1020 or equivalent proficiency.

**3200. Perspectives in Chicana Studies 3. [D] (none)** An interdisciplinary introduction to the study of the history, culture, gender relations, and contemporary political, economic status of Chicanas/Mexican American women. Examines the origins, development of Chicana studies as a major emphasis in Chicano/Chicana studies. Cross listed with WMST 3200. *Prerequisite:* CHST 1100 or junior standing.

**3560. Chicano Community Organizations. 3.** Introduction to the origins, development and contemporary status of community organizations and service agencies in the Mexican American community in general and in the Wyoming and Rocky Mountain regions. *Prerequisite:* CHST 1100.

**3800. Chicanas/os in Contemporary Society. 3. [CS,D] (none)** Focuses on three major movements within the Chicana/o community; labor, nationalism, and feminism. Students will assess these three movements to determine what role they have played in transforming the social conditions and political identity of the Chicana/o and Latina/o population in the US. Cross listed with AMST/WMST 3800. *Prerequisites:* CHST 1100 or WMST 1080 or AMST 2010.

**4100. U.S. Latina/o Theater. 3. [CA,D] (none)** Designed to provide an overview of United States Latina/o Theater. Through a variety of delivery methods, students are instructed on the various categories that directly impact U.S. Latina/o Theater such as political theatre, gay/lesbian theatre, border issues, race, class, gender, and sexuality. Cross listed with WMST 4100. Dual listed with CHST 5100. *Prerequisite:* 6 hours of CHST or WMST.

**4470. Studies in Chicano Folklore. 3. [CH,D] (none)** Provides a survey of the origins, development and contemporary folklore of the Mexican American Chicano people of the United States with comparative relation to Mexico and other groups in the United States. Cross listed with ENGL 4470. *Prerequisites:* CHST 1100 and WA.

**4485. U.S. Latino Diaspora. 3.** Combines classroom activities and a week-long stay abroad in examining the historical creation and contemporary spread of the Latino Diaspora from the Caribbean to the Yucatan and beyond. U.S. Latina/o history, multiculturalism, pan-Latino identity, assimilation, migration trends and natives responses are stressed. Cross listed with HIST/INST 4485. *Prerequisite:* 9 hours of CHST, HIST, and/or INST related coursework.

**4496. History of Mexico. 3.** Intensive course in Mexican development. Emphasizes the 20th century, especially the Mexican Revolution of 1910, showing how this nation transformed itself into a modern nation-state. Includes diplomatic relations with the U.S., incorporation of Indians, church-state relations, uses of land and other natural resources, role of the military and growth of Mexican nationalism. Cross listed with HIST 4496. *Prerequisite:* HIST 2380. (Normally offered fall semester)

**4525. American Southwest. 3.** Explores the Southwest as the location of cultural encounters and conflicts. Focuses on the cross-cultural interchange between American Indians, Mexican Americans and Anglo Americans from the fifteenth century to the present. Cross listed with AIST/HIST 4525. *Prerequisite:* HIST 1210/1211, 1220/1221. (Normally offered spring semester)

**4546. Agriculture: Rooted in Diversity. 3. [C,D] (none)** Addresses multiple themes related to diversity in agriculture with the goal of making visible the experiences of minorities and women in agriculture. Involves significant independent research, class discussion, project development, and development of oral and written communication skills. Establishes link-

ages with supporting disciplines. Cross listed with AGRI/AIST/ENGL/FCSC/HIST/AMST 4546. *Prerequisites:* junior class standing or consent of instructor and concurrent enrollment or major in any of the following: ethnic studies, agriculture, American studies, anthropology, English, history, sociology, or women's studies.

**4650. Women, Gender & Migration. 3.** From an international context and perspective, this course examines the gendered transformations immigrant women experience. Gender, theories of international migration, assimilation, race, ethnicity, and identity transformation serve as categories of analysis. From a cross-discipline comparative approach, we focus on women's lives to examine differences and similarities to complicate notions of immigration. Cross listed with AMST/INST/WMST 4650. Dual listed with CHST 5650. *Prerequisites:* Junior standing and 6 hours of AMST, CHST, INST, and/or WMST coursework or instructor approval.

**4675. U.S. Women of Color. 3. [D] (none)** Examines in comparative perspective the social conditions that shape the experiences of Chicanas/Latinas in the U.S. Students gain an understanding of how the intersection of race, class, gender, and sexuality shape the lived experiences of U.S. women of color through ideological, economic, and political forces. Cross listed with AAST/WMST 4675. *Prerequisite:* junior standing and/or a combination of 3-6 hours of any level of CHST, WMST, or AAST coursework.

**4975. Independent Studies. 1-3 (Max 6).** Independent study in Chicano studies research. *Prerequisite:* junior standing.

**4990. Topics in Chicano Studies. 1-3 (Max 6).** A special topics course through which regular and visiting faculty can explore regarding specialized or new research topics regarding Chicano studies. *Prerequisite:* junior standing.

**5100. U.S. Latina/o Theater. 3. [CA,D] (none)** Designed to provide an overview of United States Latina/o Theater. Through a variety of delivery methods, students are instructed on the various categories that directly impact U.S. Latina/o Theater such as political theatre, gay/lesbian theatre, border issues, race, class, gender, and sexuality. Cross listed with WMST 5100. Dual listed with CHST 4100. *Prerequisite:* 6 hours of CHST or WMST.

**5650. Women, Gender & Migration. 3.** From an international context and perspective, this course examines the gendered transformations immigrant women experience. Gender, theories of international migration, assimila-

tion, race, ethnicity, and identity transformation serve as categories of analysis. From a cross-discipline comparative approach, we focus on women's lives to examine differences and similarities to complicate notions of immigration. Cross listed with AMST/INST/WMST 5650. Dual listed with CHST 4650. *Prerequisites:* Junior standing and 6 hours of AMST, CHST, INST, and/or WMST coursework or instructor approval.

## Life Sciences Program

138 Aven Nelson Building, 766-4158

FAX: (307) 766-2851

Web site: [www.uwyo.edu/lifescience](http://www.uwyo.edu/lifescience)

Program Director: Mark E. Lyford

The Life Sciences Program consists of all LIFE prefix courses. These courses support the life science majors and several non-life science majors across campus. The number of LIFE courses taken by life science and other majors is determined by the departments that offer the majors. The curriculum intends to provide life-science majors with both breadth and depth in the basic life sciences, and non-science majors with exposure to key concepts in biology and an understanding of the connections between science and society. The program courses also expose students to the fields of cell and molecular biology, genetics, ecology, and evolution, and they familiarize students with the diversity of life on the planet. Courses within the curriculum address four fundamental goals at a level appropriate for each course:

- 1) Acquisition, Application and Synthesis of Knowledge
- 2) Communication Skills
- 3) Critical Thinking and Problem Solving
- 4) Research Skills

## Life Sciences (LIFE)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

**1001 [BIOL 1001]. Biology as Culture. 2. [I,L◀▶(none)]** Introduces Life Science majors to the role of modern biology in society, the methods biologists use to generate knowledge, methods of accessing data, use of data, and the relationship between biology and other sciences. (Normally offered fall semester)

**1002 [BIOL 1002]. Discovering Science. 4. [S▶PN]** Integrates Biology, Chemistry, Physics, and Earth Science for non-science majors. Fundamental concepts from each

discipline are concurrently addressed through lectures, while weekly laboratory activities and discussion groups enable students to learn how to do science and place it into larger societal issues. *Prerequisites:* none. (Normally offered fall semester)

**1003 [BIOL 1003]. Current Issues in Biology. 4. [SB◀▶PN]** Emphasizes central themes of biology – cell biology, genetics, evolution, ecology – and scientific methodology by focusing on current issues in biology. Taught in 3 two-hour blocks of lecture/discussion each week, with one usually devoted to laboratory explorations. Students cannot receive duplicate credit for LIFE 1000, 1010 or 1020. *Prerequisites:* none. (Normally offered spring semester)

**1010 [BIOL 1010]. General Biology. 4. [SB◀▶PN]** Fundamental concepts of biology, including basic chemistry of living systems, cell structures and functions, energy relations, genetics, molecular biology, ecology, population dynamics and evolutionary theory. Living invertebrate and vertebrate organisms studied during some lab meetings. Laboratory is required. Students who have credit in LIFE 1000, 1003, or 1020 may not receive duplicate credit for this course. *Prerequisite:* grade of C or better in MATH 0921 or level 2 on the Math Placement Exam or math ACT of 21 or math SAT of 600. (Normally offered fall and spring semester)

**1020 [BIOL 1020]. Life Science. 4. [SB◀▶PN]** An integrated lab and lecture emphasizing fundamental principles of biology including cell structure and function, genetics, ecology, evolution and organismal biology. Considers applications of these principles to societal issues such as the conservation of biodiversity, overpopulation and global environmental changes, biotechnology, and human wellness and disease. Duplicate credit will not be given for LIFE 1000, 1003, or 1010. *Prerequisites:* elementary education majors only; concurrent enrollment in EDEL 1430. (Normally offered fall and spring semesters)

**2002 [BIOL 2002]. Global Ecology. 3. [SB,G◀▶(none)]** Provides a global perspective on ecological processes, biodiversity, climate change, and the environmental consequences of human actions. Students develop a global awareness of the role of ecology in international human affairs, and how this influences relationships between the developed and developing worlds. For majors and non-majors. *Prerequisite:* LIFE 1002, 1003, or 1010.

**2022 [BIOL 2022]. Animal Biology. 4.** An integrative course addressing the evolution, anatomy, physiology, and ecology of animals. Continues building upon the four themes in

LIFE 1010, cell and molecular biology, genetics, evolution, and ecology. Preserved animal specimens are dissected during some labs. Intended for students majoring in the life sciences. Laboratory is required. *Prerequisite:* LIFE 1010 with a grade of C or better. (Normally offered spring semester)

**2023 [BIOL 2023]. Biology of Plants and Fungi. 4.** An integrated course dealing with the central themes of biology including cell and molecular biology, genetics, evolution and ecology of plants and fungi. Intended for students majoring in the life sciences. Laboratory is required. *Prerequisite:* LIFE 1010 with a grade of C or better. (Normally offered fall semester).

**2050 [BIOL 2050]. Biology of Aging and Human Development. 3.** Reviews cellular, physiological, endocrine, anatomical and nutritional aspects to aging. Format relates topics, such as exercise, nutrition and evolution, to aging. Students gain insight to problems related to research in aging and its potential impact on society. Uses video-taped lectures from field experts. *Prerequisite:* LIFE 1010. (Normally offered spring semester)

**3050 [BIOL 3050/BIOL 4000]. Genetics. 4.** Introduces principles of heredity and variation in living organisms, including a study of the nature of the genetic material and its transmission, influence of heredity and environment on the development of individual characters, as well as evolution of organisms and artificial selection of plant and animal varieties. Emphasizes application to today's society. *Prerequisite:* completion of LIFE 1010 and one of LIFE 2022, 2023, or MICR/MOLB 2021 with a grade of C or higher in each. (Normally offered fall and spring semester)

**3400 [BIOL 3400/ BIOL 2400]. General Ecology. 3.** Presents fundamental concepts in population and ecosystem ecology to both majors and non-majors. Emphasizes basic principles and their use in manipulated ecosystems. *Prerequisite:* completion of LIFE 1010 and one of LIFE 2022, 2023, or MICR/MOLB 2021 with a grade of C or higher in each. (Normally offered fall and spring semesters)

**3410 [BIOL 3410/BIOL 2410]. Introduction to Field Ecology. 2.** Field and laboratory course. Introduces methods used in plant and animal ecology. *Prerequisite:* LIFE 3400 (may be concurrently enrolled). (Normally offered fall semester)

**3500 [BIOL 3500]. Evolutionary Biology. 3.** Presents modern evolutionary theory. Examines evolution and evolutionary mechanisms from several viewpoints, with particular attention given to genetic mechanisms under-

lying processes of evolution and speciation. *Prerequisites:* completion of LIFE 1010, one of LIFE 2022, 2023, or MICR/MOLB 2021, and LIFE 3050 with a grade of C or higher in each. (Normally offered fall semester)

**3600 [BIOL 3600/ BIOL 4600]. Cell Biology. 4.** Focuses on cell structure, cell function and the regulation of cell processes. Examines many levels of organization, ranging from single molecules and individual cells to multicellular systems and the whole organism. Discussion section is required. *Prerequisites:* completion of LIFE 1010 and one of LIFE 2022, 2023, or MICR/MOLB 2021 with a grade of C or higher in each, and one semester of Organic Chemistry.

**4975 [BIOL 4975]. Practicum in Laboratory Teaching. 1-3 (Max. 3).** Intended to give undergraduate students experience teaching in a laboratory setting. Working closely with an instructor and a graduate teaching assistant, students will assist in the teaching of biology laboratories during the semester and participate in weekly sessions centered on teaching, learning, and assessment. *Prerequisites:* completion of a 1000-level LIFE course and consent of instructor.

**4976 [BIOL 4976]. Practicum in Laboratory Teaching II. 1-3 (Max 3).** Intended to build on the foundation of Biology 4975. Students would work under the dual supervision of the course instructor and the graduate teaching assistant to gain further first-hand experience with teaching in biology laboratories during the semester. *Prerequisite:* LIFE 4975.

## Mathematics

202 Ross Hall, 766-4221

FAX: (307) 766-6838

Web site: [www.uwyo.edu/math](http://www.uwyo.edu/math)

Department Head: Farhad Jafari

### Professors:

**MYRON B. ALLEN III**, A.B. Dartmouth College 1976; M.A. Princeton University 1978; Ph.D. 1983; Professor of Mathematics 1992, 1983.

**CRAIG C. DOUGLAS**, B.A. University of Chicago 1977; M.S. Yale University 1977; M.Phil. 1980; Ph.D. 1982; SER Professor of Mathematics 2008.

**STEFAN HEINZ**, B.S. Humboldt University 1986; M.S. Heinrich-Hertz University 1986; Ph.D. 1990; Professor of Mathematics 2013, 2004.

**FARHAD JAFARI**, B.S. University of Wisconsin-Madison 1978; M.S. 1980; Ph.D. 1983; M.A. 1986; Ph.D. 1989; Professor of Mathematics 1999, 1991.

**G. ERIC MOORHOUSE**, B.S. University of Toronto 1980; M.S. 1984; Ph.D. 1987; Professor of Mathematics 2011, 1989.

**PETER POLYAKOV**, M.S. Moscow State University 1967; Ph.D. 1971; Professor of Mathematics 1998, 1993.

**BRYAN L. SHADER**, B.S. University of Wyoming 1984; M.S. University of Wisconsin-Madison 1987; Ph.D. 1990; Professor of Mathematics 2000, 1990.

### Associate Professors:

**CHARLES ANGEVINE**, B.S. Brown University 1980; Ph.D. Cornell University 1983; Associate Professor of Mathematics 1989, 1984.

**HAKIMA BESSAIH**, M.S. University of Algiers 1992; Ph.D. Scuola Normale Superiore of Pisa 1999; Associate Professor of Mathematics 2008, 2004.

**MICHELLE T. CHAMBERLIN**, B.S. Colorado State University 1997; M.S. 1999; Ph.D. Purdue University 2002; Associate Professor of Mathematics 2012, 2007.

**FREDERICO da CUNHA FURTADO**, B.S. Federal University of Minas Gerais 1979; M.S. Federal University of Rio de Janeiro 1984; Ph.D. Courant Institute 1989; Associate Professor of Mathematics 2002, 1997.

**VICTOR GINTING**, B.S. Institut Teknologi Bandung Indonesia 1995; M.S. Texas A&M University 1998; Ph.D. 2004; Associate Professor of Mathematics 2012, 2007.

**CHRISTOPHER HALL**, B.S. University of Colorado, Boulder 1997; Ph.D. Princeton University 2003; Associate Professor of Mathematics 2013, 2009.

**SYLVIA A. HOBART**, B.A. University of California-Santa Cruz 1980; Ph.D. University of Michigan 1987; Associate Professor of Mathematics 1993, 1987.

**LYNNE IPINA**, B.S. South Dakota State University 1972; M.S. New York University 1978; Ph.D. 1986; Associate Professor of Mathematics 1992, 1985.

**LONG LEE**, B.S. National Taiwan University, Taipei 1988; M.A. University of Maryland 1998; Ph.D. University of Washington 2002; Associate Professor of Mathematics 2011, 2005.

**GREGORY LYNG**, B.A. Saint Olaf College 1996; M.A. Indiana University 1999; Ph.D. 2002; Associate Professor of Mathematics 2010, 2005.

**CHANYOUNG LEE SHADER**, B.S. Yonsei University 1985; M.A. University of Wisconsin-Madison 1991; Ph.D. 1992; Associate Professor of Mathematics 1999, 1992.

**DAN STANESCU**, B.Eng. Polytechnic Institute, Romania 1986; M.Eng. McGill University, 1994; Ph.D. Concordia University 1999; Associate Professor of Mathematics 2008, 2003.

**JASON WILLIFORD**, B.A. University of Pennsylvania 1998; Ph.D. University of Delaware 2004; Associate Professor Mathematics 2014, 2012.

**MAN-CHUNG YEUNG**, B.S. Jinan University, China 1986; M.Ph. University of Hong Kong 1990; Ph.D. University of California-Los Angeles 1997; Associate Professor of Mathematics 2005, 2001.

### Assistant Professors:

**RONGSONG LIU**, B.A. Henan Normal University 1999; M.A. Fudan University 2002; Ph.D. York University 2006; Assistant Professor of Mathematics and Program in Ecology 2009.

**TYRRELL McALLISTER**, B.S. University of California, Davis 2001; Ph.D. 2006; Assistant Professor of Mathematics 2009.

**ZHUANG NIU**, B.S. Wuhun University 1998; M.S. 2001; Ph.D. University of Toronto 2005; Assistant Professor of Mathematics 2012.

### Senior Lecturers:

**JOHN SPITLER**, B.S. Vanderbilt University 1977; M.S. University of Wyoming 1998; Assistant Research Scientist 1994; Senior Lecturer in Mathematics 2009, 2000.

**WILLIAM WEBER**, B.S. University of Wyoming 1988; M.S. 1992; Senior Lecturer in Mathematics 2012, 2001.

### Associate Lecturers:

**DAVID ANTON**, B.S. North Dakota State University 2001; M.S. University of Wyoming 2007; Associate Lecturer in Mathematics 2012, 2005.

**JEFFREY SELDEN**, B.S. New Mexico State University 1998; Ph.D. University of Arizona 2004; Associate Lecturer in Mathematics 2014, 2009.

### Assistant Lecturers:

**NATHAN CLEMENTS**, B.S. Brigham Young University-Idaho 2007; M.S. Idaho State University 2009; D.A. 2012; Assistant Lecturer in Mathematics 2012.

**CYNTHIA VADNAIS**, B.S. University of Wyoming 1987; Assistant Lecturer in Mathematics 1992.

### Adjunct Professors:

John Hitchcock, Robert Kansky, Dan Marchesin, John McInroy, Michael Pernice, Richard Shumway, Shaochang Wo.

**Professors Emeriti:**

Leonard Asimow, Robert Buschman, Benito M. Chen-Carpentier, George C. Gastl, John H. George, Syed Husain, Eli Isaacson, Terry Jenkins, A. Duane Porter, Ben G. Roth, John Rowland, Raymond Smithson.

**“For the things of this world cannot be made known without a knowledge of mathematics.”--Roger Bacon**

Virtually every student at UW will take one or more math courses to fulfill graduation requirements. The intent is to illustrate the esthetics inherent in mathematics, and to provide students with the quantitative skills needed for today's careers.

Mathematics majors receive a broad and deep view of the mathematical sciences. They develop their mathematical thinking and communications skills in algebra, analysis, and applied math. They learn a variety of technological tools necessary for jobs in education, business, government, and industry. In addition to our math classes, the department offers a variety of opportunities to enrich the undergraduate experience. Students can participate in weekly seminars, summer research projects, Putnam Team competitions, and the math club.

**Mathematics Placement**

All UW math courses have prerequisites which are detailed in the course listings below. These are to assure that each student has the best possible opportunity for success in the course. In accordance with this, *all students registering for a math course will have their records checked in order to determine whether the prerequisite is satisfied.*

A computerized prerequisite check is run prior to the start of every semester. *Students who preregistered for a math course but have not satisfied the prerequisites at the time of the check will be automatically dropped from the course.*

Prerequisites for courses numbered 2200 or lower (except 1105 and 2120), and 2350 (Business Calculus), may be satisfied in one of four ways:

1. Obtain a grade of C or better in a prerequisite course. Note that non-credit courses from out-of-state colleges are not accepted as prerequisites.
2. Pass the Mathematics Placement Exam (MPE) at the stated level within one year of the start of the course.

3. Obtain a sufficiently high score on one of the following standardized exams within three years of the start of the course: ACT composite math score or SAT quantitative score.

4. Obtain a sufficiently high score on one of the following standardized exams: AP Calculus, CLEP, or IB.

More information on mathematics placement may be obtained from the Center for Advising on Mathematics Placement (CAMP), 202 Ross Hall, 766-4221, or at [www.uwyo.edu/mpe](http://www.uwyo.edu/mpe).

**Duplication of Courses**

To avoid loss of credit because of duplication of course content, please note the following: (a) students who have taken MATH 1450 should not take MATH 1400 or MATH 1405; (b) students who have taken MATH 1400 and MATH 1405 should not take MATH 1450; (c) students who have had MATH 1400 may enroll in MATH 1450; however, only two additional hours of credit will be granted.

**Undergraduate Major**

A degree in mathematics should prepare students to enter either graduate studies or the workforce with a skill set that could only come from an intense study of both quantitative reasoning and rigorous proof. This can be accomplished by focusing on the following goals for our undergraduate major:

1. Develop mathematical thinking and communication skills
2. Develop skills with a variety of technological tools
3. Provide a broad view of the mathematical sciences
4. Require study in depth

The required lower division core courses for a mathematics major are Calculus 1, 2, and 3 (MATH 2200,2205,2210), Differential Equations (MATH 2310), Linear Algebra (MATH 2250), and the Math Major Seminar (MATH 2800).

At the upper division, all mathematics majors must take Analysis 1 (MATH 3205), Algebra 1 (MATH 3500) and Introduction to Scientific Computing (MATH 3340). These courses, known as the transition courses, introduce students to the three main areas of mathematics research currently represented in the department.

Every mathematics major must select one two-course sequence (MATH 4200/4205, MATH 4510/4520, or MATH 4340/4440)

that builds on the corresponding transition course. This sequence provides the student with an opportunity to study one of these areas in greater depth.

Finally, an additional 12 credits of upper division math courses (3000 and above) are required. It is recommended that these courses be selected to provide a broad view of mathematics.

Two of the math electives may be chosen from a list of approved courses that have significant math content, upon approval by the student's advisor. More details about such courses are available on the math department's web site, [math.uwyo.edu](http://math.uwyo.edu).

Only grades of C or better will be accepted for the major.

**Undergraduate Minor**

The minor in mathematics focuses on fundamental aspects of mathematics that are essential for further study in mathematics and are also useful in a variety of other disciplines. Students minoring in mathematics may customize the minor by choosing the appropriate transition course and upper-division electives to match their needs.

The required lower division core courses for a mathematics minor are Calculus 1, 2, and 3 (MATH 2200,2205,2210), Differential Equations (MATH 2310), Linear Algebra (MATH 2250), and the Math Major Seminar (MATH 2800).

At the upper division, all mathematics minors must take ONE of Analysis 1 (MATH 3205), Algebra 1 (MATH 3500) or Introduction to Scientific Computing (MATH 3340), as well as 6 additional credits of upper division math courses (3000 and above).

Two of the math electives may be chosen from a list of approved courses that have significant math content, upon approval by the student's advisor. More details about such courses are available on the math department's web site, [math.uwyo.edu](http://math.uwyo.edu).

Only grades of C or better will be accepted for the minor.

**Undergraduate Interdisciplinary Computational Science Minor**

In recognition of the importance of modeling and simulation in an increasing number of applications, the Undergraduate Interdisciplinary Computational Science Minor is intended to help prepare science, math, and engineering students for leading roles in their professions.

The Undergraduate Minor in Computational Science is based on the following requirements:

1. The student must earn 15 credit hours in specified courses.
2. Within the 15 credits, the student must earn 9 credits at the upper-division level (3000 or above).
3. Within the 15 credits, the student must earn 6 credits outside of her/his major.
4. Within the 15 credits, the student must earn at least 6 credits in core courses.
5. Only grades of C or better will be accepted for the minor.

The 15 hours of coursework are divided between core and elective courses as listed below.

#### **Core Courses:**

- Numerical Analysis (Math 4340/COSC 4340)
- High-Performance Computing (Offered as a topics course).
- Scientific Computing (MATH 3340/COSC 3340).
- Statistical Computing and Modeling (STAT 4460).

#### **Elective Courses**

- Computational Biology (BOT 4550/5550)
- Algorithms and Data Structures (COSC 3020)
- Mathematical and Computational Methods in Physics (PHYS 4840)
- Molecular Modeling (CHEM 4560/5560)
- C with Numerical Methods for Engineers (ES 3070)
- Mathematical Modeling (MATH 4300)
- Introduction to Finite Element Methods (ME 4040)
- Principles of Database Systems (COSC 4820)

## **Graduate Study**

The Department of Mathematics offers programs leading to the degrees of master of arts, master of science, master of arts in teaching, master of science in teaching, and the doctor of philosophy.

The requirements for these degrees reflect our belief that mathematicians should have a broad foundation in the core areas of algebra, analysis, and applied mathematics as well as the experience of a more intensive investigation of a specialized area. We provide this

within a flexible structure that recognizes the individual interests and varied backgrounds of our students.

### **Program Specific Admission Requirements**

To be competitive for admission, applicants must have strong backgrounds in mathematics. Generally, this means a bachelor's degree in mathematics or a closely related discipline. All applicants should have substantial coursework beyond the calculus sequence; courses in differential equations, linear algebra, and, in particular, courses in abstract algebra and analysis are highly recommended. A solid performance on the GRE Subject Test in Mathematics can demonstrate the applicant's mastery of these subjects. The GRE Subject Test in Mathematics is therefore recommended but is not required.

The GRE General Test is required, with a minimum Quantitative Reasoning score of 157 and Verbal score of 140. International applicants need a composite TOEFL score of 76 or an IELTS score of 6.5.

The TOEFL requirement may be waived if a student comes from an English speaking country or has earned a degree from an accredited institution with instruction in English within a year of applying. ETS only reports TOEFL scores taken within two years of the date of request.

### **Requirements for Admission for M.A.T. or M.S.T.**

Applicants are required to have:

- (a) A valid teaching endorsement in any state or educational requirements satisfied for secondary teaching;
- (b) courses equivalent to MATH 3205, 3500, 4000 and 4600;
- (c) a course in computer programming.

Students who enter the program with a deficiency in the courses listed in (b) must take them at UW, but these courses may not be counted toward the course requirements of the M.S.T./M.A.T. program.

### **Graduate Interdisciplinary Computational Science Minor**

In recognition of the importance of modeling and simulation in an increasing number of applications, the Graduate Interdisciplinary Computational Science Minor is intended to help prepare science, math, and engineering students for leading roles in their professions.

### **Requirements**

- The student must earn 15 credit hours in specified courses.
- Within the 15 credits, the student must earn at least 12 credits in graduate level classes (5000).
- Within the 15 credits, the student must earn 6 credits outside of her/his department.
- Only grades of B or better will be accepted for a course counting towards the minor.
- For all students, the 15 hours of coursework will be divided into 9 credit hours of core courses and 6 credit hours of electives.

### **Core Courses**

- Computational Methods in Applied Sciences I (MATH 5310/COSC 5310), 3 hrs.
- Introduction to High-Performance Computing (COSC 5010), 3 hrs.
- Computational Methods II (MATH 5340/COSC 5340), 3 hrs.
- Computational Biology (BOT 4550/5550), 4 hrs.
- Groundwater Flow and Transport Modeling (GEOL 4030/5030), 3 hrs.
- Computational Fluid Dynamics I (ME 5461), 3 hrs.
- Computational Fluid Dynamics II (ME 5462), 3 hrs.
- Computational Methods in Statistics (STAT 5660), 3 hrs.

### **Electives**

- Analysis of Algorithms (COSC 5110), 3 hrs.
- Advanced Bayesian Statistics (STAT 5680), 3 hrs.
- Bayesian Data Analysis (STAT 5380), 3 hrs.
- High-Performance Computing in Geosciences, 2 hrs.
- Mathematics Modeling of Processes (MATH 5320), 3 hrs.
- Molecular Modeling (CHEM 4560/5560), 3 hrs.
- Mathematical and Computational Methods in Physics (PHYS 4840), 3 hrs.
- Mathematical Modeling (MATH 4300), 3 hrs.



## Graduate Assistantships

The mathematics department employs approximately 25 graduate assistants each year. Assistantships include a full tuition and fee waiver, a monthly living stipend, and health insurance. Ph.D. students normally receive a higher stipend than master's students.

Teaching assistants teach an undergraduate course each semester.

Students may also compete for research assistantships, provided that their interests align with an externally funded research project.

Summer support is not guaranteed but is usually available through teaching and research opportunities.

Renewal of funding and continuation in the mathematics graduate program is dependent upon the student's adequate progress towards graduation.

## Program-Specific Degree

### Requirements

#### *Master's Programs: M.A. and M.S. Plan A and Plan B*

Students in the program must:

Maintain a 3.0 cumulative GPA.

Complete 30 hours of formal mathematics coursework at the 5000 level.

Within the 30 hours of 5000-level courses, complete the following courses with a grade of B or better: MATH 5200, 5230, 5310, 5400, 5500, and 5550.

Within the 30 hours of 5000-level courses, pass 1 hour of MATH 5800-01, Professional Development.

Within the 30 hours of 5000-level courses, the Plan A student must complete 4 hours of MATH 5960, Thesis Research. At least 26 hours of 5000-level coursework must be math-content courses (not thesis research).

The student must pass the foundation exam.

The student must prepare a master's thesis (Plan A) or a master's paper (Plan B) and give an oral defense.

#### *Master's Program: Second Option for Plan B Degree*

A second M.A. or M.S. option exists for the Plan B student. In lieu of writing a paper, the student takes a sequence of three 5000-level courses. The sequence must be approved by the student's adviser and the mathematics graduate committee. Two of the courses must be mathematics-department offerings, and

the third may be either a mathematics course (including reading/topics courses) or a course from another department in a related field.

A student graduating under this option must:

Maintain a 3.0 GPA.

Complete 36 hours of formal coursework at the 5000 level.

Within the 36 hours, complete with a grade of B or better: Math 5200, 5230, 5310, 5400, 5500, 5550.

Within the 36 hours, pass 1 hour of Math 5800-01, Professional Development.

Within the 36 hours, complete with a grade of A or B a 3-course sequence as approved by the student's advisor and the graduate committee.

Pass the foundation exam.

Write a short paper and give a presentation on the 3-course sequence.

In approving the student's proposal for this option, the graduate committee and the adviser will consider how the writing and independent study spirit of the Plan B option are fulfilled within the recommended plan.

#### *Master of Arts in Teaching or Master of Science in Teaching*

This degree is intended for in-service high school or middle school math teachers. The M.S.N.S. (Master of Science in Natural Science) Math option, through the Science and Math Teaching Center of the College of Education, is an alternative for middle school teachers.

Candidates for the M.S.T. or M.A.T. must take at least 30 hours of coursework at the 4000 level or above, of which at least 18 hours must be math courses, and at least 24 hours must be in the College of Arts and Sciences.

GPA of 3.0 in math courses is required.

EDRE 5530 or 5550 is recommended as part of the student's program.

The student prepares a master's thesis (Plan A) or master's paper (Plan B) and gives an oral defense.

Students must have two years' teaching experience at the precollege level, which may be completed during the degree program.

#### *Doctoral Program*

The student must maintain a 3.0 cumulative GPA.

The student must teach two semesters of college mathematics.

The student must complete a combination of 72 hours of coursework and dissertation research. Within the 72 hours, a maximum of 12 hours can be at the 4000 level, and 42 hours must be formal courses at the 5000 level. The courses must be mathematics courses or courses with significant mathematical content, as approved by the department's graduate committee.

Within the 42 hours of 5000-level courses, the student must:

Complete MATH 5200, 5230, 5310, 5400, 5500, and 5550 with a grade of B or better.

Take a broadening course as defined by the department and pass with a grade of B or better.

Take two hours of MATH 5800-02, Seminars and Colloquia.

Complete courses distributed in three areas: algebra, analysis, and applied mathematics. The student must take at least two courses in each of two categories and at least one course from the third category. The department maintains a list of course categories.

In addition, the student must:

Pass the foundation exam, the qualifying exam in the student's research area, and the preliminary exam.

Write a dissertation containing the student's original mathematical results and present an oral defense of the research.

## Mathematics (MATH)

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).**

**1000. Problem Solving. 3. [QA◀▶Q]** For students not planning to enroll in MATH 1400, 1450 or a calculus course. Examines modern topics chosen for their applicability and accessibility. Provides students with mathematical and logical skills needed to formulate, analyze and interpret quantitative arguments in a variety of settings. Introduces statistics and stresses the use of a calculator.

*Note:* MATH 1000 is neither a prerequisite nor suitable preparation for MATH 1400 (College Algebra). *Prerequisite:* grade of C or better in Math 0921 or Level 2 on the Math Placement Exam or Math ACT of 21 or Math SAT of 600.

**1050. Finite Mathematics. 3. [QB◀▶Q]** Introduces finite mathematics for majors not requiring calculus. Includes matrix algebra, Gaussian elimination, set theory, permuta-

tions, probability and expectation. *Prerequisite:* grade of C or better in MATH 1000, 1400 or 1105 or Level 4 on the Math Placement Exam or Math ACT of 26 or Math SAT of 600.

**1100. Number and Operations for Elementary School Teachers. 3. [QA♦(none)]** For prospective elementary school teachers; purpose is to prepare students to be competent in teaching the major concepts and skills related to the real number system and four arithmetic operations. Includes asking and answering critical questions about subsets of the real number system, including natural, integer, and rational numbers. *Prerequisite:* grade of C or better in MATH 0921 or Level 2 on the Math Placement Exam or Math ACT of 21 or Math SAT of 600.

**1105. Data, Probability, and Algebra for Elementary School Teachers. 3. [QB♦Q]** Continuation of MATH 1100 for prospective elementary teachers; emphasis is on asking and answering critical questions about our world through algebra, probability, and data analysis to prepare students to be competent in teaching these major concepts. Explorations focus on representing, analyzing, and generalizing patterns and the chances of future events. *Prerequisite:* grade of C or better in MATH 1100.

**1123. Math, Music and Acoustics. 3. [(none)♦Q]** For music majors and minors not planning to enroll in MATH 1400, 1450 or a calculus course. Serves as an introduction to the mathematics and physics underlying music and develops quantitative reasoning in a musical context. Topics include the wave nature of sound, intervals, scales, temperament, acoustics and psychoacoustics. Note: MATH 1123 is neither a prerequisite nor suitable preparation for MATH 1400. *Prerequisites:* grade of C or better in MATH 0921 or Level 2 on the Math Placement Exam or Math ACT of 21 or Math SAT of 600 and grade of C or better in MUSC 1030.

**1400. College Algebra. 3. [QA♦Q]** Emphasizes aspects of algebra important in the study of calculus. Includes notation of algebra, exponents, factoring, theory of equations, inequalities, functions, graphing and logarithms. For students who plan to enroll in a calculus course (MATH 2200 or 2350). Students receiving credit for MATH 1450 may not receive credit for this course. *Prerequisite:* grade of C or better in Math 0925 or Level 3 on the Math Placement Exam or Math ACT of 23 or Math SAT of 600.

**1405. Trigonometry. 3. [QA♦Q]** Emphasizes aspects of trigonometry important in the study of calculus. Interplay between trigonometric expressions and their graphs. Students are expected to use a graphing calculator in the course and on exams. See instructor for

specifications. Topics include: angle measurement, trigonometric functions, graphing, laws of sines and cosines, identities, equations, polar equations and graphs, vectors, complex numbers, DeMoivre's theorem. This course is designed for students with little or no prior knowledge of trigonometry who plan to enroll in MATH 2200. Students receiving credit for MATH 1450 may not receive credit for this course. *Prerequisite:* grade of C or better in MATH 1400 or Level 4 on the Math Placement Exam or Math ACT of 25 or Math SAT of 600.

**1450. Algebra and Trigonometry. 5. [QA♦(none)]** Emphasizes aspects of algebra, trigonometry and problem solving important in the study of calculus. Functions and their applications to real world problems. Classes of functions including polynomial, exponential, logarithmic and trigonometric functions. Intuitive introduction to the idea of limit and sequence which are developed further in the calculus sequence. For the student with considerable prior exposure to trigonometry and algebra. Graphing calculators are used frequently in class and on assignments. See instructor for specifications. Students with both MATH 1400 and 1405 credit may not receive credit for this course. *Prerequisite:* grade of C or better in MATH 0925 or Level 3 on the Math Placement Exam or Math ACT of 23 or Math SAT of 600.

**2120. Geometry and Measurement for Elementary School Teachers. 3.** Continuation of MATH 1105 for prospective elementary teachers; emphasis is on asking and answering critical questions about spatial reasoning as evident in the real world. Includes investigations of two- and three-dimensional shapes and their properties, measurements, constructions, and transformations to prepare students to be competent in teaching these concepts. *Prerequisite:* grade of C or better in MATH 1105.

**2200. Calculus I. 4. [QB♦Q]** Emphasizes physical science applications. Includes plane analytic geometry, differentiation, applications of the derivative, differential equations, integration and applications. *Prerequisite:* grade of C or better in MATH 1405 or 1450 or Level 5 on the Math Placement Exam or Math ACT of 27 or Math SAT of 600.

**2205. Calculus II. 4. [(none)♦Q]** Continues MATH 2200. Includes elementary functions, derivatives, integrals, analytical geometry, infinite series and applications. *Prerequisite:* grade of C or better in MATH 2200 or Advanced Placement credit in MATH 2200.

**2210. Calculus III. 4.** Continues MATH 2200, 2205. Includes vectors and solid analytic geometry, partial differentiation and multiple

integration. *Prerequisite:* grade of C or better in MATH 2205 or Advanced Placement credit in MATH 2205.

**2250. Elementary Linear Algebra. 3.** Studies linear equations and matrices, vector spaces, linear transformations, determinants, orthogonality, eigenvalues and eigenvectors. *Prerequisite:* grade of C or better in MATH 2200 or 2350.

**2300. Discrete Structures. 3.** Introduces the mathematical concepts that serve as foundations of computer science: logic, set theory, relations and functions, graphs (directed and undirected), inductively defined structures (lists and trees), and applications of mathematical induction. Provides an introduction to abstract and rigorous thinking in advanced mathematics and computer science. Cross listed with COSC 2300. *Prerequisite:* grade of C or better in COSC 1030, MATH 2200 or 2350.

**2310. Applied Differential Equations I. 3.** Combines with MATH 3310 for a one-year series in applied mathematics. Includes solution of ordinary differential equations, integral transforms. Emphasizes construction of mathematical models arising in physical science and other areas. *Prerequisite:* grade of C or better in MATH 2205. (*Note:* MATH 2210 is required for the sequel.)

**2350. Business Calculus. 4. [QB♦Q]** Combines with MATH 2355 for a one-year series in business math, primarily for students in the College of Business. Includes review of functions, their graphs and algebra; derivatives and their applications; exponential and logarithmic functions; integration and applications; and applications are generally geared to business problems. *Prerequisite:* grade of C or better in MATH 1400 or Level 4 on the Math Placement Exam or Math ACT of 26 or Math SAT of 600.

**2355. Mathematical Applications for Business. 4.** Continues business and economic applications of mathematics. Also includes linear equations and programming, finance, probability and statistics. Mandatory computer lab using spreadsheet software will meet one day per week. *Prerequisite:* grade of C or better in MATH 2200 or 2350.

**2800. Mathematics Major Seminar. 2.** Introduces mathematics majors and minors to mathematical investigation and discovery. Typically, a range of topics are covered; may include reading assignments and group or individual work on projects for presentation. Offered S/U only.

**2850 [3800]. Putnam Team Seminar. 2 (Max. 8).** Preparation for the William Lowell Putnam Mathematical Competition. Problem solving strategies and mathematical content appropriate for the Putnam Exam are empha-

sized with problem sets taken from previous Putnam or other international math contests. Offered S/U only. *Prerequisites:* MATH 2200, 2205. (Offered fall semester)

**3205. Analysis I: Elementary Real Analysis. 3.** An introduction to rigorous analysis in one real variable. Includes a rigorous reconsideration of the elements of calculus: the real number system, numerical sequences and series, limits, continuity, differentiability, and Riemann integrability for function of one variable. Proof and mathematical writing are emphasized. *Prerequisite:* Grade of C or better in MATH 2205 and 2800.

**3310. Applied Differential Equations II. 3.** Continues MATH 2310. Includes partial differential equations, Fourier series, boundary value problems, series solutions of ordinary differential equations, linear algebra, linear systems of equations and numerical methods. *Prerequisite:* grade of C or better in MATH 2210 and 2310.

**3340. Introduction to Scientific Computing. 3.** Introduces basic numerical methods to solve scientific and engineering problems. Topics include: code structure and algorithms, basic numerical methods for linear systems, eigenvalue problems, interpolation and data fitting, nonlinear systems, numerical differentiation and integration. Cross listed with COSC 3340. *Prerequisites:* grade of C or better in MATH 2210.

**3500. Algebra I: Introduction to Rings and Proofs. 3.** Begins with common features of integers, rational numbers, and polynomials, leading to study of rings in general. Topics include divisibility, factorization, and modular arithmetic for integers and polynomials, and homomorphisms and ideals for rings. Proof techniques include direct proof, proof by contraposition, mathematical induction, and proof by contradiction. *Prerequisites:* MATH 2800 and grade C or better in MATH 2250 or concurrent registration in MATH 2250.

**3700. Combinatorics. 3.** Provides an introduction to combinatorics and combinatorial algorithms, with applications to areas such as computer science and probability. Topics include general counting methods, recurrence relations, generating functions, inclusion-exclusion, partial orders, and graph theory. *Prerequisite:* grade of C or better in Math 2250. (Offered fall semester)

**4000. History of Mathematics. 3.** Explores the roots of mathematics and the people who made significant contributions to it. Mathematical subjects typically include algebra, calculus and number theory; both chrono-

logical and topical approaches are employed. *Prerequisite:* grade of C or better in MATH 2205. (Offered spring semester)

**4100. Mathematics in the Elementary School. 1-6 (Max. 6).** Acquaints prospective or experienced teachers of mathematics with newer developments in mathematics curriculum and materials. Emphasizes mathematical basis for courses in an elementary mathematics curriculum; organization and design of mathematics programs for grades K-7; and design and construction of curriculum and/or materials to meet specific needs of the teacher or school district. *Prerequisites:* grade of C or better in MATH 1105 and consent of instructor.

**4150. Secondary School on Campus. 1-4 (Max. 8).** Provides prospective teachers opportunity to study mathematics as it relates to the secondary school. Topics may vary from semester to semester. Emphasizes current trends and concerns of secondary school mathematics education. *Prerequisites:* grade of C or better in MATH 2205 and concurrent with EDSE 4271. (Offered fall semester)

**4200. Analysis 2: Advanced Analysis. 3.** A second course in analysis. Includes metric space topology, sequences and series of functions, and analysis in  $\mathbb{R}^n$ . *Prerequisites:* grade of C or better in MATH 2210, 2250 and 3205. (Offered fall semester)

**4205. Analysis 3: Undergraduate Topics in Analysis. 3.** Special topics in analysis. Content varies. May be repeated for credit. *Prerequisite:* grade of C or better in MATH 4200. (Offered spring semester)

**4230. Introduction to Complex Analysis. 3.** Develops the theory of functions of one complex variable. Topics include the algebra and geometry of complex numbers, functions of one complex variable, elementary functions, limits, continuity and differentiation. Differentiability leads to the Cauchy theorem, integral theorems, power series, residue theory and applications to integration theory and boundary value problems. *Prerequisite:* grade of C or better in MATH 2210. (Offered spring semester)

**4255 [4250]. Mathematical Theory of Probability. 3.** Calculus-based. Introduces mathematical properties of random variables. Includes discrete and continuous probability distributions, independence and conditional probability, mathematical expectation, multivariate distributions and properties of normal probability law. Cross listed with STAT 4255. *Prerequisite:* grade of C or better in MATH 2210.

**4265 [4260, 4010]. Introduction to the Theory of Statistics.** Presents derivations of theoretical and sampling distributions. Intro-

duces theory of estimation and hypothesis testing. Cross listed with STAT 4265. *Prerequisite:* MATH 4255.

**4300. Introduction to Mathematical Modeling. 3.** A model of a real world problem captures the essential features of the problem, while scaling it down to a manageable size. In this course, symbolic tools and mathematical techniques are used to construct, analyze and interpret various mathematical models which arise from problems in the physical, biological and social sciences. *Prerequisite:* grade of C or better in MATH 2250 or 3310. (Offered fall semester)

**4340. Numerical Methods for Ordinary and Partial Differential Equations. 3.** Further develops the skills needed for computational problem solving and numerical analysis. Topics addressed include: one-step and linear multistep methods for solving initial value problems; truncation errors, stability analysis, and convergence of the numerical methods; finite difference approximation for elliptic equations and initial boundary value problems; iterative methods for sparse linear systems. Students typically complete a final project in this course. Cross listed with COSC 4340. *Prerequisites:* grade of C or better in MATH 2310 and MATH 3340. (Offered spring semester)

**4400. Topics in Applied Math. 3.** Presents topics in applied mathematics that are of importance for a variety of disciplines in science and engineering. Content will vary and may include: mathematical biology, vector calculus, mathematics for finance, dimensional analysis and perturbation methods and the calculus of variations. *Prerequisites:* grade of C or better in MATH 2250 and MATH 2210. (Offered fall semester)

**4420. Advanced Logic. 3.** Studies advanced topics in mathematical logic. Takes up such topics as: uninterpreted calculi and the distinctive contributions of syntax and semantics; metatheory, including completeness and consistency proofs; modal logic and semantics; logic as a philosophical tool. Dual listed with MATH 5420; cross listed with COSC/PHIL 4420. *Prerequisite:* PHIL 3420 or equivalent.

**4440. Introduction to Partial Differential Equations I. 3.** Survey of analytic methods for solving partial differential equations. Topics include: method of characteristics for solving first-order linear and quasi-linear equations; classification of second-order equations and canonical forms; background to separation of variables with applications; transform methods and Green functions; elliptic equations; heat and wave equations in one dimension. *Prerequisites:* grade of C or better in MATH 2210 and MATH 2310. (Offered spring semester)

**4500. Matrix Theory. 3.** Continuation from MATH 2250 of the study of matrices, an important tool in statistics, physics, engineering and applied mathematics in general. Concentrates on the structure of matrices, including diagonalizability; symmetric, hermitian and unitary matrices; and canonical forms such as Jordan form. *Prerequisite:* grade of C or better in MATH 2250. (Offered fall semester)

**4510. Algebra II: Introduction to Group Theory. 3.** An introduction to the fundamental properties of groups including: binary operations, groups, permutation groups, subgroups, homomorphisms, and quotient groups. *Prerequisite:* grade of C or better in MATH 3500. (Offered spring semester)

**4520. Algebra III: Topics in Abstract Algebra. 3.** Further examples and structure of rings and fields. Finite fields and number fields. Special topics. *Prerequisite:* grade of C or better in MATH 4510. (Offered fall semester)

**4550. Theory of Numbers. 3.** Studies topics in mathematics which are motivated by questions about integers. Topics include divisibility, congruences, diophantine equations, quadratic residues, primitive roots, primes, and representations of positive integers. *Prerequisite:* grade of C or better in MATH 3500. (Offered spring semester)

**4600. Foundations of Geometry. 3.** Broadens the student's understanding of the many faces of geometry and provides a context for the specific case of Euclidean geometry. Various approaches will be presented, including axiomatic, synthetic, coordinate, and transformational methods. *Prerequisite:* grade of C or better in MATH 3205 or 3500. (Offered fall semester)

**4800. Seminar in Mathematics. 1-3 (Max. 6).** Exposes students to problems and thinking in mathematics which would otherwise be unavailable. *Prerequisite:* consent of instructor.

**4970. Professional Development in Teaching. 1.** Undergraduate student will assist in classroom and discussion section teaching under the guidance of an instructor in Mathematics. Does not count towards Mathematics degree requirements. Offered Satisfactory/Unsatisfactory only. *Prerequisite:* Consent of instructor.

**5090. Topics in the Foundations of Mathematics. 1-6 (Max. 9).** *Prerequisites:* MATH 3000 and consent of instructor.

**5100. Seminar in Elementary School Mathematics. 1-4 (Max. 8).** A course to give graduate students in mathematics education, or in-service teachers, an in-depth view of new contents, materials, and strategies for teaching mathematics in elementary schools. The course is primarily designed to meet the

needs of students working towards M.S.N.S., M.S.T., M.A.T. degrees. *Prerequisite:* 6 hours of MATH 4100.

**5110. Modeling Flow Transport in Soil and Groundwater Systems. 4.** Mathematical models are formulated and applied to simulate water flow and chemical transport in soil and groundwater systems. Soil spatial variability and heterogeneity are considered in the modeling processes. Using and comparing models, students obtain the capability to transfer a physical problem to a mathematical model, to use numerical methods, such as the finite element methods, to solve the mathematical problem, and to correctly interpret the numerical outputs. Students develop and program numerical solutions for select problems and utilize existing codes for modeling a variety of comprehensive problems. Cross listed with SOIL 5110.

**5140. Numbers, Operations, and Patterns for the Middle-level Learner. 3.** Provides working middle-level mathematics teachers opportunities to understand and discuss numbers, their representations, and operations on them from an abstract perspective that includes elegant proof. Also emphasized is the role of language and purpose in composing definitions. Cross listed with NASC 5140.

*Prerequisites:* admission to a university graduate program, in either degree or non-degree seeking status, and acceptance into the Middle-level Mathematics Program.

**5150. Seminar in Secondary School Mathematics. 1-4 (Max. 18).** Seminar in Secondary School Mathematics. *Prerequisite:* 6 hours of MATH 4150.

**5160. Social and Historical Issues in Mathematics and the Middle-Level Learner. 3.** Empowers teachers of middle-level mathematics to design more engaging experiences. Emphasizes the historical context for the development of mathematics, especially its symbols, tools, personalities, and classic problems. Cross listed with NASC 5160. *Prerequisites:* admission to a UW graduate program, in either degree or non-degree seeking status, and acceptance into the Middle-level Mathematics Program.

**5170. Connecting Geometry with Problem-Solving for the Middle-Level Learner. 3.** Showcases two aspects of 2D and 3D geometry: measurement and transformation. Emphasis reflects current state and national standards for middle-level mathematics classroom and teacher preparation, especially appropriate uses of technology, geometric tools, mathematical language, and problem-solving strategies. Cross listed with NASC 5170. *Prerequisites:* admission to a university graduate

program, in either degree or non-degree seeking status, and acceptance into the Middle-level Mathematics Program.

**5190. Mathematics of Change and the Middle-Level Learner. 3.** Students gain a solid understanding of data and functions in the service of calculus. Course is hands-on, project-driven and focuses on the essential concepts of functions and calculus and their role in middle-level mathematics. Emphasis is on writing and technology (calculators and probeware). Cross listed with NASC 5190. *Prerequisites:* admission to a UW graduate program, in either degree or non-degree seeking status, and acceptance into the Middle-level Mathematics Program.

**5200. Real Variables I. 3.** Develops the theory of measures, measurable functions, integration theory, density and convergence theorems, product measures, decomposition and differentiation of measures, and elements of function analysis on  $L_p$  spaces. Lebesgue theory is an important application of this development. *Prerequisite:* MATH 4200.

**5205. Real Variables II. 3.** A continuation of MATH 5200. *Prerequisite:* MATH 5200.

**5230. Complex Variables I. 3.** Develops the function theory of holomorphic (analytic) and harmonic functions. Topics covered include the Cauchy-Riemann equations, Cauchy-Goursat theorem, Cauchy integral theorem, Morera's theorem, maximum modulus theorem, Liouville's theorem, power series representation, harmonic functions, theory of singularities of functions of one complex variable, contour integration, analytic continuation, Riemann mapping theorem and topology of spaces of holomorphic functions. *Prerequisite:* MATH 4200.

**5235. Complex Variables II. 3.** A continuation of MATH 5230. *Prerequisites:* MATH 5230.

**5255. Mathematical Theory of Probability. 3.** Calculus-based. Introduces mathematical properties of random variables. Includes discrete and continuous probability distributions, independence, and conditional probability distributions, independence and conditional probability, mathematical expectation, multivariate distributions and properties of normal probability law. Dual listed with MATH 4255, cross listed with STAT 5255. *Prerequisites:* grade of C or better in MATH 2210 or 2355.

**5265. Introduction to the Theory of Statistics. 3.** Presents derivations of theoretical and sampling distributions. Introduces theory of estimation and hypothesis testing. Dual listed with MATH 4265, cross listed with STAT 5265. *Prerequisites:* STAT 4250/5250, MATH 4250.

**5270. Functional Analysis I. 3.** Topics include the geometry of Hilbert spaces, linear functions and operators on Hilbert spaces, spectral theory of compact normal operators, Banach space theory, the open mapping theorem, Hahn-Banach theorem, Banach-Steinhaus theorem, duality and linear operators on Banach spaces, and different topologies on Banach spaces and their duals. *Prerequisite:* MATH 5200.

**5275. Functional Analysis II. 3.** Topics may include discussion of topological vector spaces, locally convex spaces, F-spaces, spectral theory of non-compact operators on Hilbert spaces, semigroups or evolution operators, distribution theory, and applications to differential equations and Sobolev spaces. *Prerequisite:* MATH 5270.

**5290. Topics in Analysis. 1-6 (Max. 18).** Topics in analysis. *Prerequisite:* consent of the instructor.

**5310. Computational Methods in Applied Sciences I. 3.** First semester of a three-semester computational methods series. Review of iterative solutions of linear and nonlinear systems of equations, polynomial interpolation/approximation, numerical integration and differentiation, and basic ideas of Monte Carlo methods. Comparison of numerical techniques for programming time and space requirements, as well as convergence and stability. Identical to COSC 5310. *Prerequisite:* MATH 3310, COSC 1010.

**5320. Mathematical Modeling Processes. 3.** Introduction to techniques in the process of constructing mathematical models. Application of the techniques to areas such as petroleum reservoir simulation, chemical process industry operations, and plant start-up. Identical to CHE 5870. *Prerequisite:* MATH 5310 and graduate standing.

**5340. Computational Methods II. 3.** Second semester of a three-semester computational methods series with emphasis on numerical solution of differential equations. Topics include explicit and implicit methods, methods for stiff ODE problems, finite difference, finite volume, and finite element methods for time-independence PDEs semi/fully discrete methods for time-dependent PDEs. Cross listed with COSC 5340. *Prerequisite:* MATH 5310.

**5345. Computational Methods III. 3.** Third semester of a three-semester computational methods series with emphasis on numerical solution of problems displaying sharp fronts and interfaces (nonlinear conservation laws, Hamilton-Jacobi equations). Cross listed with COSC 5345. *Prerequisite:* MATH 5340.

**5390. Topics in Numerical Analysis. 1-6. (Max 18).** Topics in numerical analysis. *Prerequisite:* consent of the instructor.

**5400. Methods of Applied Mathematics I. 3.** First semester of a one-year survey of topics and methods of applied mathematics, with emphasis on applications from physics and engineering. The full sequence includes introductions to mathematical aspects of mechanics (e.g., conservation laws), asymptotic expansions, systems of ODE and stability, integral equations and calculus of variations, PDE with boundary value problems and generalized solutions (including wave, heat, and potential equations), numerical methods and stability. *Prerequisite:* MATH 2250, 4200 or 4400, and 2310 or 4430.

**5405. Methods of Applied Mathematics II. 3.** A continuation of MATH 5400. *Prerequisite:* MATH 5400.

**5420. Advanced Logic. 3.** Studies advanced topics in mathematical logic. Takes up such topics as: uninterpreted calculi and the distinctive contributions of syntax and semantics; metatheory, including completeness and consistency proofs; modal logic and semantics; logic as a philosophical tool. Dual listed with MATH 4420; cross listed with COSC/PHIL 5420. *Prerequisite:* PHIL 3420 or equivalent; graduate standing.

**5430. Ordinary Differential Equations II. 3.** Differential equations constitute the mathematical language for problems of continuous change. ODEs deal with evolutionary processes involving one independent variable. This course revisits solution techniques but emphasizes the theoretical framework. Topics include: existence and uniqueness, linear and nonlinear differential systems, asymptotics and perturbations, and stability. *Prerequisite:* MATH 4200, 4430.

**5440. Partial Differential Equations II. 3.** The theory of PDEs is important for abstract mathematics, applied science, and mathematical modeling. This course covers solution techniques but emphasizes the theoretical framework. Topics include: first order systems; characteristics; hyperbolic, elliptic and parabolic equations; separations of variables; series and transforms; integral relations; Green's functions, maximum principles; variational methods. *Prerequisite:* MATH 4200 and 4440.

**5490. Topics in Applied Mathematics. 1-6 (Max. 18).** *Prerequisite:* consent of instructor.

**5500. Advanced Linear Algebra. 3.** An introduction to the theory of abstract vector spaces and linear transformations from an axiomatic point of view, with applications to matrix theory. Topics include vector spaces,

dimension, linear transformations, dual spaces and functionals, inner product spaces, and structure theorems. *Prerequisite:* MATH 3500 and MATH 4500.

**5510. Combinatorial Theory. 3.** An introduction to combinatorics covering both classical and contemporary topics. Includes some of the following: generating functions, recursion formulas, partially ordered sets, inclusion-exclusion, partitions, graph theory, Ramsey theory, combinatorial optimization, Latin squares, finite geometries, and design theory. *Prerequisite:* consent of the instructor.

**5530. The Theory of Groups. 3.** An in-depth study of various aspects of group theory, building on MATH 5550. Topics include some of the following: classical theory of finite groups (both Abelian and non-Abelian), infinite Abelian groups, free groups, permutation groups, group representations, endomorphism, extensions, and cohomology. *Prerequisite:* MATH 5550.

**5550. Abstract Algebra I. 3.** Studies the structure of groups, rings, and fields. For each, concepts of substructures, quotient structures, extensions, homomorphism, and isomorphism are discussed. *Prerequisite:* MATH 3500 or 5500.

**5555. Abstract Algebra II. 3.** A continuation of MATH 5550, examining in depth selected topics from the theory of rings, fields, and algebras, including Galois theory. *Prerequisite:* MATH 5550.

**5570. Matrix Theory and Combinatorics. 3.** An overview of matrix theory and its applications to combinatorics. Topics include Smith normal form, the Perron-Frobenius theory of non-negative matrices, location and perturbation of eigenvalues, and interlacing of eigenvalues. Applications include structure theorems for  $(0,1)$ -matrices, network flows, spectra of graphs, and the permanent. *Prerequisite:* MATH 5500.

**5590. Topics in Algebra. 1-6 (Max. 18).** Topics in algebra. *Prerequisites:* consent of the instructor.

**5600. Point-Set Topology. 3.** Topics considered are metric spaces, open spheres, open sets, closed sets, continuous functions, limit points, topological spaces, homeomorphisms, compactness, connectedness, and separability. The familiar notion of distance on the real number line is generalized to the notion of a metric for an arbitrary set, which is in turn generalized to the concept of a set topology for a set. Certain applications to analysis and geometry are indicated. *Prerequisite:* MATH 3205.

**5605. Algebraic Topology. 3.** Topics in algebraic topology, including simplicial homology groups and their topological invariance, the

Eilenberg-Steenrod axioms, singular homology theory, and cohomology. *Prerequisite:* MATH 3500.

**5640. Differential Geometry. 3.** Curve theory, theory of surfaces, and geometrics on a surface. *Prerequisite:* MATH 4200.

**5690. Topics in Topology. 1-6 (Max. 9).** *Prerequisite:* consent of instructor.

**5700. Topics in Combinatorics. 1-6 (Max. 18).** Selected topics in combinatorial analysis.

**5800. Seminar in Mathematics. 1-3 (Max. 8).** *Prerequisite:* consent of instructor.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate Program of Study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Graduate level course designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Microbiology Program

**Program Director:** Gerard P. Andrews

**Phone:** (307) 766-3139

**FAX:** (307) 766-3875

**E-mail:** gandrews@uwyo.edu

The Bachelor of Science degree program in microbiology is organized as an interdepartmental major involving the collaborative teaching, advising and research expertise of more than 20 microbiology faculty from the Colleges of Arts and Sciences, Agriculture and Health Sciences. The program is administered by a program director and a coordinating committee which represents each of the

participating colleges. Students may obtain their degree in the College of Agriculture and Natural Resources. Please see the College of Agriculture and Natural Resources Microbiology Program section for a list of faculty and program information.

## Music

**258 Buchanan Center for the**

**Performing Arts, 766-5242**

**FAX: (307) 766-5326**

**Web site:** www.uwyo.edu/music

**Department Head:** Theresa Bogard

### Professors:

**STEVE BARNHART**, B.M.E. Texas Tech University 1973; M.M. North Texas State University 1980; D.M.A. University of Kansas 1989; Professor of Music 2002, 1990. Percussion.

**ROBERT BELSER**, B.M.E. Central Missouri State University 1977; M.S. M.E. University of Illinois 1982; D.M.A. University of Iowa 1994; Professor of Music 2008, 1995. Director of Bands, Conducting, Music Education.

**THERESA L. BOGARD**, B.M. University of Colorado 1983; M.M. Eastman School of Music 1985; D.M.A. University of Colorado 1990; Professor of Music 2004, 1992. Keyboard, Keyboard Area Coordinator, Piano.

**JOHN FADIAL**, B.M. North Carolina School of the Arts 1987; M.M. Eastman School of Music 1989; D.M.A. University of Maryland 1995; Professor of Music 2015, 2008. Violin.

**MICHAEL GRIFFITH**, B.M.E. Michigan State University 1973; M.M. 1975; D.M.A. University of Colorado 1994; Professor of Music 2001, 1989. Conducting, Woodwinds.

**LARRY L. HENSEL**, B.A. Macalester College 1981; M.M. 1984; D.M.A. in Performance and Literature, Eastman School of Music 1993; Professor of Music 2007, 1996. Vocal Arts Area Coordinator, Voice, Opera Theatre, Vocal Literature.

**JAMES PRZYGOCKI**, B.M. Western Michigan University 1979; M.M. Indiana University 1984; Professor of Music 2005, 1993. Viola, String Methods, Music Education.

**J. SCOTT TURPEN**, B.M.E. Boise State University 1994; M.M. University of Georgia 1996; D.M.A. 1999; Professor of Music 2012, 2001. Director of Jazz Studies, Saxophone.

**KATRINA ZOOK**, B.M. Oberlin College 1986; M.M. University of California—Santa Barbara 1992; D.M.A. Eastman School of Music 2000; Professor of Music 2011, 1999. Voice, Music Appreciation, Vocal Methods, Vocal Pedagogy.

### Associate Professors:

**NICOLE LAMARTINE**, B.M. New Mexico State 1998; M.M. 2000, D.M.A. University of Arizona 2003; Associate Professor of Music 2013, 2008. Director of Choirs.

**ANNE GUZZO**, B.M. University of New Mexico 1992; M.A. University of California, Santa Cruz 1996; Ph.D. University of California, Davis 2002; Associate Professor of Music 2011, 2006. Composition, Theory.

**BETH VANDERBORGH**, B.M. Manhattan School of Music 1988; M.M. Eastman School of Music 1990; D.M.A. University of Maryland 1995; Associate Professor of Music 2014, 2008. Cello.

### Assistant Professors:

**HOLLY DALRYMPLE**, BM, Texas State University; MM, University of Texas-Austin; DMA, University of North Texas; Assistant Professor of Music 2013. Choral Education.

**BLAKE MCGEE**, B.M. University of Minnesota 2001; M.M. 2004, D.M.A. University of Oregon 2008; Assistant Professor of Music 2010. Clarinet, Musicology.

**SCOTT MEREDITH**, B.M., B.M.E. University of Northern Colorado 1996; M.M. 2003, D.M.A. University of North Texas 2008; Assistant Professor of Music 2009. Trumpet.

**CRYSTAL SIEGER**, B.M. Ohio State University 1992; M.M. University of Arizona 1994; Ph.D. 2012; Assistant Professor of Music 2014. Music Education.

**CHI-CHEN WU**, B.F.A. National Taiwan Normal University 1998; M.M. 2202; D.M.A. New England Conservatory 2006; Assistant Professor of Music 2012. Piano and Collaborative Piano.

### Lecturers:

Boddicker, Markley, Sinift, J. Turpen, Williamson

### Part-time Lecturers:

Allen, Berlinsky, Bird, Boddicker, Bretones, Fourt, Hart, Harvey, Hoffman, Johnston, Latchinsky, Reynolds, Riner, Soueidi, Strampe, Uno, Will

### Professors Emeriti:

David Brinkman, Gordon Childs, Julia Combs, Rodney Garnett, Frederick Gersten, Brian Hanly, Edgar Lewis, William Stacy, Carlyle Weiss

The Department of Music offers undergraduate and graduate degree programs which combine scholarship with performance, theory with practice and the academic with the creative. It also provides an opportunity for the study and performance of music by university students who are not majors in

music. By giving concerts, workshops and lectures throughout the state of Wyoming through the Fine Arts Outreach Program, the music department serves as a musical resource for the entire state. The music department is fully accredited by the National Association of Schools of Music.

Procedures and requirements are listed in the music department *Student Handbook* which is available online at [www.uwyo.edu/music/forms/index.html](http://www.uwyo.edu/music/forms/index.html). The music department *Student Handbook* and the *University Catalog* are binding documents for the degree programs listed below. Students must receive a “C” or better in all courses designated MUSC to satisfy department requirements. The foreign language requirement for the Bachelor of Arts in Music and the Bachelor of Music in Performance: Vocal Emphasis degrees may be satisfied with a “C” or better in all courses. A student’s transfer courses must meet all of these requirements to be accepted for credit.

An audition is required to become a Music major or minor. The 3 Steps to Becoming a Music Major are:

1. Apply for admission to the University of Wyoming (<http://www.uwyo.edu/admissions/>).
2. Audition for admittance as a Music major and for Music scholarships. Audition and scholarship information may be found at [www.uwyo.edu/music](http://www.uwyo.edu/music). All Music majors and minors MUST audition to be admitted to the Music program.
3. Perform at an acceptable level, and you are in!

## Degrees

### Bachelor of Arts (with major in music):

A program designed for the student who desires a broadly-based liberal arts program.

**Bachelor of Music Performance:** A four-year course of study designed for students who wish to prepare for a professional career as performer and applied teacher.

**Bachelor of Music Education:** A four-year course of study for the student who wishes to prepare for a career as a teacher of music in elementary or secondary schools in the instrumental, vocal, and general music fields.

## Performer’s (post-baccalaureate) Certificate

A non-degree course of study for the student seeking to improve professional performance skills. The program consists of a total of 30 credit hours from applied lessons, ensembles and electives to be selected in consultation with the major adviser. Prerequisites are demonstrated evidence of advanced performance proficiency through a live or recorded audition, undergraduate degree in music, and admission to the university.

## Music for Other Students

**Music as an elective subject.** Students from other departments of the university may, with consent of their adviser and applied instructor, elect private or class lessons in applied music (with or without previous training) and may enroll in any theory, music literature or activity course for which they are qualified. See the music department *Student Handbook* for requirements for a minor in music.

**Organizations.** Performance organizations include the Happy Jacks, Marching Band, Symphonic Band, Wind Ensemble, Collegiate Chorale, Symphony Orchestra, Chamber Orchestra, Singing Statesmen, Bel Canto, Women’s Choir, and Opera Theatre. Other groups are brass, woodwind, string, percussion and piano ensembles, Vocal Jazz, Civic Chorus and Jazz Ensemble. Membership is open to qualified students in all colleges and departments of the university. Each year, in addition to frequent appearances on the campus, several of these organizations and groups are heard on tour in Wyoming and neighboring states.

## Music Fees

### For Individual Instruction:

One 1/2-hour lesson weekly,  
per semester .....\$150.00  
One 1-hour lesson weekly,  
per semester ..... \$300.00

For Music 4510, 4520, 4530, 4540, 4550 and 4560 (courses taken in the form of private lessons) a fee of \$85.00 is assessed each semester.

### Practice Rooms:

per semester .....\$35.00  
Music instrumental fee, per semester...\$25.00  
Music locker fee, per student  
per semester .....\$15.00  
Public School Methods fee, per class....\$5.00

## Undergraduate Study

### Bachelor of Arts in Music

All music majors must successfully complete MUSC 0200 Convocation (0 credit, S/U) each semester in residence and must enroll in lessons and one major ensemble per semester. Each ensemble course is deemed to be a unique course even though the course number is not unique. To fulfill this degree requirement students will be expected to enroll in ensembles at the lower and upper divisions a minimum of four times with a career maximum of 8. All music majors must pass the piano proficiency test during their sophomore year. Class Piano I-IV is highly recommended for majors with little piano background. Consult your advisor for specific information.

### Learning Outcomes

Graduates of the UW Department of Music will develop the skills, concepts, and sensitivities essential to the professional life of a musician (NASM Handbook, p. 85).

At the completion of the Bachelor of Arts degree in Music, students will be able to: (1) demonstrate a level of competence as solo and ensemble performers appropriate for a musician educated in the liberal arts, (2) demonstrate specific knowledge in music theory, music history, and general studies appropriate for their professional goals, and (3) demonstrate the ability to think, speak, and write clearly and effectively about the art of music.

### Music Core

MUSC	0200 Convocation .....	0
MUSC	1003 Introduction to Music.....	3
MUSC	1030 Written Theory I.....	3
MUSC	1035 Aural Theory I.....	1
MUSC	1040 Written Theory II.....	3
MUSC	1045 Aural Theory II.....	1
MUSC	2030 Written Theory III .....	3
MUSC	2035 Aural Theory III.....	1
MUSC	2040 Written Theory IV .....	3
MUSC	2045 Aural Theory IV .....	1
MUSC	2050 Historical Survey I .....	3
MUSC	2055 Historical Survey II.....	3
MUSC	2395 Piano Proficiency.....	0
MUSC	3255 Sophomore Perf. Jury.....	0
MUSC	4070 Conducting .....	3
MUSC	**** Ensembles.....	8
MUSC	2*** Applied Lessons II.....	2
MUSC	3*** Applied Lessons III.....	2
MUSC	4*** Applied Lessons IV .....	2
MUSC	5*** Applied Lessons V .....	2

**Music Electives (13 Hrs.)**

MUSC	4010 Counterpoint .....	3
MUSC	4030 Form and Analysis.....	3
MUSC	4300 Instrumentation and Arr....	3
MUSC	4040 Composition.....	2
MUSC	4590 Senior Recital.....	2
MUSC	4320 Medieval Period .....	3
MUSC	4325 Renaissance Period.....	3
MUSC	4330 Baroque Period.....	3
MUSC	4335 Classic Period .....	3
MUSC	4340 Romantic Period .....	3
MUSC	4345 Contemporary Period.....	3
MUSC	4350 Hist and Lit of Jazz.....	3
MUSC	4400 Vocal Literature .....	2
MUSC	5410 Hist of Musical Instrum.....	2

**Foreign Language (8 Hrs.)**

**General Electives (19 Hrs.)**

**University and College Requirements**

In addition to the major requirements listed above, students must complete all university and College of Arts and Sciences requirements listed elsewhere in this *Catalog*. A minimum of 42 hours of the total degree must be at the junior/senior level. Check with your adviser about music courses which fulfill University Studies Program requirements.

**Bachelor of Music in Performance: Instrumental Emphasis**

All music majors must successfully complete MUSC 0200 Convocation (0 credit, S/U) each semester in residence and must enroll in lessons and one major ensemble per semester. Each ensemble course is deemed to be a unique course even though the course number is not unique. To fulfill this degree requirement students will be expected to enroll in ensembles at the lower and upper divisions a minimum of four times with a career maximum of 8. All music majors must pass the piano proficiency test during their sophomore year. Class Piano I-IV is highly recommended for majors with little piano background. Consult your advisor for specific information.

**Learning Outcomes**

Graduates of the UW Department of Music will develop the skills, concepts, and sensitivities essential to the professional life of a musician (NASM Handbook, p. 85).

At the completion of the Bachelor of Music degree in Instrumental Performance, students will be able to: (1) demonstrate excellence as solo and ensemble performers to provide a basis for a professional career as a musician, (2) demonstrate specific knowledge in music

theory, music history, and instrumental pedagogy to provide a basis for a professional career as a performing musician, and (3) demonstrate the ability to think, speak, and write clearly and effectively about the art of music.

**Music Core**

MUSC	0200 Convocation .....	0
MUSC	1003 Introduction to Music.....	3
MUSC	1030 Written Theory I.....	3
MUSC	1035 Aural Theory I.....	1
MUSC	1040 Written Theory II .....	3
MUSC	1045 Aural Theory II.....	1
MUSC	2030 Written Theory III .....	3
MUSC	2035 Aural Theory III .....	1
MUSC	2040 Written Theory IV .....	3
MUSC	2045 Aural Theory IV .....	1
MUSC	2050 Historical Survey I.....	3
MUSC	2055 Historical Survey II.....	3
MUSC	2395 Piano Proficiency .....	0
MUSC	3255 Sophomore Perf. Jury.....	0
MUSC	3500 Junior Recital.....	0
MUSC	4010 Counterpoint .....	3
MUSC	4030 Form and Analysis.....	3
MUSC	4070 Conducting .....	3
MUSC	4300 Instrumentation and Arr....	3
MUSC	4040 Composition.....	2
MUSC	4590 Senior Recital.....	2
MUSC	**** Ensembles.....	8
MUSC	2*** Applied Lessons II.....	4
MUSC	3*** Applied Lessons III.....	4
MUSC	4*** Applied Lessons IV .....	4
MUSC	5*** Applied Lessons V .....	4

**Instrumental Emphasis**

MUSC	4615 Specific Pedagogy .....	2
MUSC	4651 String Solo Literature (string students only).....	2

**Music Electives (9 Hrs.)**

MUSC	4320 Medieval Period .....	3
MUSC	4325 Renaissance Period .....	3
MUSC	4330 Baroque Period.....	3
MUSC	4335 Classic Period.....	3
MUSC	4340 Romantic Period .....	3
MUSC	4345 Contemporary Period.....	3
MUSC	4350 Hist and Lit of Jazz.....	3
MUSC	5410 Hist of Musical Instrum.....	2

**University and College Requirements**

In addition to the major requirements listed above, students must complete all university and College of Arts and Sciences requirements listed elsewhere in this *Catalog*. A minimum of 42 hours of the total degree must be at the junior/senior level. Check with your adviser about music courses which fulfill University Studies Program requirements.

**Bachelor of Music in Performance: Keyboard Emphasis**

All music majors must successfully complete MUSC 0200 Convocation (0 credit, S/U) each semester in residence and must enroll in lessons and one major ensemble per semester. Each ensemble course is deemed to be a unique course even though the course number is not unique. To fulfill this degree requirement students will be expected to enroll in ensembles at the lower and upper divisions a minimum of four times with a career maximum of 8. All music majors must pass the piano proficiency test during their sophomore year.

**Learning Outcomes**

Graduates of the UW Department of Music will develop the skills, concepts, and sensitivities essential to the professional life of a musician (NASM Handbook, p. 85).

At the completion of the Bachelor of Music degree in Keyboard Performance, students will be able to: (1) demonstrate excellence as solo and ensemble performers to provide a basis for a professional career as a musician, (2) demonstrate specific knowledge in music theory, music history, and piano pedagogy to provide a basis for a professional career as a performing musician, and (3) demonstrate the ability to think, speak, and write clearly and effectively about the art of music.

**Music Core**

MUSC	0200 Convocation .....	0
MUSC	1003 Introduction to Music.....	3
MUSC	1030 Written Theory I.....	3
MUSC	1035 Aural Theory I.....	1
MUSC	1040 Written Theory II .....	3
MUSC	1045 Aural Theory II.....	1
MUSC	2030 Written Theory III .....	3
MUSC	2035 Aural Theory III .....	1
MUSC	2040 Written Theory IV .....	3
MUSC	2045 Aural Theory IV .....	1
MUSC	2050 Historical Survey I.....	3
MUSC	2055 Historical Survey II.....	3
MUSC	2395 Piano Proficiency .....	0
MUSC	3255 Sophomore Perf. Jury.....	0
MUSC	3500 Junior Recital.....	0
MUSC	4010 Counterpoint .....	3
MUSC	4030 Form and Analysis.....	3
MUSC	4070 Conducting .....	3
MUSC	4300 Instrumentation and Arr....	3
MUSC	4590 Senior Recital.....	2
MUSC	**** Ensembles/Accompan.....	8
MUSC	2200 Applied Lessons II.....	4
MUSC	3200 Applied Lessons III .....	4
MUSC	4200 Applied Lessons IV.....	4
MUSC	5200 Applied Lessons V .....	4



**Keyboard Emphasis**

MUSC	4600 Piano Pedagogy.....	2
MUSC	4650 Keyboard Literature.....	3

**Music Electives (9 Hrs.)**

MUSC	4320 Medieval Period .....	3
MUSC	4325 Renaissance Period .....	3
MUSC	4330 Baroque Period.....	3
MUSC	4335 Classic Period.....	3
MUSC	4340 Romantic Period .....	3
MUSC	4345 Contemporary Period.....	3
MUSC	4350 Hist and Lit of Jazz I.....	3
MUSC	5410 Hist of Musical Instrum.....	2

**University and College Requirements**

In addition to the major requirements listed above, students must complete all university and College of Arts and Sciences requirements listed elsewhere in this *Catalog*. A minimum of 42 hours of the total degree must be at the junior/senior level. Check with your adviser about music courses which fulfill University Studies Program requirements.

**Bachelor of Music in Performance: Vocal Emphasis**

All music majors must successfully complete MUSC 0200 Convocation (0 credit, S/U) each semester in residence and must enroll in lessons and one major ensemble per semester. Each ensemble course is deemed to be a unique course even though the course number is not unique. To fulfill this degree requirement students will be expected to enroll in ensembles at the lower and upper divisions a minimum of four times with a career maximum of 8. All music majors must pass the piano proficiency test during their sophomore year. Class Piano I-IV is highly recommended for majors with little piano background. Vocal majors must complete 8 hours of a single, traditional foreign language. Consult your advisor for specific information.

**Learning Outcomes**

Graduates of the UW Department of Music will develop the skills, concepts, and sensitivities essential to the professional life of a musician (NASM Handbook, p. 85).

At the completion of the Bachelor of Music degree in Vocal Performance, students will be able to: (1) demonstrate excellence as solo and ensemble performers to provide a basis for a professional career as a musician, (2) demonstrate specific knowledge in music theory, music history, and vocal pedagogy to provide a basis for a professional career as a performing musician, and (3) demonstrate the ability to think, speak, and write clearly and effectively about the art of music.

**Music Core**

MUSC	0200 Convocation .....	0
MUSC	1003 Introduction to Music.....	3
MUSC	1030 Written Theory I.....	3
MUSC	1035 Aural Theory I.....	1
MUSC	1040 Written Theory II.....	3
MUSC	1045 Aural Theory II.....	1
MUSC	2030 Written Theory III.....	3
MUSC	2035 Aural Theory III.....	1
MUSC	2040 Written Theory IV .....	3
MUSC	2045 Aural Theory IV .....	1
MUSC	2050 Historical Survey I.....	3
MUSC	2055 Historical Survey II.....	3
MUSC	4010 Counterpoint .....	3
MUSC	4030 Form and Analysis.....	3
MUSC	4070 Conducting .....	3
MUSC	4300 Instrumentation and Arr....	3
MUSC	4590 Senior Recital.....	2
MUSC	**** Ensembles.....	8
MUSC	2770 Voice II.....	4
MUSC	3270 Voice III.....	4
MUSC	4270 Voice IV.....	4
MUSC	5270 Voice V.....	4
	Piano Proficiency.....	0

**Vocal Emphasis**

MUSC	2320 Diction for Singers I.....	2
MUSC	2325 Diction for Singers II.....	2
MUSC	4400 Vocal Literature .....	2
MUSC	4610 Vocal Pedagogy .....	2
	Foreign Language.....	8

**Music Electives (9 Hrs.)**

MUSC	4320 Medieval Period .....	3
MUSC	4325 Renaissance Period .....	3
MUSC	4330 Baroque Period.....	3
MUSC	4335 Classic Period.....	3
MUSC	4340 Romantic Period .....	3
MUSC	4345 Contemporary Period.....	3
MUSC	4350 Hist and Lit of Jazz.....	3
MUSC	5410 Hist of Musical Instrum.....	2

**University and College Requirements**

In addition to the major requirements listed above, students must complete all university and College of Arts and Sciences requirements listed elsewhere in this *Catalog*. Vocal majors must complete 8 hours of a single, traditional foreign language. A minimum of 42 hours of the total degree must be at the junior/senior level. Check with your adviser about music courses which fulfill University Studies Program requirements.

**Bachelor of Music Education**

All music majors must successfully complete MUSC 0200 Convocation (0 credit, S/U) each semester in residence and must enroll in lessons and one major ensemble per semester. Each ensemble course is deemed to be a unique course even though the course number is not

unique. To fulfill this degree requirement students will be expected to enroll in ensembles at the lower and upper divisions a minimum of four times with a career maximum of 8. All music majors must pass the piano proficiency test during their sophomore year. Class Piano I-IV is highly recommended for majors with little piano background. Consult your advisor for specific information.

**Learning Outcomes**

Graduates of the UW Department of Music will develop the skills, concepts, and sensitivities essential to the professional life of a musician (NASM Handbook, p. 85).

At the completion of the Bachelor of Music Education degree, students will be able to: (1) demonstrate skill as solo and ensemble performers who can work as professional educators, (2) demonstrate specific knowledge in music theory, music history, and instrumental and vocal pedagogy to provide a basis for a professional career as a music educator, (3) demonstrate the ability to think, speak, and write clearly and effectively about the art of music, and (4) demonstrate the pedagogical background and teaching experience to function as effective K-12 music educators.

**Music Core**

MUSC	0200 Convocation .....	0
MUSC	1003 Introduction to Music.....	3
MUSC	1025 Introduction to MusEd.....	2
MUSC	1030 Written Theory I.....	3
MUSC	1035 Aural Theory I.....	1
MUSC	1040 Written Theory II.....	3
MUSC	1045 Aural Theory II.....	1
MUSC	2030 Written Theory III.....	3
MUSC	2035 Aural Theory III.....	1
MUSC	2040 Written Theory IV .....	3
MUSC	2045 Aural Theory IV .....	1
MUSC	2050 Historical Survey I.....	3
MUSC	2055 Historical Survey II.....	3
MUSC	1310 PSM:Brass I.....	1
MUSC	1315 PSM:Brass II .....	1
MUSC	1320 PSM:Percussion I.....	1
MUSC	1325 PSM:Percussion II .....	1
MUSC	1330 PSM:Strings I .....	1
MUSC	1335 PSM:Strings II.....	1
MUSC	1340 PSM:Voice .....	1
MUSC	1345 PSM:Voice II.....	1
MUSC	1350 PSM:WWinds I.....	1
MUSC	1355 PSM:WWinds II.....	1
MUSC	1360 PSM:Guitar.....	1
MUSC	2395 Piano Proficiency.....	0
MUSC	3255 Sophomore Perf. Jury.....	0
MUSC	4070 Conducting .....	3
MUSC	4155 Senior Music Ed. Recital.....	0
MUSC	4300 Instrumentation and Arr....	3
MUSC	4620 MusEd Practicum.....	1

MUSC 2\*\*\* Applied Lessons II.....2  
 MUSC 3\*\*\* Applied Lessons III.....2  
 MUSC 4\*\*\* Applied Lessons IV .....2  
 MUSC 5\*\*\* Applied Lessons V .....2  
 Ensembles .....7

**Brass, Woodwind and Percussion**

**Emphasis**

MUSC 4380 Jazz Techniques.....2  
 MUSC 4750 Marching Techniques.....1  
 MUSC 4780 Instr Conducting.....2

**Vocal/General Emphasis**

MUSC 2320 Diction for Singers .....2  
 MUSC 4790 Choral Conducting .....2

**String Emphasis**

MUSC \*\*\*\* Secondary String Inst .....2  
 MUSC 4780 Instr Conducting.....2

**Professional Education Requirements**

EDST 2450 Foundations of  
 Development & Learning.....3  
 EDEX 2484 Intro. to Special Ed.....3  
 MUSC 4255 Elementary and Secondary  
 Methods: Practicum .....2  
 MUSC 4265 Elementary and Secondary .  
 Music Teaching Methods .....8  
 MUSC 4700 Residency in  
 Teaching/Elementary.....8  
 MUSC 4710 Residency in  
 Teaching/Secondary .....8

**University and College Requirements**

In addition to the major requirements listed above, students must complete all university requirements listed elsewhere in this *Catalog*. A minimum of 42 hours of the total degree must be at the junior/senior level. Check with your adviser about music courses which fulfill University Studies Program requirements.

**Graduate Study**

The Department of Music offers programs leading to the Master of Music in Performance and to the Master of Music Education.

The following prerequisites and credit hours will pertain to individual lessons for all the instruments and voice listed below. All students enrolled in MUSC 5080 through MUSC 5670 levels will be required to take a jury examination at the end of the semester to determine, in part, the final grade. (See current fee schedule for listing of fees in Individual Lessons.)

**Program Specific Admission Requirements**

In addition to the minimum requirements set forth in this *Catalog*, the Department of Music requires that applicants for graduate programs submit supplementary documentation of their preparation for advanced study in music.

**Master of Music Education**

An earned, documented Bachelor of Music Education degree from an accredited institution of higher learning.

One year of teaching experience plus:  
 An active background in music education,  
 A DVD of classroom teaching and/or rehearsing,  
 A one- to three-page statement of music education philosophy,  
 Three letters of recommendation, one from an immediate supervisor, of teaching effectiveness.

**Learning Outcomes**

1. Students will demonstrate the advanced musical and pedagogical knowledge and research/writing skills necessary to enhance their teaching abilities in a P-16 vocal and/or instrumental teaching position.
2. Students will demonstrate the advanced musical and pedagogical knowledge and research/writing/and communication skills necessary to solve contemporary music problems.

**Master of Music in Performance**

An earned, documented bachelor of music performance from an accredited institution of higher learning.  
 Live audition or a performance CD or DVD demonstrating:  
 A strong sense of musicality,  
 Technical proficiency,  
 Stylistically correct performance practices in at least three historical periods, where applicable,  
 A working knowledge of the standard repertoire,  
 Also, a portfolio of work showing concentrated activity on the major instrument or voice area.

**Learning Outcomes**

1. Graduate students will be excellent performers on voice or instrument.
2. Graduate students will demonstrate the advanced musical and pedagogical knowledge and research writing skills

necessary to begin their professional performing career and/or demonstrate their readiness to teach at the college and/or university level and/or pursue doctoral degrees.

**Program Specific Graduate Assistantships**

Graduate assistantships are awarded on a competitive basis to defray some of the costs of graduate study and to provide practical experience working under the guidance of faculty members.

Criteria that are taken into account in awarding assistantships include: academic preparation, performing ability, and special skills that would prove valuable in carrying out the duties of the assistantship, as well as, needs of the department.

To be considered for a graduate assistantship, the candidate must be fully admitted through the university. The application for an assistantship is considered separately within the Department of Music, although the applications may be made concurrently. After considering the merits of the application, the department then nominates candidates to the university.

Applications for assistantships are due in the department on March 1. Contact the music department for more information.

**Program Specific Degree Requirements**

**Master's Programs**

Each of the degree programs consists of 30 semester hours of work composed of the following elements:

- Basic music core (11 hours)  
 MUSC 5310. Bibliographical Research, 2 hours  
 Upper-division music history, 3 to 6 hours  
 Upper-division music theory, 3 to 6 hours
- Major area courses (12-16 hours)
- Thesis requirement (Plan A, four hours); (Plan B, zero hours)

The thesis requirement may be fulfilled under Plan A or Plan B as appropriate to the specific degree program. A proposal for a thesis or Plan B paper must be submitted to and approved by the Department of Music Graduate Committee.

Electives (0 to 7 hours)

**Master of Music Education****Plan A or Plan B**

To earn a Master of Music Education, students must complete the following requirements:

Basic music core, (11 hours)

Major area courses (12 - 15 hours)

EDRE 5530. Introduction to Research, 3 hours

MUSC 5760. Music Education Seminar, 2 hours

MUSC 5720. Music Supervision, 2 hours

Music education electives, 5-8 hours

Thesis requirement (0 to 4 hours)

Plan A: MUSC 5960. Thesis Research, four hours (the thesis must be on a music education topic), or

Plan B: Plan B paper, plus extra courses, 0 hours

Electives (4 to 7 hours)

**Master of Music in Performance****Plan B**

To earn a Master of Music in Performance, students must complete the following requirements:

Basic music core (11 hours minimum)

Major area courses (16 hours minimum)

MUSC 5480-5670. Private Lessons in major instrument or voice. A minimum of 8 hours.

MUSC 5770-5890. Ensembles, 2 hours

MUSC 5680. Graduate Recital, 2 hours.

A faculty jury must approve a recital given for credit one month prior to the performance. The faculty jury will determine the grade after the performance.

MUSC 5390. Performance Practice and Interpretation, 2 hours

MUSC 5320. Advanced Seminar, 3 hours

MUSC 4\*\*\*. Pedagogy (instrument specific), 2 hours

Requirement in lieu of thesis:

Plan B paper, or 1-hour lecture-recital

Foreign language requirement (voice majors only). Singers must demonstrate acceptable proficiency in singing in Italian, German, French, and English.

Electives (0 to 3 hours)

Both degrees require successful completion of the written comprehensive exams, which cover theory, history, and the major area.

**Music (MUSC)**

**Individual Lessons:** All students enrolled in MUSC 2080 through MUSC 5670 levels will be required to take a jury examination at the end of the semester to determine, in part, the final grade. (See current fee schedule for listing of fees in individual lessons.)

Students must receive a "C" or better in all courses designated MUSC to satisfy department degree requirements. A student's transfer courses in music must also reflect a "C" or better to be accepted for credit.

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB↔Q]).**

**0200. Music Convocation. 0.** Weekly recital hour for student, faculty and guest performances. *Prerequisite:* intended for, and required of music majors.

Applied Lessons:

**1080 through 1270 I. 1-2 (Max. 8).**

**2080 through 2270 II. 1-2 (Max. 8).** *Prerequisite:* previous training proven with an audition or 2-4 semester hours of MUSC 1080 through MUSC 1270 on the same instrument.

**3080 through 3270 III. 1-2 (Max. 8).** *Prerequisite:* 2-4 semester hours of MUSC 2080 through MUSC 2270 on the same instrument.

**4080 through 4270 IV. 1-2 (Max. 8).** *Prerequisite:* 2-4 semester hours of MUSC 3080 through MUSC 3270 on the same instrument.

*Majors begin at the 2000 level.*

**1080. Baritone Horn I**

**1090. Bassoon I**

**1100. Cello I**

**1110. Clarinet I**

**1120. Double Bass I**

**1130. Flute I**

**1140. French Horn I**

**1150. Guitar I**

**1160. Harp I**

**1170. Oboe I**

**1180. Organ I**

**1190. Percussion I**

**1200. Piano I**

**1210. Saxophone I**

**1220. Trombone I**

**1230. Trumpet I**

**1240. Tuba I**

**1250. Violin I**

**1260. Viola I**

**1270. Voice I**

**2080. Baritone Horn II**

**2090. Bassoon II**

**2100. Cello II**

**2110. Clarinet II**

**2120. Double Bass II**

**2130. Flute II**

**2140. French Horn II**

**2150. Guitar II**

**2160. Harp II**

**2170. Oboe II**

**2180. Organ II**

**2190. Percussion II**

**2200. Piano II**

**2210. Saxophone II**

**2220. Trombone II**

**2230. Trumpet II**

**2240. Tuba II**

**2250. Violin II**

**2260. Viola II**

**2270. Voice II**

**3080. Baritone Horn III**

**3090. Bassoon III**

**3100. Cello III**

**3110. Clarinet III**

**3120. Double Bass III**

**3130. Flute III**

**3140. French Horn III**

**3150. Guitar III**

**3160. Harp III**

**3170. Oboe III**

**3180. Organ III**

**3190. Percussion III**

**3200. Piano III**

**3210. Saxophone III**

**3220. Trombone III**

**3230. Trumpet III**

**3240. Tuba III**

**3250. Violin III**

**3260. Viola III**

**3270. Voice III**

*Prerequisites for the following courses: 2-4 semester hours of MUSC 3080 through MUSC 3270 on the same instrument and satisfactory completion of MUSC 3255.*

**4080. Baritone Horn IV**

**4090. Bassoon IV**

**4100. Cello IV**

**4110. Clarinet IV**

**4120. Double Bass IV**

**4130. Flute IV**

**4140. French Horn IV**

**4150. Guitar IV**

**4160. Harp IV**

**4170. Oboe IV**

**4180. Organ IV**

**4190. Percussion IV**

**4200. Piano IV**

**4210. Saxophone IV**

**4220. Trombone IV**

**4230. Trumpet IV**

**4240. Tuba IV**

**4250. Violin IV**

**4260. Viola IV**

**4270. Voice IV**

**1000. Introduction to Music. 3. [CA◀H]**

Introduces music appreciation to students who have little or no musical training. Requires attendance at a specified number of public concerts. (Offered every semester)

**1003. Introduction to University Life as a Music Major. 3. [I,L◀(none)]**

Preparation for study in the Western European classical tradition as represented in most American departments of music, in music of other cultures within American society, in other parts of the world, and in music making after graduation are focused upon. Developing information literacy is an essential component.

**1010. Music Fundamentals. 3.** To establish/review the foundation of the materials and structures of music theory fundamentals.

**1025 [1020]. Introduction to Music Education. 2.** Introduces music teacher education. Includes overview of vocal and instrumental music education and teaching processes in grade levels K-12. Requires on-site visits and observations of music programs. Prerequisite: music majors only. (Offered spring semester)

**1030. Written Theory I. 3.** First semester of a one-year series. Studies fundamentals of music and written harmony. Prerequisite: music majors/minors only.

**1035. Aural Theory I. 1.** First semester of a one-year series. Studies ear training and sight singing.

**1040. Written Theory II. 3.** Second semester of a one-year series. Studies fundamentals of music and written harmony. Prerequisite: MUSC 1030 and music majors/minors only.

**1045. Aural Theory II. 1.** Second semester of a one-year series. Studies ear training and sight singing. Prerequisite: MUSC 1035.

**1280. Collaborative Piano I. 1-2 (Max. 8).** Encompasses supervised practice in the art of collaborative piano playing. Discusses traditional usages as applicable to various schools and periods of vocal and instrumental duo literature. Prerequisite: audition required.

**1290. Elementary Class Piano I. 1.** Encompasses group instruction for the beginner at the keyboard. First semester of four-semester sequence. Enrollment limited to music or music education majors whose principal performance area is not piano. (Offered fall semester)

**1295. Elementary Class Piano II. 1.** Continues skills begun in MUSC 1290 including all major scales, beginning minor scales, prescribed chord progressions, harmonization,

transposition, sight reading and repertoire.

Prerequisite: MUSC 1290 or successful completion of final exam requirements for MUSC 1290. (Offered spring semester)

**1310. Public School Methods: Brass I. 1 (Max. 2).** Encompasses group instruction in brass instruments for music education majors. Instruments are supplied. Prerequisites: MUSC 1040, 1045.

**1315. Public School Methods: Brass II. 1 (Max. 2).** Encompasses group instruction in brass instruments for music education majors. Instruments are supplied. Prerequisites: MUSC 1040, 1045.

**1320. Public School Methods: Percussion I. 1 (Max. 2).** Encompasses group instruction in percussion instruments for music education majors. Instruments are supplied. Prerequisites: MUSC 1040, 1045.

**1325. Public School Methods: Percussion II. 1 (Max. 2).** Encompasses group instruction in percussion instruments for music education majors. Instruments are supplied. Prerequisites: MUSC 1040, 1045.

**1330. Public School Methods: Strings I. 1 (Max. 2).** Encompasses group instruction in string instruments for music education majors. Instruments are supplied. Prerequisites: MUSC 1040, 1045.

**1335. Public School Methods: Strings II. 1 (Max. 2).** Encompasses group instruction in string instruments for music education majors. Instruments are supplied. Prerequisites: MUSC 1040, 1045.

**1340. Public School Methods: Voice I. 1 (Max. 2).** Encompasses group instruction in vocal methods for music education majors. Prerequisites: MUSC 1040, 1045.

**1345. Public School Methods: Voice II. 1.** Group instruction in the vocal area for music education majors. Second semester of vocal methods which focuses on Choral Methods, Children's Choir, Jazz, and Musical Theater in the K-12 teaching situation. Prerequisite: MUSC 1340.

**1350. Public School Methods: Woodwinds I. 1 (Max. 2).** Encompasses group instruction in woodwind methods for music education majors. Instruments are supplied. Prerequisites: MUSC 1040, 1045.

**1355. Public School Methods: Woodwinds II. 1 (Max. 2).** Encompasses group instruction in woodwind methods for music education majors. Instruments are supplied. Prerequisites: MUSC 1040, 1045.

**1360. Public School Methods: Guitar. 1 (Max. 2).** Encompasses group instruction in guitar for music education majors. Instruments are supplied. Prerequisites: MUSC 1040, 1045.

**1370, 1375, 1380, 1390, 1400, 1420, 1430, 1440, 1450, 1460, 1470, 1480, 1490. Ensembles.** Maximum of 14 semester hours may be used toward the bachelor's degree from any combination of these courses. Music majors must play in one ensemble each semester in residence. Scholarship recipients must play in two ensembles each semester in residence.

**1370. Marching Band. 1 (Max. 8).** Fall semester: marching band.

**1375. Symphonic Band. 1 (Max. 8).** Prerequisite: players are selected by audition. Auditions will take place the first week of classes.

**1380. Wind Ensemble. 1 (Max. 8).** [CA◀(none)] Prerequisite: players are selected by audition from the university band.

**1390. Jazz Ensemble. 1 (Max. 8).** [(none)◀H] Preparation and performance in a select jazz ensemble of the finest in standard jazz ensemble repertory and contemporary compositions by living jazz artists. Prerequisites: audition required; restricted to freshmen and sophomores.

**1400. Collegiate Chorale I. 1 (Max. 12).** [CA◀H] Will provide the committed singer with outstanding performing experiences ranging from major choral masterworks to masterpieces of the *a cappella* tradition, both sacred and secular. The choir is a professional training ensemble, and each student will explore a variety of vocal techniques for development. Prerequisite: Audition required.

**1405. The UW Singing Statesmen I. 1 (Max 12).** [(none)◀H] Will provide all levels of singer with the rich tradition of male ensemble singing. Students will solidify basic musicianship skills and vocal technique while experiencing camaraderie and service to the region. This ensemble is open to both music majors and non-music majors without audition.

**1407. Happy Jacks I. 1 (Max 12).** Student-led male *a cappella* ensemble that sings contemporary, jazz, and traditional repertoire. The ensemble travels regularly to promote male singing through concerts and school workshops. Prerequisites: Audition required. Co-requisite: enrollment in The UW Singing Statesmen.

**1411. Vocal Jazz I. 1 (Max 12).** Sings standard repertory from various jazz traditions, often with rhythm section. Focus on building musical skill and literacy in the jazz idiom. Prerequisite: Audition required.

**1415. Bel Canto Women's Choruse. 1 (Max 12).** [(none)◀H] Builds community through score study and the development of fundamental musicianship skills, including sight singing, ear training, and vocal technique. This ensemble is open to both music majors and non-music majors without audition.

**1417. Laramie Civic Chorus I. 1 (Max 12).** [(none)◀▶H] Welcomes students, faculty, and community members. Repertoire includes musical works from a multiplicity of style periods and genres in both Western and non-Western traditions and includes regular collaboration with the UW Symphony Orchestra for major choral works. *Prerequisites:* Audition required.

**1420. Opera Theatre. 1 (Max. 8).**

**1430. Symphony Orchestra I. 1 (Max. 8).** [CA◀▶H] The premier orchestral ensemble in the Department of Music. Participation in this ensemble prepares students to perform some of the great symphonic literature from a wide variety of musical periods. *Prerequisite:* audition only, freshmen and sophomores.

**1440. Chamber Orchestra I. 1 (Max. 8).** Devoted to the rehearsal and performance of masterpieces from the chamber orchestra repertoire. Students in the 1440 level of Chamber Orchestra will be expected to have a competent level of proficiency on their parts.

**1450. Percussion Ensemble. 1 (Max. 8).** Present concerts that represent the literature and techniques of this growing genre in music.

**1460. Brass Ensemble. 1 (Max. 8).** The University of Wyoming Brass Ensemble is a course devoted to the rehearsal and performance of masterpieces from the brass chamber repertoire. Students in the 1460 level of Brass Ensemble will be expected to have a competent level of proficiency on their parts.

**1470. Woodwind Ensemble. 1 (Max. 8).** Preparation and performance in a select woodwind chamber ensemble of the finest standard and contemporary wind ensemble literature. Enrollment is restricted freshmen and sophomores. *Prerequisite:* audition required.

**1480. Chamber Music I. 1 (Max. 8).** Designed to provide students with training in the ideal medium of chamber music (small ensembles, such as trio, string quartet, etc.), where they can apply and integrate all elements of their musical knowledge. These include but are not limited to rhythm, intonation, tone-production, blend, musical interpretation, concept of style, etc. *Prerequisite:* audition required.

**1490. Piano Ensemble I. 1 (Max. 8).** Designed to provide students with training in the medium of piano duo and piano duet repertoire, where they can apply and integrate all elements of their musical knowledge. The include but are not limited to rhythm, tone-production, musical interpretation, concept of style, etc. *Prerequisite:* Audition required.

**1495. Baroque Ensemble I. 1.** Designed to provide students with the opportunity to play on period instruments of the Baroque era. The repertoire will primarily include music of the Seventeenth and Eighteenth Centuries

and whose performance will reflect the spirit and style of the period in which the music was composed. *Prerequisite:* consent of instructor.

**2030. Written Theory III. 3.** First semester of a one-year series. Studies chromatic harmony, contrapuntal techniques and twentieth-century practices. *Prerequisites:* MUSC 1030 and 1040.

**2035. Aural Theory III. 1.** First semester of a one-year series. Continues MUSC 1035 and 1045. *Prerequisites:* MUSC 1035 and 1045.

**2040. Written Theory IV. 3.** Second semester of a one-year series. Studies chromatic harmony, contrapuntal techniques and twentieth-century practices. *Prerequisite:* MUSC 2030.

**2045. Aural Theory IV. 1.** Second semester of a one-year series. Continues MUSC 1035 and 1045. *Prerequisite:* MUSC 2035.

**2050. Historical Survey I. 3 (Max. 6).** [CA◀▶(none)] First semester of a one-year series. Studies history and literature of music from antiquity through the Baroque. *Prerequisite:* ability to read music.

**2055. Historical Survey II. 3 (Max. 6).** Second semester of one-year series. Studies history and literature of music from the classical era to present. *Prerequisite:* ability to read music.

**2290. Elementary Class Piano III. 1.** Third semester of four-semester sequence developing further piano skills for non-pianists. Involves prescribed scales, arpeggios, harmonizations, chord progressions, transpositions, sight-reading and repertoire. *Prerequisite:* MUSC 1295 or successful completion of final exam for MUSC 1295. (Normally offered fall semester)

**2295. Elementary Class Piano IV. 1.** Final semester of four-semester sequence of piano skills for non-pianists in which the final exam is the departmental piano proficiency exam. *Prerequisite:* MUSC 2290 or successful completion of the final exams for preceding courses. (Normally offered spring semester)

**2320. Diction for Singers I. 2.** Studies phonetic sounds of English and Italian. (Offered fall semester)

**2325. Diction for Singers II. 2.** Studies phonetic sounds of French and German. (Usually offered spring semester)

**2395. Piano Proficiency. 0.** Piano proficiency test is offered at the end of each fall and spring semester. Students may enroll in MUSC 2395 a maximum of 2 times. Consult the Music Department Handbook for specific requirements.

**3015 [2015]. Introduction to the Music of the World's Peoples. 3.** [WB,G◀▶(none)] Students develop three primary interconnected literacies for the study and understanding of musics of other cultures: analytical music listening, understanding the concept of music culture, and interpretation of musical events. Student writing is a primary tool for develop-

ing these literacies. Texts from the Oxford University Press Global Music Series to study musics of Africa, Indonesia, India, and Eastern Europe are used. Cross listed with ANTH 3015. *Prerequisites:* MUSC 1000 or permission of instructor and WA.

**3020. Jazz Theory and Improvisation I. 2.** Introduces methods and materials of jazz improvisation. Students will grapple with theoretical concepts as well as practical application of those concepts or selections from standard repertoire. *Prerequisites:* MUSC 1030 and 1035.

**3025. Jazz Theory and Improvisation II. 2.** Continuation of Jazz Theory and Improvisation I, MUSC 3020. More advanced topics will be covered and more challenging repertoire will be explored. A strong emphasis will be placed on common practice techniques in mainstream jazz. *Prerequisite:* MUSC 3020.

**3255. Sophomore Qualifying Performance Jury. 0.** An extended performance jury at the end of the sophomore year. Music majors may not continue to 4000-level lessons without successful completion of the sophomore jury. Transfer students with junior standing must take the jury at the end of their first semester in residence. Contact your studio teacher for the individual Sophomore Jury requirements. Students may register for this course up to 2 times. *Prerequisites:* 4 semesters of private instruction, consent of instructor.

**3280. Collaborative Piano II. 1-2 (Max 8).** Encompasses supervised practice in the art of collaborative piano playing. Discusses traditional usages as applicable to various schools and periods of vocal and instrumental duo literature. *Prerequisite:* audition required.

**3380. Wind Ensemble II. 1 (Max. 8).** Preparation and performance in a select concert band of the finest in contemporary and classic wind and percussion repertory. *Prerequisites:* audition required, MUSC 1380 or equivalent and junior standing.

**3385. World Music Ensemble. 1 (Max 6).** Participate fully in music making in Sikuris de Wyoming, the Wyoming Gamelan Candra Wyoga, or the Laramie Irish tune session. These group music-making opportunities are distinctly different from other leader-focused ensembles offered in the Department of Music. *Prerequisites:* MUSC 1000 or MUSC 1003.

**3390. Jazz Ensemble II. 1 (Max. 8).** [(none)◀▶H] Preparation and performance in a select jazz ensemble of the finest in jazz repertory. *Prerequisites:* audition required, MUSC 1390 or equivalent and junior standing.

**3400. Collegiate Chorale II. 1 (Max. 12).** [(none)◀▶H] Provide the advanced and committed singer with outstanding performing experiences ranging from major choral

masterworks to masterpieces of the *a cappella* tradition, both sacred and secular. The choir is a professional training ensemble and students may be asked to take on leadership roles. Commitment of time to advance the excellence and public awareness of the ensemble will be required. *Prerequisites:* audition required, and junior standing or above.

**3405. UW Singing Statesmen II. 1 (Max 12).** [(none)◀H] Provides all levels of singer with the rich tradition of male ensemble singing. Solidify basic musicianship skills and vocal technique while experiencing camaraderie and service to the region. May be asked to take on leadership roles to advance public awareness. Open to music majors and non-music majors without audition. *Prerequisite:* Junior standing or above.

**3407. Happy Jacks II. 1 (Max 12).** Student-led male *a cappella* ensemble that sings contemporary, jazz, and traditional repertoire. Upperclass students may be asked to take on leadership roles. Ensemble travels regularly to promote male singing through concerts and school workshops. *Prerequisites:* Audition only. Co-requisite: enrollment in The UW Singing Statesmen.

**3411. Vocal Jazz II. 1 (Max 12).** Sings standard repertoire from various jazz traditions, often with rhythm section. Focus on building musical skill and literacy in the jazz idiom. Students may be asked to take on leadership roles. *Prerequisites:* Audition required. Junior standing or above.

**3415. Bel Canto Women's Chorus II. 1 (Max 12).** [(none)◀H] Builds community through score study and the development of fundamental musicianship skills, including sight singing, ear training, and vocal technique. May be asked to take on leadership roles. This ensemble is open to music majors and non-music majors without audition. *Prerequisite:* Junior standing or above.

**3417. Laramie Civic Chorus II. 1 (Max 12).** [(none)◀H] Welcomes students, faculty, and community members. Repertoire includes musical works from a multiplicity of style periods and genres in both Western and non-Western traditions and includes regular collaboration with the UW Symphony Orchestra for major choral works. Students may be asked to take on leadership roles. *Prerequisite:* Junior standing or above; audition required.

**3430. Symphony Orchestra II. 1 (Max. 8).** [(none)◀H] Preparation and performance in a select symphony orchestra of the finest in orchestral repertoire. *Prerequisites:* audition required, MUSC 1430 or equivalent and junior standing.

**3440. Chamber Orchestra II. 1 (Max. 8).** Devoted to the rehearsal and performance of masterpieces from the chamber orchestra repertoire. Students in the 3440 level of Chamber Orchestra will be expected to have a competent level of proficiency on their parts.

**3450. Percussion Ensemble II. 1 (Max. 8).** A chamber music ensemble, performing repertoire which encompasses classical percussion literature, ethnic drumming styles, and steel drum ensemble. Designed for the advanced undergraduate who has normally attained a higher level of technical ability in percussion by their junior/senior year. *Prerequisites:* four semesters of MUSC 1450 or equivalent and junior standing.

**3460. Brass Ensemble II. 1.** The University of Wyoming Brass Ensemble is a course devoted to the rehearsal and performance of masterpieces from the brass chamber repertoire. Students in the 3460 level of Brass Ensemble will be expected to have a competent level of proficiency on their parts and assume leadership roles in the ensemble.

**3470. Woodwind Ensemble II. 1 (Max. 8).** Preparation and performance in a select woodwind chamber ensemble of the finest standard and contemporary wind ensemble literature. Enrollment is restricted to juniors and seniors. *Prerequisites:* audition required; MUSC 1470, and junior standing.

**3480. Chamber Music II. 1. [CA◀(none)]** Designed to provide students with training in the ideal medium of chamber music (small ensembles, such as trio, string quartet, etc.), where they can apply and integrate all elements of their musical knowledge. These include but not limited to rhythm, intonation, tone-production, blend, musical interpretation, concept of style, etc. *Prerequisites:* consent of instructor; MUSC 1480 and junior standing.

**3490. Piano Ensemble II. 1 (Max 8).** Training in the medium of piano duo and piano duet repertoire, apply and integrate all elements of musical knowledge. These include but are not limited to rhythm, tone-production, musical interpretation, concept of style, etc. *Prerequisites:* consent of instructor; Audition required. Juniors or Seniors.

**3495. Baroque Ensemble II. 1.** Designed to provide students with the opportunity to play on period instruments of the Baroque era. The repertoire will primarily include music of the Seventeenth and Eighteenth Centuries and whose performance will reflect the spirit and style of the period in which the music was composed. *Prerequisites:* completion of sophomore barrier exam and consent of instructor.

**3500. Junior Recital. 0.** Students will perform a 30 minute (minimum) recital of appropriate repertoire. Consult your studio teacher for individual studio requirements. *Prerequisites:* 4 semesters of private instruction, consent of instructor.

**4010. Counterpoint. 3.** Project-oriented, taught with close instructor supervision. Students absorb basic elements of counterpoint and analyze appropriate examples taken from samples of contrapuntal works written over past 300 years, then write five contrapuntal works in diverse styles. *Prerequisite:* MUSC 2040.

**4020. Jazz Theory and Improvisation III. 2.** Continuation of Jazz Theory and Improvisation II, MUSC 3025. Students will learn the harmonic and melodic language of bebop and hard bop through performance and composition of tunes in these idioms. *Prerequisite:* MUSC 3025.

**4025. Jazz Theory and Improvisation IV. 2.** Continuation of Jazz Theory and Improvisation III, MUSC 4020. Students explore developments in jazz improvisation and composition since 1960. Advanced theoretical concepts are covered in lectures and workshop sessions. *Prerequisite:* MUSC 4020.

**4030. Form and Analysis. 3.** Encompasses harmonic, thematic, formal and stylistic analysis of selected works representative of various periods. For graduate credit, students must present extra paper or project determined by instructor. *Prerequisites:* MUSC 2030 and 2035.

**4040. Composition. 2 (Max. 12).** Encompasses original work in construction of smaller forms. For graduate credit, students must present extra paper or project determined by instructor. *Prerequisite:* MUSC 4010.

**4050. Advanced Studies in World Music. 3.** Focuses on music-making and cultures of three musical traditions from around the world. *Prerequisite:* MUSC 3015.

**4060. Applied Composition Lessons. 1-2 (max. 12).** Students meet on a weekly basis with the instructor and work on individual composition projects and exercises. Students will be required to take a juried portfolio examination at the end of the semester to determine, in part, the final grade. *Prerequisite:* Previous training proven with a portfolio/audition or MUSC 4040.

**4070. Conducting. 3.** Examines basic techniques of baton, score reading, familiarization with standard works, practical experience in directing choral and instrumental groups. For graduate credit, students must present extra paper or project determined by instructor. *Prerequisites:* MUSC 2030, 2035, 2040 and 2045.

- 4155. Senior Music Education Recital. 0.** Music Education students perform a recital which may be a part of a Convocation or a separate performance. Consult your studio teacher for individual studio requirements. *Prerequisites:* senior standing and studio teacher consent.
- 4255. Elementary and Secondary Methods: Practicum. 2.** Part of Phase IIIa of the music teacher education program. Practicum experience is integral to MUSC 4265 and must be taken concurrently. *Prerequisites:* 2.75 cumulative GPA, successful completion of all music and professional education courses and concurrent enrollment in MUSC 4265. (Offered fall semester)
- 4265. Elementary and Secondary Music Teaching Methods. 8. [(none)◀COM3]** Comprised of content and pedagogy in Music. Must be taken in the same semester as the 2 semester hour course, MUSC 4255. *Prerequisites:* 2.75 minimum cumulative GPA, 2.75 GPA in major, successful completion of all music and professional education courses and concurrent enrollment in MUSC 4255. (Offered fall semester).
- 4300. Instrumentation and Arranging. 3.** Explores instruments of the orchestra and band, as well as arranging for various instrumental and choral combinations. For graduate credit, students must present extra paper or project determined by instructor. *Prerequisites:* MUSC 2030, 2035, 2395.
- 4310. Choral Arranging. 2.** Teaches working techniques of arranging for the voice in varied combinations of choral ensembles. For graduate credit, students must present extra paper or project determined by instructor. *Prerequisites:* MUSC 2030 and 2035.
- 4315 [3000]. America's Ethnic Music. 3. [CA,D▶(none)]** Surveys music of ethnic groups in America. *Prerequisite:* MUSC 1000.
- 4320, 4325, 4330, 4335, 4340, 4345. Historical Period Courses.** See individual descriptions below.
- 4320. Medieval Period. 3.** Intensely studies Middle Ages musical literature. For graduate credit, students present extra paper or project determined by instructor. *Prerequisites:* MUSC 2050 and 2055.
- 4325. Renaissance Period. 3.** Encompasses concentrated survey and analysis of Renaissance music. For graduate credit, students must present extra paper or project to be determined by instructor. *Prerequisites:* MUSC 2050 and 2055.
- 4330. The Baroque Period. 3. [(none)◀COM3]** Studies origins of Baroque literature. For graduate credit, students must present extra paper or project determined by instructor. *Prerequisites:* MUSC 2050 and 2055.
- 4335. The Classical Period. 3.** Encompasses concentrated survey and style analysis of classical period's music. For graduate credit, students must present extra paper or project determined by instructor. *Prerequisites:* MUSC 2050 and 2055.
- 4340. The Romantic Period. 3. [CA▶COM3]** Surveys romantic musical literature. For graduate credit, students must present extra paper or project to be determined by instructor. *Prerequisites:* MUSC 2050 and 2055.
- 4345. Contemporary Period. 3.** Surveys styles and composers of contemporary period. For graduate credit, students must present extra paper or project determined by instructor. *Prerequisites:* MUSC 2050 and 2055.
- 4350. History and Literature of Jazz. 3.** Surveys details of American jazz music from the turn of the century to present. Acquaints students with basic jazz materials, techniques and styles, as well as work of selected jazz masters. For graduate credit, students must present extra paper or project determined by instructor. *Prerequisite:* consent of instructor.
- 4380. Jazz Techniques. 2 (Max. 2).** Surveys jazz structure, styles, techniques and materials with respect to public school music programs. Intended for music education major. *Prerequisite:* MUSC 2035. (Offered spring semester)
- 4400. Vocal Literature. 1/2-2 (Max. 6).** Studies solo materials from Renaissance to present, emphasizing style and interpretation. *Prerequisite:* 4 semester hours of voice.
- 4500. Directed Independent Study-Undergraduate. 1-2 (Max. 4).** *Prerequisite:* consent of department head.
- 4510, 4520, 4530, 4540, 4550, 4560. Applied Music Methods and Materials.** Courses taken in the form of private lessons and subject to similar fees. See individual descriptions below. *Prerequisite:* at least 16 semester hours in one performance field and/or consent of instructor.
- 4510. Brass Instruments. (\$85 Fee) 1 (Max.2).**
- 4520. Organ. (\$85 Fee) 1 (Max. 2).**
- 4530. Piano. (\$85 Fee) 1 (Max. 2).**
- 4540. Woodwind Instruments. (\$85 Fee) 1 (Max. 2).**
- 4550. Stringed Instruments. (\$85 Fee) 1 (Max. 2).**
- 4560. Voice. (\$100 Fee) 1 (Max. 2).**
- 4590. Senior Recital. 2 (Max. 4).** *Prerequisites:* at least 14 semester hours in one performance field and senior standing.
- 4600. Piano Pedagogy. 0.5-2 (Max. 3).** Includes critical study and evaluation of piano teaching methods and materials. *Prerequisite:* 8 credit hours of piano study.
- 4610. Vocal Pedagogy. 0.5-2 (Max. 3).** Surveys techniques, practices and materials. *Prerequisite:* 8 credit hours of voice. (Offered spring semester)
- 4615. Instrumental Pedagogy. 0.5-2 (Max. 3).** Surveys teaching materials in solo and chamber literature, techniques, practices, and methods for applicable instrument. *Prerequisite:* 8 credit hours of individual study in a specific instrument.
- 4620. Practicum in Music Education. 1.** Provides opportunity to gain experience in music classroom in area public schools. Includes work on meeting educational standards of Wyoming necessary to begin student teaching and continued work on developing a teaching portfolio. *Prerequisites:* MUSC 1050 and junior status.
- 4650. Keyboard Literature. 3.** An overview of solo ensemble keyboard literature from the 1600s to the present, focusing on major composers and common compositional forms. Includes listening assignments and examinations as well as individual research papers and class presentations. *Prerequisites:* MUSC 2050 and 2055.
- 4651. String Solo Literature. 3.** Provide a survey of the masterpieces of string solo literature (violin,viola, cello and bass literature) in a historical and musical context. Includes listening assignments and examinations as well as class presentations. *Prerequisites:* 8 hours of lessons in string instruments.
- 4652. String Chamber Literature. 3.** Provide a survey of the masterpieces of string chamber literature in a historical and musical context. Includes listening assignments and examinations as well as class presentations. *Prerequisites:* 8 hours of lessons in string instruments.
- 4700. Elementary Student Teaching in Music. 8.** The final professional academic semester of the teacher education program. A full-time residency with an elementary mentor teacher. Offered Satisfactory/Unsatisfactory only. *Prerequisites:* 2.75 cumulative GPA, 3.0 GPA in major content courses, completion of all content courses, successful completion of Phase IIIa specific pedagogy and practicum, complete review of the prospective teacher's record.
- 4710. Secondary Student Teaching in Music. 8.** The final professional academic semester of the teacher education program. A

full-time residency with a secondary mentor teacher. Offered. Satisfactory/Unsatisfactory only. *Prerequisites:* 2.75 cumulative GPA, 3.0 GPA in major content courses, completion of all content courses, successful completion of Phase IIIa specific pedagogy and practicum, complete review of the prospective teacher's record.

**4750. Marching Band Techniques. 1.** Applies specific various drill design techniques including corps style, military, show band and computer applications.

**4780. Instrumental Conducting and Repertory. 2.** Applies specific basic conducting techniques to instrumental group rehearsals concerning such problems as intonation, phrasing, dynamics, balance, etc. Overviews appropriate selection procedures for band and orchestral literature. *Prerequisite:* MUSC 4070 and 2395.

**4790. Choral Conducting and Repertory. 2.** Applies specific basic conducting techniques to choral group rehearsals concerning such problems as intonation, good vocal production, phrasing, diction, dynamics, balance, etc. Overviews appropriate choral literature. *Prerequisite:* MUSC 4070 and passed piano proficiency requirement.

**4990. Topics in \_\_\_\_\_.** 1-12 (Max. 12). Encompasses various topics in music. Specific subjects vary from year to year as course is often taught by distinguished visiting artists and lecturers or music faculty. Presents topics of special interest to music majors, graduate students and music educators. Please check class schedule for course titles each semester. *Prerequisite:* consent of instructor.

**5010. Mentoring the Pre-Service Music Educator. 1 (Max. 4).** Designed for K-12 supervisors of pre-service music teachers, the goal of the course is to provide guidance and theoretical grounding through readings, discussion, journaling, and research projects. Participants will participate in two on-site workshops, weekly tele-conferences and complete a written research project. *Prerequisite:* consent of instructor.

**5030. Advanced Theory I. 3.** First semester of a one-year course. Analysis of, and practice in, the more recent harmonic idioms with advanced aural and keyboard harmony. *Prerequisite:* MUSC 2030, 2035.

**5080. Baritone Horn V. 1-2 (Max. 8).** *Prerequisite:* 2-4 semester hours of MUSC 4080 on the same instrument or graduate standing.

**5090. Bassoon V. 1-2 (Max. 8).**

**5100. Cello V. 1-2 (Max. 8).**

**5110. Clarinet V. 1-2 (Max. 8).**

**5120. Double Bass V. 1-2 (Max. 8).**

**5130. Flute V. 1-2 (Max. 8).**

**5140. French Horn V. 1-2 (Max. 8).**

**5150. Guitar V. 1-2 (Max. 8).**

**5160. Harp V. 1-2 (Max. 8).**

**5170. Oboe V. 1-2 (Max. 8).**

**5180. Organ V. 1-2 (Max. 8).**

**5190. Percussion V. 1-2 (Max. 8).**

**5200. Piano V. 1-2 (Max. 8).**

**5210. Saxophone V. 1-2 (Max. 8).**

**5220. Trombone V. 1-2 (Max. 8).**

**5230. Trumpet V. 1-2 (Max. 8).**

**5240. Tuba V. 1-2 (Max. 8).**

**5250. Violin V. 1-2 (Max. 8).**

**5260. Viola V. 1-2 (Max. 8).**

**5270. Voice V. 1-2 (Max. 8).**

**5310. Music Research Methods. 2.** Prepares students to be knowledgeable consumers of music and interdisciplinary information. Topics include the musicology research process, information ethics, and critical analyses and integration of information sources into writing. Information literacy principles and research techniques equip students for both graduate-level music research and the post-graduate, professional world. *Prerequisite:* graduate standing in music.

**5320. Advanced Seminar. 2-6 (Max. 6).** Such topics as The Music of J.S. Bach, The Chamber Music of Mozart, and Contemporary Music will be pursued and will terminate in oral reports and a research paper. *Prerequisite:* MUSC 5310.

**5330. Advanced Instrumentation and Arranging. 1-3 (Max. 3).** Continued practice in choral and instrumental scoring. A work of large design will be adapted for performance by one of the organizations within the division. *Prerequisite:* MUSC 4300.

**5340. Advanced Composition. 1-4 (Max. 6).** A project course to be conducted by individual appointment with the instructor. The result should be the production of a major work suitable for performance by one of the campus organizations. Evaluation is made by a faculty committee on completion and performance of the composition. *Prerequisite:* 4 hours of MUSC 4040.

**5350. Advanced Analysis. 3.** Consideration of the analytical techniques of Harder, Piston, and Schillinger for traditional music, of Hanson and Hindemith for modern tonal music, and of Schoenberg and Reti for serial music. *Prerequisite:* graduate standing in music.

**5360. Pedagogy of Theory. 2.** Consideration of the subject matter of all undergraduate theory courses, procedures for presenting the material, and analysis and evaluation of texts and methods. *Prerequisite:* graduate standing in music.

**5370. Advanced Choral Conducting. 1-2 (Max. 3).** The interpretation of well-known oratorios and cantatas; experience in the direction of campus choral groups. *Prerequisite:* MUSC 4070, 4790.

**5380. Advanced Instrumental Conducting. 1-2 (Max. 3).** Interpretive analysis of instrumental works in large form; experience in the direction of campus performing groups. *Prerequisite:* MUSC 4070, 4780.

**5390. Performance Practice and Interpretation. 2.** A study of the inherited traditions of correct interpretation and performance as related to the various style periods in music. *Prerequisite:* graduate standing in music.

**5400. Independent Study and Research. 1-2 (Max. 6).** *Prerequisite:* graduate standing and consent of instructor.

**5410. History of Musical Instruments. 2.** An investigation of the mechanical evaluation of musical instruments as related to the music written for these instruments. *Prerequisite:* graduate standing in music.

**5480. Baritone Horn VI. 1-2 (Max. 8).**

**5490. Bassoon VI. 1-2 (Max. 8).**

**5500. Cello VI. 1-2 (Max. 8).**

**5510. Clarinet VI. 1-2 (Max. 8).**

**5520. Double Bass VI. 1-2 (Max. 8).** Covers appropriate technical and repertory materials in graduate-level double bass. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

**5530. Flute VI. 1-2 (Max. 8).** Designed to cover appropriate technical and repertory materials in graduate-level flute. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

**5540. Guitar VI. 1-2 (Max. 8).** Designed to cover appropriate technical and repertory materials in graduate-level guitar. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

**5550. Harp VI. 1-2 (Max. 8).** Designed to cover appropriate technical and repertory materials in graduate-level harp. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

**5560. French Horn VI. 1-2 (Max. 8).** *Prerequisite:* 4 semester hours of MUSC 4560 or graduate standing.

**5570. Oboe VI. 1-2 (Max. 8).** *Prerequisite:* 4 semester hours of MUSC 4570 or graduate standing.

**5580. Organ VI. 1-2 (Max. 8).** Designed to cover appropriate technical and repertory materials in graduate-level organ. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.



**5590. Percussion VI. 1-2 (Max. 8).** Designed to cover appropriate technical and repertory materials in graduate-level percussion. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

**5600. Piano VI. 1-2 (Max. 8).** Designed to cover appropriate technical and repertory materials in graduate-level piano. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

**5610. Saxophone VI. 1-2 (Max. 8).** Designed to cover appropriate technical and repertory materials in graduate-level sax. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

**5615. Capstone. 3.** Designed to provide a forum to present research in music that fulfills requirements of the Plan B process. Instruction is individualized, but involves cooperative learning opportunities with other students. The student presents the finished product to the class members. Course is restricted to students doing Plan B paper only. *Prerequisite:* Plan B proposal approved by the music department graduate committee.

**5620. Trombone VI. 1-2 (Max. 8).** Designed to cover appropriate technical and repertory materials in graduate-level trombone. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

**5630. Trumpet VI. 1-2 (Max. 8).** Designed to cover appropriate technical and repertory materials in graduate-level trumpet. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

**5640. Tuba VI. 1-2 (Max. 8).** Designed to cover appropriate technical and repertory materials in graduate-level tuba. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

**5650. Violin VI. 1-2 (Max. 8).** Designed to cover appropriate technical and repertory materials in graduate-level violin. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

**5660. Viola VI. 1-2 (Max. 8).** Designed to cover appropriate technical and repertory materials in graduate-level viola. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

**5670. Voice VI. 1-2 (Max. 8).** Designed to cover appropriate technical and repertory materials in graduate-level voice. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

**5680. Graduate Recital. 2.** A recital, vocal or instrumental and consisting of selections of advanced difficulty in matters of technique and interpretation, is presented under the di-

rection of a staff member. Quality and content of recital must be approved by a faculty committee one month before the recital date, and the faculty committee will determine the final grade. *Prerequisite:* graduate standing in music and consent of instructor.

**5690. Advanced Teaching Methods - Brass. 1.** Designed to present new and improved methods of teaching the various band and orchestral instruments in the public schools.

**5700. Advanced Teaching Methods - String. 1.** Designed to present new and improved methods of teaching the various band and orchestral instruments in the public schools.

**5710. Advanced Teaching Methods - Woodwind. 1.** Designed to present new and improved methods of teaching the various band and orchestral instruments in the public schools.

**5720. Musical Supervision: Choral. 2.** Examination of the administrative responsibilities of the music teacher, the music department chairman, and the district music supervisor in the public schools, as well as the responsibilities of a music festival chairman and officers of the state music educators association. *Prerequisite:* graduate standing in music.

**5730. Musical Supervision: Instruments. 2.** Examination of the administrative responsibilities of the music teacher, the music department chairman, and the district music supervisor in the public schools, as well as the responsibilities of a music festival chairman and officers of the state music educators association. *Prerequisite:* graduate standing in music.

**5740. Choral Techniques and Materials. 1 (Max. 1.2).**

**5750. Band Techniques and Materials. 1 (Max. 1.2).**

**5760. Music Education Seminar. 2.** A study and discussion of trends, objectives, and curricula of the various phases of music education.

**5770. Marching Band. 0.5 (Max. 2).**

**5780. Wind Ensemble III. 0.5 (Max. 2).** One of the elite ensembles in the Department of Music, Wind Ensemble offers participants the opportunity to prepare and perform some of the finest, most technically challenging, contemporary and classic wind and percussion repertory. *Prerequisites:* graduate or Performer's Certificate students, audition required.

**5790. Jazz Ensemble III. 0.5 (Max. 2).** Preparation and performance in a select jazz ensemble of the finest in standard jazz ensemble repertory and contemporary compositions by living jazz artists. Enrollment is restricted to graduate and Performer's Certificate students only. *Prerequisites:* audition required.

**5800. Collegiate Chorale III. 0.5 (Max. 12).** Provide the advanced and committed singer with outstanding performing experiences ranging from major choral masterworks to masterpieces of the *a cappella* tradition, both sacred and secular. The choir is a professional training ensemble and students may be asked to take on active musical leadership roles. Commitment of time to advance the excellence and public awareness of the ensemble will be required. *Prerequisites:* audition required, and graduate standing.

**5805. The UW Singing Statesmen III. 0.5 (Max 12).** The UW Singing Statesmen provides all levels of singers with the rich tradition of male ensemble singing. Students will solidify basic musicianship skills and vocal technique while experiencing camaraderie and service to the region. Students may be asked to take on music leadership roles and advance the excellence and public awareness of the ensemble. Open to music majors and non-music majors without audition. *Prerequisite:* Graduate standing.

**5807. Happy Jacks III. 0.5 (Max 12).** Student-led male *a cappella* ensemble that sings contemporary, jazz, and traditional repertoire. The ensemble travels regularly to promote male singing through concerts and school workshops. Students may act as musical director. Audition only. Co-requisite: enrollment in The UW Singing Statesmen. *Prerequisites:* Audition required. Graduate standing.

**5811. Vocal Jazz III. 0.5 (Max 12).** Sing standard repertory from various jazz traditions, often with rhythm section. Focus on building musical skill and literacy in the jazz idiom. Students may be asked to take on leadership roles. Audition only. *Prerequisites:* Audition required. Graduate standing.

**5815. Bel Canto Women's Chorus III. 0.5 (Max 12).** Builds community through score study and the development of fundamental musicianship skills, including sight singing, ear training, and vocal technique. Students may be asked to take on leadership roles. This ensemble is open to both music majors and non-music majors without audition. *Prerequisite:* Graduate standing.

**5817. Laramie Civic Chorus III. 0.5 (Max 12).** Welcomes students, faculty, and community members. Repertoire includes musical works from a multiplicity of style periods and genres in both Western and non-Western traditions and includes regular collaboration with the UW Symphony Orchestra for major choral works. Students may be asked to take on leadership roles. *Prerequisite:* Graduate standing; audition required.

**5820. Opera Theatre. 0.5 (Max. 2).**

**5830. Symphony Orchestra III. 0.5 (Max. 2).** The premier orchestral ensemble in the Department of Music. Participation in this ensemble prepares students to perform some of the great symphonic literature from a wide variety of musical periods. *Prerequisites:* graduate or Performer's Certificate students; audition required.

**5840. Chamber Orchestra. 0.5-1. (Max. 2).** Devoted to the rehearsal and performance of masterpieces from the chamber orchestra repertoire. Students in the 5840 level of Chamber Orchestra will be expected to assume leadership roles within the ensemble, help with bowings, lead sectionals and be highly proficient on their individual parts.

**5850. Percussion Ensemble. 0.5 (Max. 2).**

**5860. Brass Ensemble III. 0.5 (Max. 2).** The University of Wyoming Brass Ensemble is a course devoted to the rehearsal and performance of masterpieces from the brass chamber repertoire. Students in the 5860 level of Brass Ensemble will be expected to have a high level of proficiency on their parts and assume leadership roles within the ensemble.

**5870. Woodwind Ensemble III. 0.5 (Max. 2).** Preparation and performance in a select woodwind chamber ensemble of the finest standard and contemporary wind ensemble literature. *Prerequisites:* graduate or Performer's Certificate students; audition required.

**5880. Chamber Music III. 0.5 (Max. 2).** Designed to provide students with training in the ideal medium of chamber music (small ensembles, such as trio, string quartet, etc.), where they can apply and integrate all elements of their musical knowledge. These include but are not limited to rhythm, intonation, tone-production, blend, musical interpretation, concept of style, etc. *Prerequisites:* graduate or Performer's Certificate students; audition required.

**5885. Collaborative Piano III. 1-2 (Max. 8).** Encompasses supervised practice in the art of collaborative piano playing. Discusses traditional usages as applicable to various schools and periods of vocal and instrumental duo literature. *Prerequisites:* Audition required; MUSC 3280 or equivalent and graduate standing.

**5890. Piano Ensemble III. 0.5-1 (Max. 2).** Designed to provide students with training in the medium of piano duo and piano duet repertoire, where they can apply and integrate all elements of their musical knowledge. These include but are not limited to rhythm, tone-production, musical interpretation, concept of style, etc. *Prerequisites:* consent of instructor; Audition required. Performer's Certificate and Graduate students.

**5895. Baroque Ensemble III. 1 (Max. 1.2).**

Designed to provide students with the opportunity to play on period instruments of the Baroque era. The repertoire primarily includes music of the Seventeenth and Eighteenth Centuries and whose performance practices reflect the spirit and style of the period in which the music was composed. *Prerequisite:* consent of instructor.

**5900. Practicum in College Teaching. 1-3.**

**(Max. 3).** Work in classroom with a major professor. Students are expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Philosophy

122 Ross Hall, 766-3204

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**Web site:** [www.uwyo.edu/philosophy](http://www.uwyo.edu/philosophy)

**E-mail:** [philosophy@uwyo.edu](mailto:philosophy@uwyo.edu)

**Department Head:** Franz-Peter Griesmaier

### Professors:

**HARVEY HIX**, B.A. Belmont College 1982; M.A. University of Texas, Austin 1985; Ph.D. 1987; Professor of Philosophy 2013.

**JEFFREY A. LOCKWOOD**, B.S. New Mexico Institute of Mining and Technology 1982; Ph.D. Louisiana State University 1985; Professor of Philosophy 2006.

### Associate Professors:

**SUSANNA L. GOODIN**, B.A. Texas Technical University 1981; M.A. Rice University 1985; Ph.D. 1990; Associate Professor of Philosophy 1998, 1992.

**FRANZ-PETER GRIESMAIER**, University of Vienna 1986; M.A. University of Colorado 1988; Ph.D. University of Arizona 1997; Associate Professor of Philosophy 2006, 2000.

**EDWARD D. SHERLINE**, B.A. Princeton University 1982; M.A. University of Chicago 1983; Ph.D. University of Illinois-Chicago 1990; Associate Professor of Philosophy 1996, 1989.

### Adjunct Professor:

**ROBIN HILL**, B.A. University of Wyoming 1975; M.A. University of East Anglia 1978; M.S. University of Arizona 1981; Ph.D. State University of New York at Buffalo 1994; Adjunct Professor in Philosophy 1996.

### Academic Professional Lecturer:

**ROBERT S. COLTER**, B.A. The University of Puget Sound 1992; M.A. University of Colorado 1995; Ph.D. Northwestern University 2001; Academic Professional Lecturer 2013, 2007.

### Professors Emeriti:

James Forrester, Richard L. Howey, James A. Martin, Carlos Mellizo-Guadrado

Philosophy starts with those hard questions we all ask at some time or another. Some important questions of meaning and justification can't be answered by making observations or doing experiments. Philosophy is the effort to deal with these problems through sustained, hard, and critical thinking. Philosophy is good preparation for careers that call for you to use your mind, without prejudice but with rigor.

The Philosophy Department offers an undergraduate major, three undergraduate minors, and a graduate MA.

For details on each of these programs, see the department's web site.

## Undergraduate Major

A philosophy major must earn a C or better in 11 philosophy courses, including three courses at or above the 4000-level and five additional courses at or above the 3000-level. Our courses fall into four program areas: metaphysics and epistemology; ethics and philosophy of value; logic and philosophy of science; and history of philosophy. In each of these areas, there are two core courses. Philosophy majors choose three of the four distribution areas; they take at least two courses, including a core course, in each of the chosen areas. All prospective majors should take Introduction to Philosophy.

The department allows its majors to concentrate in a number of interdisciplinary areas, and we welcome double-majors in philosophy and another field. Please consult the department's undergraduate adviser to work out a suitable program.

## Minor in Philosophy

The minor in philosophy affords students the benefits, both personal and professional, of studying philosophy.

A student minoring in philosophy must earn a C or better in six philosophy courses, including four at the 3000-level or higher.

## Minor in Ethics

Ethical questions and problems arise in all aspects of life. A minor in ethics can complement and enrich any major field of study.

The minor in ethics consists of six courses, four at the 3000 level or above. A student takes one course in each of these areas: ethical theory; applications; scientific, historical and social analysis, and capstone course. The other two courses are approved electives.

## Minor in Environmental Values

The minor in Environmental Values may be added to any bachelor's program at UW. This minor creates a vital link among the natural sciences, humanities, and social sciences through exploration of aesthetics, culture, ethics, and policy.

The minor requires a total of 18 credit hours, including at least one course within each of four areas of concentration. At least 12 of these credits must be outside the primary major, and nine of these credits must be at or above the 3000-level. A three-hour, core course (either PHIL 2330 Environmental Ethics or PHIL 2340 Natural Resource Ethics) is required of all students.

## Graduate Study

The Department of Philosophy offers the master of arts degree under the Plan A

### Program Specific Admission Requirements

A writing sample of no more than 3,000 words on any subject in philosophy.

A statement describing specific philosophical interests.

### Program Specific Graduate Assistantships

The department offers two to three graduate assistantships yearly on a competitive basis. These assistantships carry a tuition and fee waiver, plus a stipend. For more information, please contact the department.

## Program Specific Degree Requirements

### Plan A (thesis)

31 hours of graduate credit  
27 hours of graduate coursework  
4 hours of thesis research

Proof of proficiency in formal logic (through first-order predicate logic with identity) by either passing the department's course (3420) or some other course judged to be its equivalent with a grade B or better or by completing a test with a grade B or better at the end of the second semester.

First year paper at the beginning of the third semester.

Defense of a thesis prospectus by the end of the third semester.

In any cases of deficiency, the department may require remedial work before admission to M.A. candidacy.

## Philosophy (PHIL)

*Philosophy majors may not take any philosophy course for S/U credit without written permission from the department head.*

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).**

**1000. Introduction to Philosophy. 3. [CH◀▶H]** Introduces critical thinking through a study of elementary logic, scientific method and philosophical problems of ethics, religion, epistemology and metaphysics.

**2100. The Greek Mind. 3. [CH◀▶(none)]** Part one of the history of philosophy sequence. The first great age of philosophy was in ancient Greece. Students read from ancient Greek poets, historians and medical writers, as well as philosophers. The course attempts to understand the Greek mind: what Greeks thought of persons, society and the universe. *Prerequisite:* 3 hours of philosophy.

**2200. Social and Political Philosophy. 3.** Critically or historically examines philosophical issues arising from the study of society and state. Topics may include the existence and nature of rights; the relation between law and morality; the obligation of citizens to their society; the nature of a just society; and theories of reward and punishment.

**2300. Ethics in Practice. 1-3 (Max. 6). [CH◀▶(none)]** Alerts preprofessional students and other interested individuals to various ethical issues they will encounter and relevant professional work on those issues. Emphasis of the course concentrates one time on bio-

medical ethics, another on technology and engineering ethics, another on ethics in the professions.

**2310. Philosophy of Religion. 3. [CH◀▶(none)]** Systematically examines philosophical questions, arguments and theories arising from study of religion. Topics may include: reason and religion; the existence and nature of God; the character of religious language; and attempts to determine the authenticity of religious experience. *Prerequisite:* 3 hours of philosophy.

**2330. Environmental Ethics. 3. [CH◀▶(none)]** Introduction to ethical theory in environmental problem cases, and to philosophical issues in environmental philosophy. Ethical theories include natural law, utilitarianism, deontological and rights-based theories, relativism. Topics may include: conservation/preservation, resource management, pollution, overpopulation, factory farming, Leopold's land ethic, deep ecology, holism, eco-feminism. Cross listed with ENR 2330.

**2345. Natural Resource Ethics. 3. [CH,D◀▶H]** Introduction to ethics in context of natural resource extraction, use, conservation, preservation, and distribution. Ethical frameworks include teleological and deontological theories primarily applied to human needs and wants. Concepts and applications of environmental justice are addressed, including private property, sustainability, and obligations to future generations. Cross listed with ENR/RNEW 2345.

**2420 [1100]. Critical Thinking. 3. [CH◀▶(none)]** Shows that argument is a skill of fundamental importance to any field of endeavor. Explains methods used in evaluating an argument. Introduces such topics as: patterns of reasoning, counterexamples, fallacies; inductive and deductive logic.

**3000. Special Topics. 3 (Max. 9).** Provides undergraduates with the opportunity for in-depth discussion of seminal works in the history of philosophy or a problem in contemporary philosophy not offered in regular courses or independent study. Open to interested undergraduates from all majors. *Prerequisite:* 3 hours of philosophy.

**3100. History of Modern Philosophy: The Rationalists. 3.** The second great age of philosophy absorbed the influence of the new science during the 17th and 18th centuries. People to be studied include: Descartes, Spinoza and Leibniz. *Prerequisite:* 3 hours of philosophy.

**3110. History of Modern Philosophy: The Empiricists. 3.** People to be studied include: Locke, Berkeley, Hume and Kant. These

philosophers are included in the second great age of philosophy. *Prerequisite:* 3 hours of philosophy.

**3120. Ancient Greek Philosophy. 3.** Surveying some of ancient Greek philosophy. Begins with the works of the earliest extant philosophical thinkers, the presocratics. Remainder of focus on Plato and Aristotle. *Prerequisite:* 3 hours of philosophy.

**3140. Philosophy of Science. 3.** Systematically examines philosophical problems about the nature of science, its methods of explanation, and the status of its laws and theories. *Prerequisite:* 6 hours of physical, biological or social science.

**3220. Existentialism and Phenomenology. 3.** Examines fundamental perspectives of existentialist thought, beginning with its roots in Kierkegaard and Nietzsche. Looks at a large variety of existentialist perspectives presented by Sartre, Heidegger, Buber, Jaspers and Camus. Considers the relation of Husserl's phenomenological method to existentialism. *Prerequisite:* 3 hours of philosophy.

**3250. Global Justice. 3. [G◀(none)]** An examination of global justice, normative international relations, and international ethics, using the methodology and theories of analytical political philosophy. Possible topics include global economic justice and world poverty, human rights, humanitarian duties, intervention and sovereignty, cosmopolitanism, nationalism, patriotism, world hunger, and immigration. *Prerequisite:* 3 hours of philosophy or international studies.

**3300. Ethical Theory. 3.** A philosophical investigation of such concepts as morality, obligation, goodness, freedom and responsibility, and of recurring types of ethical theory. *Prerequisite:* 3 hours of philosophy.

**3320. Eastern Thought. 3.** Surveys some of the major concepts in Zen, Hinduism, Buddhism, Taoism and Confucianism. Cross listed with RELI 3320. *Prerequisite:* 3 hours of philosophy.

**3340 [2340]. Philosophy in Literature. 3 (Max 6).** Examines central themes in literary works with philosophical significance; studies related general issues. Authors studied may include Aristotle, Dostoyevski, Kafka, ee cummings, Grass, Mann, Pound, Rilke, Camus, and Sartre. Issues include questions of interpretation, criticism, and translation, as well as the possibility of direct philosophical influence on authors. Cross listed with ENGL 3340. *Prerequisites:* one course in philosophy and one course in literature or criticism in the English department.

**3350. History of Moral Philosophy. 3.** A historical and philosophical overview of ethical theory ranging from ancient Greek ethics to the present. *Prerequisite:* 3 hours of philosophy.

**3420. Symbolic Logic. 3.** Studies both propositional and quantificational logic, concentrating on methods of proof. Takes up such topics as identity, singular terms, intuitive set theory, and translating English sentences into symbolic notation. *Prerequisites:* 3 hours of philosophy

**3440. Philosophy of Mind. 3.** Considers topics in philosophy of mind, including the mind-body problem, emotions, attitudes, perception and psychological explanation. *Prerequisite:* 3 hours of philosophy.

**3500. History of Science. 3.** Historic and philosophic survey of the development of science from the ancient Greeks to the 20th century. *Prerequisites:* 3 hours of laboratory science and 3 hours of philosophy.

**3510. Introduction to Epistemology. 3.** Systematic introduction to epistemology, the philosophical study of knowledge and justified belief. Aims to answer questions such as: What are the necessary and sufficient conditions of knowledge? What are its sources? What is its structure, and what are its limits? How we are to understand the concept of justification? *Prerequisite:* 3 hours of philosophy.

**3560. Introduction to Metaphysics. 3.** A systematic introduction to metaphysics, the branch of philosophy concerned with providing a comprehensive account of the most general features of reality as a whole. Of central importance is the study of ontology, which seeks to address the question of what general sorts of things exist: particulars, universals, propositions, numbers, minds. *Prerequisite:* 3 hours of philosophy.

**4000. Philosophical Issues. 1-3 (Max. 6).** Dual listed with PHIL 5000. *Prerequisite:* consent of instructor.

**4020. Plato. 3.** Detailed examination of selected dialogues of Plato. Dual listed with PHIL 5020. *Prerequisite:* 12 hours of philosophy including PHIL 2100.

**4030. Aristotle. 3.** Detailed examination of selected works of Aristotle. Dual listed with PHIL 5030. *Prerequisite:* 12 hours of philosophy including PHIL 2100.

**4040. Kant. 3.** An examination of one or more aspects of the work of Immanuel Kant, conducted either from the perspective of the history of philosophy, or predominantly as a critical study. Dual listed with PHIL 5040. *Prerequisite:* 12 hours of philosophy including PHIL 3100.

**4110. Figures in Contemporary Philosophy. 3-6 (Max. 6).** An advanced study of the work of one, or several related, contemporary philosophers. Dual listed with PHIL 5110. *Prerequisite:* 12 hours of philosophy including PHIL 3100.

**4120 [4100]. Philosophy and the 20th Century. 3.** Part three of the history of philosophy sequence. Covers the third great age of philosophy. Studies the main ways in which philosophy has been done since 1900. Topics normally include logic and philosophy, Wittgenstein, logical positivism and current trends. Dual listed with PHIL 5120. *Prerequisites:* PHIL 4120/5120, PHIL 4120; 12 hours of philosophy including either PHIL 2100 or 3100.

**4140. Topics in Philosophy of Science. 3 (Max. 6).** Encompasses selected topics in philosophy of science. Dual listed with PHIL 5140. *Prerequisite:* 12 hours of philosophy including PHIL 3140; PHIL 2220 is recommended.

**4190. Philosophy of Language. 3-6 (Max. 6).** An advanced study of the work of one, or several related, contemporary philosophers. Dual listed with PHIL 5190. *Prerequisite:* 12 hours of philosophy including PHIL 4510 or 4560.

**4300. Topics in Ethics. 3-6 (Max. 6).** An advanced investigation of selected topics in ethics. Examples include derivative and basic principles of obligation; justice; morality and utility; generalization of norms; and the relation of morality and law. Dual listed with PHIL 5300. *Prerequisite:* 12 hours of philosophy including PHIL 3300 or 3350.

**4340. Issues in Environmental Ethics. 3.** Encompasses selected topics in environmental and natural resource ethics. Cross listed with RNEW 4340. Dual listed with PHIL 5340. *Prerequisites:* PHIL 2330, 2345, 3300 or 3350.

**4420. Advanced Logic. 3.** Studies advanced topics in mathematical logic. Takes up such topics as: uninterpreted calculi and the distinctive contributions of syntax and semantics; metatheory, including completeness and consistency proofs; modal logic and semantics; logic as a philosophical tool. Dual listed with PHIL 5420; cross listed with COSC/MATH 4420. *Prerequisite:* PHIL 3420 or equivalent.

**4440. Topics in Philosophy of the Mind. 3-6 (Max. 6).** An advanced study of problems in the philosophy of mind such as the concept of human action; intention, choice, reasons and causes in the explanation of human action, mental states and brain states, and artificial intelligence. Dual listed with PHIL 5440. *Prerequisite:* 12 hours of philosophy including PHIL 3440.

**4510. Theory of Knowledge. 3.** Studies such problems as knowledge and belief, skepticism, perception and knowledge, memory, truth and justification of induction. Dual listed with PHIL 5510. *Prerequisite:* 12 hours of philosophy including PHIL 3100 and 4100.

**4560. Metaphysics. 3.** Examines approaches to metaphysics. Discusses problems such as causality, individuation and the distinction between particulars and universals. Dual listed with PHIL 5560. *Prerequisites:* 12 hours of philosophy including PHIL 3100 and 4100.

**5000. Philosophical Issues. 1-3 (Max. 6).** Dual listed with PHIL 4000. *Prerequisites:* graduate status and consent of instructor.

**5020. Plato. 3.** Detailed examination of selected dialogues of Plato. Dual listed with PHIL 4020. *Prerequisite:* graduate standing.

**5030. Aristotle. 3.** Detailed examination of selected works of Aristotle. Dual listed with PHIL 4030. *Prerequisite:* graduate standing.

**5040. Kant. 3.** An examination of one or more aspects of the work of Immanuel Kant, conducted either from the perspective of the history of philosophy, or predominantly as a critical study. Dual listed with PHIL 4040. *Prerequisite:* graduate standing.

**5100. Figures in Modern and 19th Century Philosophy. 3-6 (Max. 6).** A detailed examination of one or more of the figures in modern or 19th century philosophy. *Prerequisite:* 12 hours of philosophy including PHIL 3100.

**5110. Figures in Contemporary Philosophy. 3-6 (Max. 6).** An advanced study of the work of one, or several related, contemporary philosophers. Dual listed with PHIL 4110. *Prerequisite:* 12 hours of philosophy including PHIL 3100.

**5120. Philosophy and the Twentieth Century. 3.** Part three of the history of philosophy sequence. Covers the third great age of philosophy. Studies the main ways in which philosophy has been done since 1900. Topics normally include logic and philosophy, Wittgenstein, logical positivism and current trends. Dual listed with PHIL 4120. *Prerequisite:* graduate standing.

**5140. Topics in Philosophy of Science. 3-6 (Max. 6).** Encompasses selected topics in philosophy of science. Dual listed with PHIL 4140. *Prerequisite:* 12 hours of Philosophy including PHIL 3140.

**5190. Philosophy of Language. 3-6 (Max. 6).** An advanced study of the work of one, or several related, contemporary philosophers. Dual listed with PHIL 4190. *Prerequisite:* 12 hours of philosophy including PHIL 4510 or 4560.

**5200. Topics in Contemporary Philosophy. 3-6 (Max. 6).** An advanced investigation of topics of current importance in philosophy not dealt with in other advanced courses. Examples include: truth, nature of conceptual schemes and world views, and nature of philosophical problems and arguments. *Prerequisite:* 12 hours of philosophy including PHIL 1000 and consent of instructor.

**5300. Topics in Ethics. 3-6 (Max. 6).** An advanced investigation of selected topics in ethics. Examples include derivative and basic principles of obligation; justice; morality and utility; generalization of norms; and the relation of morality and law. Dual listed with PHIL 4300. *Prerequisite:* graduate standing.

**5340. Issues in Environmental Ethics. 3.** Encompasses selected topics in environmental and natural resource ethics. Dual listed with PHIL 4340. *Prerequisite:* PHIL 2330, 2345, 3300 or 3350.

**5420. Advanced Logic. 3.** Studies advanced topics in mathematical logic. Takes up such topics as: uninterpreted calculi and the distinctive contributions of syntax and semantics; metatheory, including completeness and consistency proofs; modal logic and semantics; logic as a philosophical tool. Dual listed with PHIL 4420; cross listed with COSC/MATH 5420. *Prerequisite:* PHIL 3420 or equivalent; graduate standing.

**5440. Topics in the Philosophy Of Mind. 3-6 (Max. 6).** An advanced study of problems in the philosophy of mind such as the concept of human action; intention; choice; reasons and causes in the explanation of human action; mental states and brain states; and artificial intelligence. Dual listed with PHIL 4440. *Prerequisite:* 12 hours of philosophy including PHIL 3440.

**5510. Theory of Knowledge. 3.** Studies such problems as knowledge and belief, skepticism, perception and knowledge, memory, truth and justification of induction. Dual listed with PHIL 4510. *Prerequisites:* 12 hours of philosophy including PHIL 3100 and 4100.

**5550. Independent Study. 1-6 (Max. 6).** A study of a topic selected in consultation with the instructor. *Prerequisite:* 12 hours of philosophy and consent of instructor.

**5560. Metaphysics. 3.** Examines approaches to metaphysics. Discusses problems such as causality, individuation and distinction between particulars and universals. Dual listed with PHIL 4560. *Prerequisites:* graduate standing.

**5890. Problems in Philosophy. 1-10 (Max. 10).** A study of specific topics to be selected in consultation with the instructor. *Prerequisite:* 15 hours of philosophy and consent of instructor.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes. *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Physics and Astronomy

204 Physical Sciences Building, 766-6150

FAX: (307) 766-2652

Web site: [www.uwyo.edu/physics](http://www.uwyo.edu/physics)

Department Head: Daniel A. Dale

### Professors:

**MICHAEL S. BROTHERTON**, B.S. Rice University 1990; M.A. University of Texas at Austin 1992; Ph.D. 1996; Professor of Physics and Astronomy 2014, 2002.

**YURI DAHNOVSKY**, Institute of Chemical Physics, Moscow 1983; Professor of Physics 2007, 2000.

**DANIEL A. DALE**, B.S. University of Minnesota 1993; M.S. Cornell University 1996; Ph.D. 1998; Professor of Physics and Astronomy 2009, 2001.

**PAULE. JOHNSON**, B.S. Davidson College 1973; M.S. University of Washington 1977; Ph.D. 1979; Head of the Department of Physics and Astronomy 1997; Professor of Physics and Astronomy 1993, 1981.

**HENRY A. KOBULNICKY**, B.S. University of Iowa 1991; M.S. University of Minnesota 1993; Ph.D. 1997; Professor of Physics and Astronomy 2014, 2002.

**JINKE TANG**, B.S. Jilin University 1982; M.S. Iowa State University 1990; Ph.D. 1989; Professor of Physics 2007.

**Associate Professors:**

**MICHAEL J. PIERCE**, B.S. University of Oklahoma 1980; M.A. University of Hawaii 1983; Ph.D. 1988; Associate Professor of Physics and Astronomy 2005, 2001.

**WENYONG WANG**, B.S. Nankai University 1993; M.S. Yale University 1999; Ph.D. 2004; Associate Professor of Physics 2014, 2008.

**Assistant Professors:**

**TEYU CHIEN**, B.S. National Taiwan Normal University 2001; Ph.D. University of Tennessee-Knoxville 2009; Assistant Professor of Physics 2013.

**HANNAH JANG-CONDELL**, S.B. Massachusetts Institute of Technology 1999; A.M. Harvard University 1999; Ph.D. 2004; Assistant Professor of Physics and Astronomy 2011.

**ADAM D. MYERS**, M.S. Durham University, United Kingdom 2000; Ph.D. 2004; Assistant Professor of Physics and Astronomy 2011.

**Academic Professional Lecturers:**

**RÜDIGER MICHALAK**, Dipl. Phys FZ Julich 1989; Ph.D. 1993; Academic Professional Lecturer in Physics and Astronomy 2007, 2004.

**DAVID R. THAYER**, B.S. University of Miami 1977; Ph.D. Massachusetts Institute of Technology 1983; Academic Professional Lecturer in Physics 2002.

**Assistant Lecturer:**

**EDWARD KONCEL**, B.S. Portland State University 1969; M.S. University of Wyoming 1988; Ed.D. 1992; Assistant Lecturer in Physics and Astronomy 1999.

**JIMMIE VERLEY**, B.S. Colorado State University 1967; B.S. University of Wyoming 1980; Ph.D. 2008; Assistant Lecturer in Physics 2014.

**Adjunct Professors:**

Allam, Bianchini, Kuttyrev, Marquard, Norris, Shang, Slater, Wang

**Professors Emeriti:**

Ronald W. Canterna, Walter T. Grandy, A. Raymond Kunselman, Terry P. Roark, James M. Rosen

Physics originated in antiquity as the study of natural philosophy. As such, it attempts to describe the universe within the context of both physical laws and the fundamental particles of nature. The broad scope of physics runs from the microscopic nuclear structure and that of the elementary particles themselves to the macroscopic, the galaxy and evolution of the universe as a whole. Today the subject is generally divided into broad areas such as solid-state, nuclear, elementary particles, astrophysics, etc. The department maintains competence in most major branches of physics

and offers instruction in these areas at both the undergraduate and graduate levels. In addition, it has a strong interest and involvement in science education.

**Undergraduate Curriculum**

The four-year physics programs are the Bachelor of Arts in physics, Bachelor of Science in physics, and the Bachelor of Science in physics plus. The Bachelor of Science programs are intended for students who will pursue a career or a graduate degree in the field, whereas the Bachelor of Arts program is primarily geared toward those who are interested in pursuing physics as a second major. The department also offers a Bachelor of Science degree in Astronomy and Astrophysics.

**Bachelor of Science Major Program**

Students in the Bachelor of Science in Physics major program are required to complete the following courses:

- PHYS 1210 or 1310, 1220 or 1320, 2310, 2320, 3640, 3650, 4210, 4310, 4410, 4420, 4510, and 4840;
- Students are required to take at least 3 hours of electives from any PHYS 4000- or 5000-level course
- MATH 2200, 2205, 2210, 2250, 2310, 4230, and 4440
- COSC 1010 and CHEM 1020

**Bachelor of Arts Major Program**

Students in the Bachelor of Arts in physics major program are required to complete the following courses:

- PHYS 1210 or 1310, 1220 or 1320, 2310, 2320, 3650, 4210, 4310, 4410, 4510
- Students are required to take at least 3 hours of electives from any PHYS 4000- or 5000-level course.
- MATH 2200, 2205, 2210, 2310
- COSC 1010 and CHEM 1020

**Physics Plus Curriculum**

Students preparing for strictly technological careers and hence want heavily technological undergraduate educations, may select the physics plus curriculum. This program enables students to concentrate in physics, mathematics and an elected technical area with some sacrifice in the breadth of general education.

Students in the Physics Plus program are required to complete the following courses:

- PHYS 1210 or 1310, 1220 or 1320, 2310, 2320, 3650, 4210, 4310, 4410, 4510, 4840, 4860

- MATH 2200, 2205, 2210, 2250, and 2310
- PHYS 4830 or both MATH 4230 and 4440
- COSC 1010 and CHEM 1020
- A coherent program of 27 credits in a technical area approved by the department head

Examples of an elected technical area could be an area involving additional physics and mathematics; physics, mathematics, and astronomy; engineering; biological sciences; chemistry; computer science; mathematics; geophysics; atmospheric science; economics; business; education or technical writing. Further details are available from the department's web site.

**Minor Program**

- Complete PHYS 1210 or 1310
- Complete PHYS 1220 or 1320
- PHYS 2310 and 2320
- At least two of the following: PHYS 4210, 4310, 4410, 4510

**Astronomy Major Program**

Students in the Bachelor of Science in Astronomy major program are required to complete the following courses:

- ASTR 2310, 2320, 4610 PHYS 1210 or 1310, 1220 or 1320, 2310, 2320, 3640, 3650, 4210, 4310, 4410, 4420, 4510, and 4840
- MATH 2200, 2205, 2210, 2250, and 2310
- COSC 1010

**Astronomy Minor Program**

- Complete PHYS 1210 or 1310
- Complete PHYS 1220 or 1320
- PHYS 2310 and 2320
- ASTR 2310 and 2320

**Graduate Study**

The Department of Physics and Astronomy offers the degrees of master of science in physics, master of science in teaching, and doctor of philosophy. Advanced degrees in physics may be based on experimental or theoretical research in physics or astrophysics.

Please refer to the departmental homepage at <http://www.uwyo.edu/physics/> for the programmatic updates, or contact the department directly.

## Program Specific Admission Requirements

Applicants for graduate study in physics or astrophysics should have an undergraduate preparation in physics and mathematics equivalent to that specified for a physics major. They must submit their scores for the verbal aptitude, the quantitative aptitude, analytical aptitude, and the advanced physics portion of the GRE.

## Program Specific Graduate Assistantships

The Physics and Astronomy Department commits to providing first- and second-year students with teaching assistantships for the nine-month academic year. More advanced students are generally supported on federal grants or fellowships. Both teaching and research assistantships carry a full tuition waiver and insurance. Summer assistantships are often available to students making satisfactory progress. Refer to <http://www.uwyo.edu/physics/> for current amounts.

## Program Specific Degree Requirements

### Master of Science in Physics

#### Plan A (thesis)

- 26 hours of graduate coursework, 20 of which must be in PHYS/ASTR at the 5000-level
- 4 hours of PHYS 5960

#### Plan B (non-thesis)

- 30 hours of graduate coursework, 24 of which must be in PHYS/ASTR at the 5000-level

Thesis planning, development, and production guided by the committee chair and graduate committee.

### Master of Science in Teaching

#### Plan A (thesis)

- 18 hours from PHYS/ASTR at the 5000-level
- 12 hours from PSYC or the College of Education at the 4000- or 5000-level

Thesis planning, development, and production guided by the committee chair and graduate committee.

The Master of Science in Physics with emphasis in teaching is designed for graduate students preparing to teach in secondary schools or in community colleges. It will include a small, carefully designed component in psychology and education, and includes a

supervised teaching experience. This program will require a thesis project based on experience in the classroom.

### Doctoral Program

42 hours of graduate coursework

30 hours of PHYS 5980 or 5860. Dissertation planning, development, and production guided by the committee chair and graduate committee.

During the first two years, students normally take physics and astronomy courses while working with faculty members on one or more research projects. Students participate in weekly research seminars and journal clubs to learn about a broad range of current research. By the third year, Ph.D. students begin research work in the area of their dissertation.

Course work consists of several required courses plus a number of elective courses. Astronomy track students will take the required astronomy courses plus electives. Physics track students will take the required physics courses plus electives.

#### Physics required courses:

- PHYS 5310 Quantum Theory I
- PHYS 5410 Electromagnetic Theory I
- PHYS 5510 Statistical Mechanics I
- PHYS 5720 Advanced Solid State
- PHYS 5750 Optical Properties of Solids
- PHYS 5730 Condensed Matter Magnetism
- PHYS 5740 Transport Properties of Solids

#### Physics elective courses:

- PHYS 5110 & 5120 Methods of Theoretical Physics I & II
- PHYS 5210 & 5120 Classical Mechanics I & II
- PHYS 5320 Quantum Theory II
- PHYS 5550 Advanced Statistical Mechanics
- PHYS 5770 Nanotechnology: Nanophysics & Nanosystems
- PHYS 5780 Modern Computational Methods in Solids
- PHYS 5820 Plasmas Physics
- PHYS 5830 Physics of Solar Cells
- PHYS 5840 Experimental Methods and Low Temperature

#### Astronomy required courses:

- ASTR 5150 Astronomical Techniques
- ASTR 5420 Stellar Structure and Evolution
- ASTR 5460 Cosmology
- ASTR 5470 Interstellar Medium and Diffuse Matter
- ASTR 5465 Galaxies

## Two of the following physics courses must be taken:

- PHYS 5310 Quantum Theory I
- PHYS 5410 Electromagnetic Theory I
- PHYS 5510 Statistical Mechanics I

## Elective courses:

- ASTR 5160 Data Mining in Large Astronomical Surveys
- ASTR 5430 Radiative Processes & Stellar Atmospheres
- ASTR 5440 Stars and Milky Way
- ASTR 5480 Planetary Astronomy
- ASTR 5490 Planets and Their Stars
- ASTR 5870 Special Topics in Astrophysics

Ph.D. candidates demonstrate their competency in basic undergraduate physics and in required graduate courses through a written examination. After passing the written exam, students will take an oral preliminary exam based on a research project they have completed during the first two years. At the completion of the Ph.D. dissertation, a candidate makes a public presentation of his or her work and the committee conducts a final examination to award the degree.

## Astronomy (ASTR)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**1000. Descriptive Astronomy. 3.** Covers essential features of the solar system, stellar astronomy and time measurement. Students who have taken ASTR 2310 may not earn credit in ASTR 1000, and not more than 4 credit hours may be earned by taking both ASTR 1000 and 1050.

**1050. Survey of Astronomy. 4. [SE♦PN]** Consists of 3 lecture periods and a two-hour laboratory in observational and laboratory astronomy. Observing sessions are scheduled after dark and held when weather permits. Designed primarily for non-science majors. Students who have taken ASTR 2310 may not earn credit in ASTR 1050. *Prerequisite:* MATH 1000 or passing mathematics proficiency exam at Level 3.

**1070. The Earth: Its Physical Environment. 4. [SE♦PN]** Discusses selected topics from geology, astronomy and meteorology illustrating fundamental concepts, processes, products and the interrelationships among them. Emphasizes nature of science and relationship between selected topics and society. Cross listed with GEOL 1070. *Prerequisites:* Math Level 3 or equivalent courses; consent of instructor; enrollment reserved for elementary education majors; EDCI 2000 must be selected concurrently.

**2310. General Astronomy I. 4.** Covers the history of astronomy, orbital mechanics, solar system (the Sun, planetary interiors, atmospheres, moons, comets, meteors); interaction of radiation and matter (physical processes in gas, black body radiation) astronomical instrumentation and detectors. Laboratory includes exercises in observational astronomy. Observing sessions are scheduled after dark and held when weather permits. *Prerequisites:* PHYS 1210 or 1310, MATH 2200. (Normally offered spring semester)

**2320. General Astronomy II. 4.** Covers the properties of stars, stellar atmospheres and stellar evolution, interstellar matter, galaxies and cosmology including models of the universe, the Big Bang, and dark energy. Laboratory includes exercises in observational astronomy. Observing sessions are scheduled after dark and held when weather permits. *Prerequisites:* PHYS 1210 or 1310, MATH 2200.

**4000. Astronomy for Teachers. 1-5 (Max. 5).** Specifically designed for elementary school teachers. Presents basic concepts (time, seasons, light and its properties); planetary systems of the sun; the sun and stars; the Milky Way and galaxies; and cosmology and relativity. Emphasizes presenting these concepts to elementary school children. Half the class is devoted to laboratory and workshop activities to develop techniques for presenting these concepts through visual aides, demonstrations and films. Students may receive a maximum of 5 credits in a combination of ASTR 4000 and 4100. *Prerequisites:* 6 hours of physical or biological science, junior standing in education. (Offered summer session)

**4100. Astrophysics for Secondary Teachers. 1-3 (Max. 3).** Discusses modern physics, emphasizing obtaining and analyzing real data. Adaptable to junior and senior high school science classrooms. Special projects include analysis of planetary positions and images; direct observations of the sun; predictions of eclipses and tides; analyses of basic astronomical data of stars, star clusters, galaxies and clusters of galaxies; and cosmological modeling. Students may receive a maximum of 5 credits in a combination of ASTR 4000 and 4100. *Prerequisite:* junior standing in secondary science education. (Offered summer session)

**4610. Introduction to Astrophysics. 3.** Includes astrophysical sources of radiation, radiation transport, nonequilibrium processes, stellar atmospheres, stellar interiors and the interstellar medium. *Prerequisites:* ASTR 2310, PHYS 2310 and concurrent registration in PHYS 4210 and 4410. (Normally offered fall semester)

**4620. Modern Research in Astrophysics. 3.** Taught jointly by astrophysics faculty and others. Includes several topics of current research in astrophysics. *Prerequisite:* ASTR 4610.

**4860. Problems in \_\_\_\_\_. 1-4 (Max. 12).** Independent, in-depth study of selected problems in astronomy and astrophysics. Entirely laboratory-oriented investigations of astronomical objects. *Prerequisites:* ASTR 2310 and PHYS 2310.

**4870. Special Topics in \_\_\_\_\_. 1-4 (Max. 12).** Presents various subjects not normally available in regularly advertised curriculum. *Prerequisite:* ASTR 2310.

**5150. Astronomical Techniques. 4.** Discusses selected topics in observational astronomy such as applications of the Fourier transform, design of optical instruments, properties of various detectors of electromagnetic radiation, sources of uncertainty in astronomical data, reduction techniques for these data, and techniques of image processing. *Prerequisite:* graduate standing in astrophysics.

**5160. Data Mining in Large Astronomical Surveys. 4.** Aimed at an understanding of how to manipulate and analyze catalog-level data from large astronomical surveys. Students will address realistic problems in data mining large astronomical surveys using one or more programming languages. *Prerequisites:* graduate standing.

**5420. Stellar Evolution and Structure. 4.** The life cycle of stars forms the basis for this course, including formation and early evolution, hydrostatic structure, and late stages of evolution. In addition, energy generation and transport are presented. *Prerequisite:* graduate standing in astrophysics.

**5430. Radiative Processes and Stellar Atmospheres. 4.** Presents detailed descriptions of radiative transfer mechanisms, both in thermal and nonthermal sources, and the relevant techniques of observation. LTE and non-LTE models are discussed. *Prerequisite:* ASTR 5420.

**5440. Stars and the Milky Way. 4.** Spatial distribution of stars within our galaxy; photometric/ spectroscopic/ astronomic/ kinematic properties of major classes of stars; structure and dynamics of the observational determination of structure; stellar populations; and the chemical and structural evolution. *Prerequisite:* graduate standing in astrophysics.

**5460. Galactic Structure and Evolution: Cosmology. 4.** Presents material describing current cosmological models and their application to areas of extragalactic astronomy. Topics include cosmic dynamics, introduction to relativistic models, measuring parameters, dark matter, dark energy, the cosmic micro-

wave background radiation, big bang nucleosynthesis. *Prerequisite:* Graduate standing in astrophysics.

**5465. Galaxies. 4.** Presents material necessary for study of the Milky Way, galaxies, active galaxies, and the large-scale structure of the universe. Topics include stellar populations, kinematics and dynamics in the Milky Way and other galaxies, galaxy classification and properties, and active nuclei and quasars. *Prerequisite:* graduate standing in astrophysics.

**5470. Interstellar Medium and Diffuse Matter. 4.** The material between stars is the primary topic, including the chemistry, energetics, and evolution of interstellar matter. The formation of molecules and dust grains, and their composition, are also discussed. Emission processes characteristic of the ISM are described. *Prerequisite:* ASTR 5460.

**5480. Planetary Astronomy. 4.** Studies to include, but not limited to, area in solar nebula evolution, planetary formation and evolution, planetary surfaces, and planetary atmospheres. *Prerequisite:* graduate standing in astrophysics.

**5490. Planets and Their Stars. 4.** Reviews recent and current research in planets and exoplanets. Topics may include planet formation, known properties of exoplanets, comparisons to Solar System planets, properties of planet-hosting stars, and evolution of planetary systems. *Prerequisites:* graduate standing or permission of the instructor.

**5630. General Relativity and Cosmology I. 3.** Presents a detailed study of Einstein's theory of the gravitational field with emphasis on the geometric structure of space-time, and selected topics in general relativity. *Prerequisite:* PHYS 5320, 5420.

**5860. Independent Study. 1-4 (Max. 8).** Investigations on the level of original graduate research in astrophysics. Research projects emphasized are primarily in infrared astrophysics. *Prerequisite:* ASTR 4860 or equivalent.

**5870. Special Topics in Astronomy. 1-4 (Max. 20).** *Prerequisite:* graduate standing

**5960. Thesis Research. 1-12 (Max. 12).** Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrollment in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 12).** Graduate level course designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate degree program.



## Physics (PHYS)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◆PN]).

### 1050. Concepts of Physics. 4. [SP◆PN]

Introduces the physical world. For students whose background in math and science is minimal; recommended for students in paramedical sciences and medical technology. Three lecture hours per week are supplemented by two hours per week of laboratory work. *Prerequisite:* MATH 1000 or passing the Mathematics Placement Examination at Level 3. (Normally offered both semesters)

### 1090. The Fundamentals of the Physical Universe. 4. [SP◆PN]

Applies fundamental principles of chemistry and physics to real life situations. Primarily for elementary education majors. *Prerequisites:* Math Level 3 or MATH 1000 and major in elementary education. (Normally offered fall, spring and summer)

### 1101. First-Year Seminar. 3. [(none)◆FYS]

### 1110. General Physics I. 4. [SP◆PN]

First course of two-semester sequence. Introduces elementary college physics without calculus. Primarily for premedical, pre dental, preoptometry, prephysical therapy and other students requiring insight into workings of the physical world. Includes classical mechanics, gravitation and heat. Laboratory sessions will illustrate principles studied. Students receiving credit for PHYS 1110 cannot receive credit for PHYS 1050, 1210 or 1310. *Prerequisite:* MATH 1450, 1405 or equivalent. (Normally offered fall and summer semester)

### 1120. General Physics II. 4. [SP◆PN]

Follows PHYS 1110 and completes introduction to physics without calculus. Includes electricity, magnetism, optics and modern physics. Laboratory sessions illustrate principles studied. Students receiving credit in PHYS 1120 cannot receive credit in PHYS 1050, 1220 or 1320. *Prerequisite:* PHYS 1110. (Normally offered spring and summer semester)

### 1210. Engineering Physics I. 4. [SP◆PN]

First course of a two-semester sequence. Provides introduction to physics with calculus for engineering students. Includes classical mechanics, gravitation and mechanical waves. Laboratory sessions illustrate principles studied. Students receiving credit for PHYS 1210 cannot receive credit for PHYS 1050, 1110, or 1310. *Prerequisites:* a grade of C or higher in MATH 2200 and concurrent enrollment in MATH 2205.

### 1220. Engineering Physics II. 4. [SP◆PN]

Follows PHYS 1210 and continues introduction to physics with calculus for engineering students. Includes electricity, magnetism and

heat. Laboratories illustrate principles studied. Students receiving credit for PHYS 1220 cannot receive credit for PHYS 1050, 1120, or 1320. *Prerequisites:* grades of C or higher in MATH 2200, 2205 and concurrent enrollment in MATH 2210.

### 1310. College Physics I. 4. [SP◆(none)]

First course of two semester sequence. Provides thorough introduction to physics with calculus. Primarily for majors in physics, astronomy, and other areas in science, mathematics and technology requiring the highest levels of sophistication. Includes classical mechanics, gravitation and mechanical waves. Laboratory sessions illustrate principles studied and meaning of physical measurement. Students receiving credit for PHYS 1310 cannot receive credit for PHYS 1050, 1110, or 1210. *Prerequisites:* MATH 2200 and concurrent enrollment in MATH 2205.

### 1320. College Physics II. 4. [SP◆(none)]

Follows PHYS 1310 and continues introduction to physics with calculus. Includes electricity, magnetism and thermodynamics. Laboratory sessions illustrate principles studied and meaning of physical measurement. Students receiving credit for PHYS 1320 cannot receive credit for PHYS 1050, 1120 or 1220. *Prerequisites:* MATH 2200, 2205 and concurrent enrollment in MATH 2210.

### 2150. The Physical Principles of Contemporary Social Problems. 3.

Introduces technical basis of several important social problems including pollution, transportation, radiation, nuclear weapons and medical technology. *Prerequisite:* PHYS 1110 or consent of the instructor.

### 2250. Thermodynamic Systems in Energy Science. 4.

Introduces the principles of thermodynamics and their application to energy science. Intended for students majoring in Energy Resource Science. *Prerequisites:* PHYS 1210, grade of C or higher in MATH 2205.

### 2310. Physics III: Waves and Optics. 4.

Third-semester course primarily for majors in physics, astronomy, engineering, mathematics, and other sciences. Includes Gaussian Optics and matrix calculations, wave equations, interference, superposition principle, elementary Fourier Analysis, Fraunhofer and Fresnel Diffraction, application to optical instruments. *Prerequisite:* PHYS 1220 or 1320 or equivalent.

### 2320. Physics IV: Modern Physics. 3.

Fourth semester course primarily for majors in physics, astronomy, engineering, mathematics, and other physical sciences. Topics include introductory quantum mechanics, nuclear and particle physics, lasers, Planck's Blackbody Radiation, photoelectric effect, electron diffraction, wave-particle duality, de-

Broglie Wavelength, Bohr Atom, Heisenberg Uncertainty Principle, Schrodinger Equation, and Einstein's Special Theory of Relativity. *Prerequisite:* PHYS 1220 or 1320 or equivalent.

### 2330. Modern Physics Laboratory. 1.

Provides experimental background needed by physics majors taking lecture course PHYS 2310. Students perform experiments crucial in birth of modern atomic and molecular physics, nuclear physics and solid-state physics. *Prerequisites:* PHYS 1320, MATH 2210, PHYS 2310 concurrently and physics or astronomy major.

### 2870. Special Topics in \_\_\_\_\_. 1-4 (Max. 4).

Presents various subjects not available in regularly scheduled courses. *Prerequisite:* consent of instructor. (Offered based on sufficient demand and resources)

### 3100. Application of Physics in the Modern World. 4.

Presents a broad overview of physics concepts and their application to selected topics of current interest such as atmospheric pollution, nuclear radiation and medicine, and nuclear weapons. *Prerequisite:* 12 hours university-level biological, physical and/or earth sciences.

### 3640. Modern Electronics and Experimental Techniques. 4.

Introduced to analog and digital circuits/devices and computer interfacing with laboratory equipment and experiments. Includes computer programming, the analysis of experimental data, and report writing. Apply the skills developed in this class to interface with and control representative instrumentation used in experimental physics laboratories. *Prerequisites:* PHYS 2320.

### 3650. Advanced Lab in Modern Physics and Electronics. 4. [(none)◆COM3]

Presents fundamentals of modern optics, modern and quantum physics, E&M/electronics, and thermodynamics in a project oriented interactive undergraduate laboratory with a focus on professional grade lab report writing that qualifies as WB USP. Students learn professional data handling, error theory, and data analysis. *Prerequisites:* WA and PHYS 2310 or 2320.

### 4000. Applied Laser Science. 3.

Covers basic operational principles of lasers and their many applications in science and industry. *Prerequisites:* PHYS 2310 or equivalent; PHYS 4310. (Offered based on sufficient demand and resources)

### 4210. Classical Mechanics I. 3.

First semester of a two-course sequence. Presents classical mechanics at intermediate level. Begins with elementary Newtonian mechanics and builds step by step into analytic mechanics. Includes simple harmonic motion of particles in one, two or three dimensions, gravitation; introduction to rigid-body motion; and introduction

to Lagrangian and Hamiltonian Mechanics. *Prerequisites:* PHYS 2310 or equivalent, MATH 2210 or equivalent. (Normally offered spring semester)

**4220. Classical Mechanics II. 4.** Follows PHYS 4210. Presents classical mechanics at an intermediate to advanced level. Includes detailed treatment of Lagrangian and Hamiltonian Mechanics, rigid-body motion, small oscillations and introduction to relativity. Dual listed with PHYS 5220. *Prerequisite:* PHYS 4210.

**4310. Quantum Mechanics. 3.** Studies fundamental concepts of quantum theory. *Prerequisite:* PHYS 4210. (Normally offered fall semester)

**4340. Semiconductor Materials and Devices. 3.** Physical properties of semiconductor materials and devices, including crystal lattices and energy bands, carrier generation, transport, and recombination. PN, metal-semiconductor, and heterojunction operation. Field Effect Transistors, including Metal Oxide Semiconductor (MOSFET), Junction (JFET), METal Semiconductor (MESFET), and High Electron Mobility (HEMT) transistors. Bipolar Junction (BJT) and Heterojunction (HBT) Transistor operation. Cross listed with EE 4340. *Prerequisite:* PHYS 1220 or 1320.

**4350. Advanced Quantum Mechanics. 3.** Covers advanced topics in quantum mechanics, including angular momentum, quantum states in three dimension, hydrogen atomic structure, electron spin, Pauli matrices, time-dependent and independent perturbation methods, Born approximation, formal scattering theory, etc.. *Prerequisites:* PHYS 4210, 4310, 4420 and MATH 4440. (Normally offered spring semester)

**4410. Electricity and Magnetism I. 3.** First semester of a two-course sequence. Presents electricity and magnetism on intermediate level, emphasizing fields. Begins with review of vector algebra and calculus and proceeds to discussion of electrostatics, potential theory and steady currents. *Prerequisites:* PHYS 2310 or equivalent and MATH 2210. (Normally offered fall semester)

**4420. Electricity and Magnetism II. 3.** Follows PHYS 4410 and continues intermediate discussion of electricity and magnetism. Covers magnetostatics, magnetoquasistatics, alternating currents, electromagnetic waves, transmission lines and antennae. *Prerequisite:* PHYS 4410. (Normally offered spring semester)

**4510. Thermodynamics and Statistical Mechanics. 3.** Presents fundamental principles of thermodynamics, emphasizing mathematical development. *Prerequisites:* PHYS 4310 or equivalent and MATH 2210.

**4690. Science: Fact, Fiction and Future. 3. [CH,WC◀(none)]** Examines a number of concepts related to the scientific method. How science “works” is investigated within six topic areas: What is Science?, The Nature of the Scientific Method, Science Fact?, Science Fiction, Science of the Future and Case Studies of the Application of the Scientific Method. *Prerequisites:* completion of at least one lower-division science course and successful completion of a WB course or permission of instructor.

**4710. Solid-State Physics. 3.** Surveys theory and application of solid state physics using quantum theory. Emphasizes relation between theory and experiment. Discusses areas of present research activity. *Prerequisites:* PHYS 4310 and 4510.

**4830. Mathematical and Computational Physics I. 3.** First semester of a two-semester sequence. Provides a comprehensive overview of mathematical physics and numerous analytical mathematical techniques applied to physics problems. Topics include: numerical computations and visualizations, differential and integral vector analysis, linear algebra, infinite series, complex variables, partial differential equations, ordinary differential equations, integral transforms and equations, and calculus of variations. *Prerequisites:* PHYS 2310 or PHYS 2320 and MATH 2210.

**4840. Mathematical and Computational Physics II. 3.** Second semester of a two-semester course. Provides a comprehensive overview of computational physics and provides numerous numerical techniques applied to physics problems. Topics include: numerical computations and visualizations, numerical solutions of ordinary differential equations, linear systems, curve fitting, discrete Fourier transforms, partial differential equations, integration, and Monte Carlo simulations of general stochastic systems. *Prerequisite:* PHYS 4830.

**4860. Independent Study in \_\_\_\_\_. 1-6 (Max. 12).** Encompasses independent study to advanced problems which may involve either library and/or laboratory research. *Prerequisite:* PHYS 2310. (Offered based on sufficient demand and resources)

**4870. Special Topics in \_\_\_\_\_. 1-6 (Max. 12).** Presents various subjects not available in regularly scheduled courses. *Prerequisites:* PHYS 2310 and consent of instructor. (Offered based on sufficient demand and resources)

**4970. Senior Research/Internship. 1-3 (Max. 4).** Requires a practical research experience or internship from the student up to 4 credits under the advisement of a faculty member. This requirement for graduation should

lead to a professional publication or document written by the student. The credit requirements may be spread over several semesters.

**5110. Methods of Theoretical Physics I. 4.** First semester of a two-semester sequence which introduces mathematical techniques used in graduate physics courses. The content may be adjusted to meet the needs of the students. This course is required for M.S. and Ph.D. students. *Prerequisite:* PHYS 4310, PHYS 4410, MATH 4440 or equivalent.

**5120. Methods of Theoretical Physics II. 4.** Designed to follow PHYS 5110 and will introduce further mathematical techniques used in graduate physics courses. Required for M.S. and Ph.D. students. *Prerequisite:* PHYS 5110.

**5210. Classical Mechanics. 4.** Advanced classical dynamics beginning with classical Lagrangian and Hamiltonian formalism, covering relativistic Lagrangian formulation, canonical transformations, Hamilton-Jacobi theory, and small oscillations. A required course for Ph.D. students. *Prerequisite:* PHYS 4220, MATH 4440 or equivalent, and concurrent registration in PHYS 5110.

**5220. Classical Mechanics II. 4.** Presents classical mechanics at an intermediate to advanced level and is designed to follow PHYS 4210. Includes a detailed treatment of Lagrangian and Hamiltonian mechanics. Rigid-body motion, small oscillations, and an introduction to relativity. Dual listed with PHYS 4220. *Prerequisite:* PHYS 4210.

**5230. Advanced Classical Mechanics. 4.** The developments of the 1970s and 1980s, including a major expansion in our understanding of chaotic motion in many areas of science, will be brought together in a coherent framework. A strong computational component will be associated with many of the problems studied. *Prerequisite:* PHYS 4210 and 5220 or equivalent.

**5310. Quantum Theory I. 4.** First semester of a two-semester sequence which presents quantum mechanics on a professional level. Includes topics such as infinite dimensional vector spaces, postulates of quantum mechanics, exactly soluble bound systems, and angular momentum. Required for M.S. and Ph.D. students. *Prerequisite:* PHYS 4220, PHYS 4310, MATH 4440 or equivalent, concurrent registration in PHYS 5110.

**5320. Quantum Theory II. 4.** Designed to follow PHYS 5310 and will present topics such as scattering by a potential, addition of angular momentum, stationary and time dependent perturbation, identical particles. It is required for M.S. and Ph.D. students. *Prerequisite:* PHYS 5310 and concurrent registration in PHYS 5120.

**5410. Electromagnetic Theory I. 4.** The first semester of a two-semester sequence which presents electromagnetic theory on a professional level. The classical analytic solutions of the equations of motion are discussed and expressed as quadratures over the Green functions with attention to effect of boundary conditions. It presents topics such as algebra and calculus of vectors in configuration space, electrostatics, potential theory, and steady currents. Required for M.S. and Ph.D. students. *Prerequisite:* PHYS 4420, PHYS 5110, MATH 4440 or equivalent.

**5420. Electromagnetic Theory II. 4.** Designed to follow PHYS 5410 and will present topics such as magnetostatics, magnetoquasistatics, time dependent electromagnetic theory, physical optics with a vector field, and radiation from antennae. Required for Ph.D. students. *Prerequisite:* PHYS 5410.

**5510. Statistical Mechanics. 4.** An introduction to statistical mechanics and the many-body problem, including quantum statistics. Required for Ph.D. students. *Prerequisite:* PHYS 5210, 5320, 5410.

**5550. Advanced Statistical Mechanics. 3.** A study of modern calculational techniques in the many-body theory of liquids and solids, and an introduction to nonequilibrium processes. *Prerequisite:* PHYS 5520.

**5610. Atomic and Molecular Spectroscopy. 3.** A quantum mechanical treatment of atomic and molecular structure, transition probabilities, selection rules, and the Zeeman and Stark effects. *Prerequisite:* PHYS 5320.

**5720. Advanced Solid State Physics. 3.** A course in modern topics and theoretical technique relevant to condensed matter. *Prerequisite:* PHYS 4710 or equivalent, PHYS 5510.

**5730. Condensed Matter Magnetism. 4.** Designed to give graduate students instruction in the fundamental principles of magnetism, the important properties of magnetic materials and their applications. Required for the physics track of the PhD program. *Prerequisites:* PHYS 4310, 4410, 4510 or equivalent.

**5740. Transport Properties of Solids. 4.** Instruction in the basic quantum theories of electron and phonon transport, interactions among the carriers and with impurities, and important transport phenomena in various systems. Required for the physics track students in the PhD program. *Prerequisites:* PHYS 4310, 4410, 4510 or equivalent.

**5750. Optical Properties of Solids. 4.** Covers advanced topics of optical properties of solids, including free carrier contribution to their optical properties, interband transitions, absorption of light in solids, luminescence and

photoconductivity, electron spectroscopy and surface science, light emitting diodes, etc. *Prerequisites:* PHYS 4310, 4410, 4510 or equivalent.

**5770. Nanotechnology: Nanophysics and Nanosystems. 4.** Introduction to nanoscale fabrication techniques including lithography, pattern transfer, thin film deposition etc. Electronic transport in mesoscopic systems. Electrical properties of nanoscale devices including self-assembled monolayers, carbon nanotubes, and semiconductor nanowires. Noise properties of nanostructures. *Prerequisites:* PHYS 4310 or equivalent.

**5780. Modern Computational Methods in Solids. 4.** Introduces students to a series of physical problems in condensed matter. This course is an extension of introductory condensed matter, with extra degrees of complexity that necessitate numerical techniques and advanced computational approaches to obtain solutions. *Prerequisite:* graduate standing.

**5810. Nuclear and Elementary Particle Physics. 3.** An advanced course in nuclear and elementary particle interactions, with emphasis on current development. *Prerequisite:* PHYS 5350.

**5820. Plasma Physics. 4.** Introduction to plasma physics is exhibited through the analysis of numerous ionized environments (fusion systems, stellar surfaces, and the ionosphere). Fluid approximations (MHD), as well as a kinetic theory formulation (including the Vlasov equation) of plasma physics will be employed. Damping, instabilities, and nonlinear plasmas will be explored. *Prerequisites:* PHYS 4210 and PHYS 4420.

**5830. Physics of Solar Cells. 4.** Covers problems of energy economy, photon physics, physics of semiconductors, conversion of chemical energy into electrical energy, basic structure of solar cells, quantum-dot-semiconductor solar cells, limitations of energy conversions in solar cells, and strategies for higher efficiency. *Prerequisite:* PHYS 5720.

**5840. Experimental Methods and Low Temperature. 4.** Introduction to experimental methods in condensed matter physics and phenomena at low temperatures. The fields of solid properties at low temperatures, the generation and measurement of low temperatures, the generation of high magnetic fields in laboratory magnets, and basic vacuum technology are covered. *Prerequisite:* graduate standing.

**5860. Independent Study. 1-4 (Max. 8).** Designed to provide opportunities for self-study and special projects under supervision of individual professors.

**5870. Special Topics In Physics. 1-4 (Max. 20).** Intended to accommodate various subjects not offered as regular courses. *Prerequisite:* graduate standing.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

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## Political Science

136 Arts and Sciences Building, 766-6484

FAX: (307) 766-6771

Web site: [www.uwyo.edu/pols](http://www.uwyo.edu/pols)

Department Head: Teena Gabrielson

### Professors:

**R. MCGREGGOR CAWLEY**, B.A. Kearney State College 1971; M.A. Colorado State University 1974; Ph.D. 1981; Professor of Political Science 1997, 1987.

**JEAN A. GARRISON**, B.A. University of Wyoming 1990; M.A. University of South Carolina 1992; Ph.D. 1996; Professor of Political Science, 2010, 2001.

**JAMES D. KING**, B.A. Michigan State University 1974; M.A. Western Michigan University 1977; Ph.D. University of Missouri-Columbia 1983; Professor of Political Science 1999, 1992.

**MARGARET M. MURDOCK**, B.A. Creighton University 1970; M.A. Tufts University 1975; Ph.D. 1978; Professor of Political Science 1993, 1975.

**BRENT L. PICKETT**, B.A. Wichita State University 1989; M.A. University of Colorado at Boulder 1991; Ph.D. 1995; Professor of Political Science - Casper 2010, 2005.

**ROBERT A. SCHUHMAN**, B.S. Appalachian State University 1987; M.P.A. 1989; Ph.D. Virginia Polytechnic Institute and State University 1995; Professor of Political Science 2013, 2002, 1995.

**Associate Professors:**

**STEPHANIE B. ANDERSON**, B.S.F.S. Georgetown University 1989; M.Sc. The London School of Economics and Political Science 1990; Ph.D. University of Cambridge 1996; Associate Professor of Political Science 2009, 2005.

**TEENAJ. GABRIELSON**, B.A. Macalester College 1992; M.A. University of California - Davis 1997; Ph.D. 2002; Associate Professor of Political Science 2012.

**ANDREW D. GARNER**, B.S. Kennesaw State University 2002; Ph.D. University of Mississippi 2007; Associate Professor of Political Science 2014, 2008.

**TRACY A. SKOPEK**, B.A. University of Texas 1992; M.P.A. Texas Tech University 1995; Ph.D. 2000; Associate Professor of Political Science 2009, 2003.

**Assistant Professors:**

**NEVIN T. AIKEN**, B.A. University of Western Ontario 2003; M.A. 2004; Ph.D. University of British Columbia 2010; Assistant Professor of Political Science/Global and Area Studies 2010, 2012.

**JUSTIN T. PICCORELLI**, B.A. Loyola Marymount University 2004; M.P.A. Cleveland State University 2009; Ph.D. 2014; Assistant Professor of Political Science 2015.

**Professors Emeriti:**

Winberg Chai, Larry Hubbell, Stephen C. Ropp, Oliver Walter

**Associate Professor Emeritus:**

Alan E. Schenker

Political Science is the study of how societies govern themselves and interact with one another. Courses of instruction in the Department of Political Science are offered in the following subfields: American politics, comparative government, international relations, political philosophy, public law, and public administration. Areas of focus include analysis of government structures and processes, citizens' influence on government,

policy content, philosophical concepts and traditions, political systems of other nations, and resolution of conflicts between nations. Our goals are to help students better understand political processes, and to develop the critical thinking and analytic skills necessary for: effective participation in the political process, successful careers in the public and private sectors, and further study in law, political science, and public administration.

In 1925, the state legislature passed a law requiring the study of the U.S. and Wyoming Constitutions by all University of Wyoming students. Political Science 1000 satisfies this requirement, but the requirement can also be satisfied by special examination given periodically by the Department of Political Science.

**Learning Outcomes**

We continuously and actively assess the Political Science undergraduate curriculum to ensure that the following learning outcomes are being met for each of our graduates:

1. Acquire a knowledge and understanding of the values, beliefs, and institutions that constitute governing processes;
2. Acquire an understanding of the distinctions among the major subfields of the discipline including: American politics and law, international relations, comparative politics, and political theory;
3. Develop a knowledge and understanding of citizens' roles within governing processes;
4. Acquire a knowledge of the theories and analytic skills necessary to evaluate conflicting arguments, assemble and present appropriate evidence, and make reasoned conclusions from the evidence available;
5. Communicate effectively, both orally and in written form.

**Undergraduate Major**

In addition to the university and college requirements listed elsewhere in this bulletin, a major in political science requires 33 hours. Students are required to complete the following four introductory courses: POLS 1000; POLS 1200 or POLS 1250; POLS 2310; and POLS 2460 or POLS 3600. Students are also required to take at least one seminar in political science (and its prerequisites); 8 hours of a single foreign language or equivalent credit by examination as determined by the Depart-

ment of Modern and Classical Languages; STAT 2070; and a minimum of 9 hours of upper division credit in political science. A maximum of 6 hours of internship credit may be applied toward the 33 hours required for the political science major. Only those political science courses in which a grade of C or better has been earned may be used to satisfy departmental requirements.

Most university studies courses and lower division political science courses should be completed prior to the junior year. Additional information about the political science major may be obtained from the Department of Political Science office, 136 A&S Building.

**Undergraduate Minors**

The department offers optional undergraduate minors in American politics, international relations and comparative government, public law, and political theory. Eighteen hours are required in each minor, including 9 hours of upper-division courses and one seminar. A maximum of 3 hours of internship credit may be applied towards the 18 hours required for the political science minor. At least 12 credit hours in a minor must be from courses *not* being counted toward the student's major. Information relating to specific courses fulfilling minor requirements may be obtained from the Department of Political Science office, 136 A&S Building.

**Teacher Education**

The teacher certification program in Secondary Social Studies Education, with a concurrent major in Political Science is available through the College of Education. A minimum 2.50 UW grade point average and a 2.50 grade point average in Political Science and Social Studies content are required to change majors. Further information may be found under the College of Education section in this *Catalog*.

**Major or Minor in Environment and Natural Resources**

The Haub School of Environment and Natural Resources (ENR) offers a second major or minor for students interested in interdisciplinary training in the policy, legal, economic, scientific, ethical, and other perspectives associated with ENR challenges. The Haub School uses problem-based learning and interdisciplinary team teaching. Students of all disciplines are welcome to take classes in ENR or add ENR to their degree program. Contact the Haub School at (307) 766-5080, [senr@uwo.edu](mailto:senr@uwo.edu), or [www.uwo.edu/enr](http://www.uwo.edu/enr).

## Graduate Study

The master of arts and the master of public administration are offered by the Department of Political Science. The department's mission is to give graduate students an understanding of the theories and methods necessary for success in (1) research or in post-baccalaureate study in any of the subfields in political science, (2) high school teaching in social science, or (3) careers in policy analysis or public administration in local, state, or federal government, or international governmental or non-governmental organizations. Our graduate students have progressed to senior positions in government, the U.S. Foreign Service, and international organizations; they have pursued rewarding careers in education and the private sector; and they have advanced to Ph.D. programs in political science and related fields.

### Program Specific Admission Requirements

#### *Master of Arts in Political Science*

Admission is open to all students holding a bachelor's degree with at least a 3.0 GPA in political science or a cognate discipline such as international studies, criminal justice, history, sociology, or economics, including substantial undergraduate course work in political science and a minimum GRE score of 60th percentile in Verbal and 40th percentile in Quantitative. Applicants must submit a writing sample of at least 10 pages such as a paper prepared for an undergraduate class.

#### *Master of Public Administration*

Admission is open to all students holding a bachelor's degree in any major with at least a 3.0 GPA and a minimum GRE score of 60th percentile in Verbal and 40th percentile in Quantitative. Only POLS 5000 may be taken prior to full admission into the program with permission of the M.P.A. director.

### Program Specific Degree Requirements

#### *Master's Programs*

#### *Master of Arts in Political Science*

##### *Plan A (thesis)*

At least 30 hours of graduate credit, to include:

- POLS 5510. Public Policy and Program Management.
- POLS 5680. Research Methods for Political Science.
- POLS 5684. Program Evaluation and Policy Analysis.

POLS 5810. Seminar in Political Philosophy.

At least 6 additional hours of coursework in political science.

A maximum of 9 hours of coursework in disciplines other than political science.

A minimum of 4 hours thesis research.

A master's thesis demonstrating independent research, written under the supervision of the major professor.

An oral examination conducted by the graduate committee covering all coursework and the thesis.

No more than 6 hours of grades lower than 3.0 may be counted toward the minimum number of hours required for the degree.

Students must maintain a graduate GPA of 3.0.

##### *Plan B (non-thesis)*

At least 30 hours of graduate credit, to include:

POLS 5510. Public Policy and Program Management.

POLS 5680. Research Methods for Political Science.

POLS 5684. Program Evaluation and Policy Analysis.

POLS 5810. Seminar in Political Philosophy.

At least 6 additional hours of coursework in political science.

A maximum of 12 hours of coursework in disciplines other than political science.

Plan B paper that reflects the quality but not scope of a master's thesis, written under the supervision of the major professor.

An oral examination conducted by the graduate committee covering all coursework and the Plan B paper.

No more than 6 hours of grades lower than 3.0 may be counted toward the minimum number of hours required for the degree.

Students must maintain a graduate GPA of 3.0.

##### *Master of Public Administration*

##### *Plan B (non-thesis)*

Thirty-nine hours of graduate credit, to include:

- 21 hours of core credit,
- 6 hours of option-core credit,
- 12 hours of approved elective credit.

In addition to graduate coursework, M.P.A. students must complete a series of papers constituting the Plan B project. It is the purpose of POLS 5690, Capstone in Public Management, to be a framework within which students initiate and substantially complete their Plan B projects.

Following the completion of all other requirements, the M.P.A. student is required to pass a comprehensive oral examination covering the information contained within his/her program of study as well as a defense of the Plan B projects. The oral examination is also conducted within the framework of the POLS 5690 Capstone course.

Significant administrative experience is required of all M.P.A. graduates.

If the M.P.A. student has little or no administrative experience an internship is required and will be included as 3 hours of the required elective credits.

Students entering the M.P.A. Program are expected to possess basic computer literacy, and to have access to a computer for such purposes as communicating with professors via e-mail, receiving M.P.A. Program memos, conducting research on the Web, retrieving articles from course documents libraries, working on course projects, and for conducting interactive/electronic class discussion.

Students must maintain a graduate GPA of 3.0.

Students must complete the CAPP program in lieu of a program of study.

##### *Master of Public Administration/Juris Doctor*

See the M.P.A. Director and/or the College of Law for information.

Students must be accepted to both programs.

## Political Science (POLS)

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).**

**1000. American and Wyoming Government. 3. [V♦V]** Introduction to the Constitutions and governmental processes of the U.S. and Wyoming. (Offered each semester)

**1100. Wyoming Government. 1. [(none)♦V]** Introduction to the Constitution and governmental process of Wyoming. Intended for students who have earned credit for American Government at an out-of-state college or by Advance Placement but have not fulfilled the Wyoming Constitution requirement of University Studies.

**1101. First-Year Seminar. 3. [(none)♦FYS]**

**1111. Issues in Political Science. 1-3 (Max. 3). [I,L♦(none)]** Introduces students to Political Science through a study of a contemporary issue or problem from the perspectives of the various subfields.

**1200. Non-Western Political Cultures. 3. [CS,G♦(none)]** Gives students appreciation of non-western political cultures and how these cultures have created different political institutions and practices. Non-Western nations of Asia, Africa, and the Middle East are used as case studies. Cross listed with INST 1200. (Offered each semester)

**1250. Introduction to Comparative Government. 3.** How do foreign states deal with the numerous challenges to their stability? Do institutions affect a state's approach to solving different problems? How do these different approaches affect policy? This course introduces students to different styles of governance and compare countries from around the world with reference to their political ideology. Cross listed with INST 1250.

**2000. Current Issues in American Government. 3. [CS♦(none)]** Examines current political topics in the U.S. Focuses on key public policy problems, policy-making process and the final policy choice. Students must keep abreast of political events on daily basis and apply basic concepts in American government to current affairs. *Prerequisite:* POLS 1000.

**2070. Politics of State and Local Government. 3.** Studies politics, organizations, structures and processes of American state and local governments. *Prerequisite:* POLS 1000.

**2200. Politics of Europe and the European Union. 3. [(none)♦COM2]** Examines formal and informal aspects of politics in European countries and the European Union.

**2290. Governments and Politics of Latin America. 3.** Studies chief cultural and historical factors influencing Latin American political process. Surveys major institutions and political patterns of the region.

**2300. World Politics in the Post-Cold War Era. 3. [G♦(none)]** Examines changes that have taken place since the end of the Cold War in perspectives of major world powers, global and regional power balances, patterns of conflict and cooperation and the structure of the world system. Focuses on what these changes portend for the future. Cross listed with INST 2300.

**2310. Introduction to International Relations. 3. [G♦(none)]** Analyzes the nature of international relations, emphasizing various methods of explaining and interpreting the international behavior of nation-states. Illustrates contemporary problems in world politics. Cross listed with INST 2310. (Normally offered once a year)

**2330. Environmental Ethics. 3.** Introduces students to ethical theory in environmental problem cases, and to philosophical issues in environmental philosophy. Ethical theories

include natural law, utilitarianism, deontological and rights-based theories, relativism. Topics may include: conservation/preservation, resource management, pollution, overpopulation, factory farming, Leopold's land ethic, deep ecology, holism, eco-feminism. Cross listed with PHIL 2330.

**2410. Introduction to Public Administration. 3.** Deals with executive branches of governments in the U.S.: national, state and local. Considers organizational, political and policy-making aspects of each. Discusses administration in other forms of government, such as interstate compacts and regional agreements. *Prerequisite:* POLS 1000.

**2420. Women and Politics. 3.** Describes and compares status and political activity of women in America with those of women and men in other societies in order to explore causes, methods and results of political involvement by women. Cross listed with WMST 2420. *Prerequisite:* POLS 1000.

**2430. Parties, Interest Groups and Elections. 3. [CS♦(none)]** Studies nature and functions of political organizations in American democracy. Discusses origins and evolution of American parties, causes of interest group development, political socialization, political participation and voting behavior, as well as activities of interest groups within American society and political system. Emphasizes current trends regarding role of parties versus interest groups. *Prerequisite:* POLS 1000.

**2450. Politics and Media. 3.** Examines the media's coverage of current events, governmental institutions and electoral campaigns. Discusses effect of media on individuals' opinions and behavior. *Prerequisite:* POLS 1000.

**2460. Introduction to Political Philosophy. 3.** Surveys history of Western political thought including study of concepts and approaches to political philosophy. (Offered once a year)

**2490. Topics In: \_\_. 1-3 (Max. 6).** Accommodates various specialized subjects not offered as regular courses. *Prerequisite:* POLS 1000.

**3050. Athenian Democracy. 3.** Examines democratic government in ancient Athens: its origins and development, its practical workings, how politics were conducted and power was gained and exercised, citizen participation, law courts, and evaluations of democracy in the ancient world and since. Cross listed with CLAS/HIST 3050. *Prerequisite:* WB.

**3100 [2100]. Politics and the Judicial Process. 3.** Analyzes courts and their personnel in the American political system, including examination of functions of courts, characteristics of judicial process, approaches to the study of judicial behavior, and role of courts as policy makers. *Prerequisite:* POLS 1000.

**3200. Comparative Political Cultures. 3.** Histories and experiences of various societies have shaped their values, norms, beliefs, expectations and attitudes. Explore how the beliefs, values and lifestyles of various societies shape peoples' views of their place in the politics of the state and of the state's place in their daily lives. Cross listed with INST 3200. *Prerequisites:* 9 hours of INST or POLS.

**3220. Government and Politics of Russia and FSU. 3.** Examines the political, economic and identity transitions of Russia and other states of the former Soviet Union during the post-communist era. Explores how current challenges relate to past Soviet practices.

**3270. Governments and Politics of the Middle East. 3.** Acquaints students with basic political, social and economic institutions of Middle Eastern countries. Emphasizes post-World War I developments, contemporary issues and problems. Special attention is given to politics of major nations in the Middle East such as Turkey, Iran, Israel, Egypt, Saudi Arabia, Iraq and Syria.

**3300. Model United Nations. 1-3 (Max. 6).** Focuses on the United Nations (UN) system and multilateral diplomacy to prepare students to participate in a Model UN simulation. Students learn to evaluate the UN system, learn strategies to address international problems, and develop skills to effectively represent a country in a role-playing exercise. *Prerequisite:* 9 hours of POLS or INST.

**3520. Voting and Participation in America. 3.** Examines the ways citizens participate in government, including campaigning, donating money, and voting. Topics include mobilization by parties and campaigns, social and demographic differences in participation, explanations of voting behavior, civic responsibility, and the role of participation in a democracy. *Prerequisite:* POLS 1000.

**3550. Political Communication. 3.** Examines the intersection of politics and communication. For example, may cover politics and media, interpersonal political discussion, organizational and governmental political communication, political campaigns, politics and technology, etc. Moreover, it may cover the effects of political communication on individuals' opinions and behavior. Cross listed with COJO 3550. *Prerequisites:* COJO 1000, COJO 1040, or POLS 1000.

**3600. American Political Thought. 3. [WB♦(none)]** Examines key primary sources and traditions from the founding to present. *Prerequisite:* POLS 1000.

**3610. Classics in Environmental Thought.**

**3.** Surveys classic texts in environmental thought from the nineteenth century through the present. *Prerequisite:* POLS 1000.

**3620. Environmental Justice. 3.** Examines core philosophical understandings of justice and applies them to the environment through a variety of case studies, analytical essays and monographs. Cross listed with ENR 3620. *Prerequisite:* POLS 1000.

**3680 [2020]. Introduction to Empirical Political Analysis. 3. [(none)◀▶COM2]**

Introduces students to concepts, approaches and methodologies for empirical analysis of political problems. Students gain practical experience in communicating and presenting statistical analysis of of political data generated through surveys and other research techniques. *Prerequisites:* STAT 2050, 2070 or equivalent.

**4013. Political Geography. 3.** Geographic space is subdivided into political units to aid human interaction and to facilitate political processes. Examines the spatial organization of political space and its effects upon political processes at varying geographic scales ranging from the local to international. Dual listed with POLS 5013; cross listed with GEOG 4013. *Prerequisite:* GEOG 1000 or 1020, or 9 hours of social science.

**4051 [4050]. Environmental Politics. 3. [WC▶(none)]** Analyzes environmentalism as a political phenomenon. Provides students with a basic understanding of how to analyze political issues by: (1) examining the historical and contemporary issues that produce controversy over environmental matters; and (2) surveying the impacts of these issues on the formulation and implementation of laws, policies, and regulations. Cross listed with AMST, ENR, GEOG and REWM 4051. Dual listed with POLS 5051. *Prerequisite:* POLS 1000.

**4052. Federal Land Politics. 3.** Examines the political forces that have shaped and continue to shape federal land policy and management. Explores the interactions between democratic decision making and science in the management of federal lands. Surveys the sources of controversy over federal land management and methods for harmonizing public demands with technical expertise. Cross listed with AMST/ENR/GEOG/REWM 4052. *Prerequisite:* POLS 1000.

**4090. Anglo-American Jurisprudence. 3.** Considers topics, such as functions of law in a democratic society; historical origins and growth of the common law as contrasted to the civil (code) law systems; and principal theories of nature and functions of law which

have influenced development of English and American legal institutions. Dual listed with POLS 5090. *Prerequisite:* 9 hours of political science or philosophy.

**4100. Constitutional Law: Institutional Powers. 3.** Encompasses case-study analysis of judicial decisions and policies affecting constitutional interrelationships among the three branches of federal government, federal-state relations, as well as powers of the states and federal government in the area of social and economic regulatory laws. Dual listed with POLS 5100. *Prerequisites:* POLS 1000, POLS 3100 recommended.

**4110. Constitutional Law: Civil Liberties and Rights. 3.** Encompasses case-study analysis of judicial decisions and policies of the constitutional interpretation of the 1st Amendment (freedom of speech, press, association and religion), privacy rights, the rights of the criminally accused, and civil rights (racial and gender equality). Dual listed with POLS 5110; cross listed with CRMJ 4110. *Prerequisites:* POLS 1000, POLS 3100 recommended.

**4220. European Union. 3.** Examines the European Union's history, institutional structures, and policy areas and explores the positive and negative effects of European integration. Dual listed with POLS 5220. *Prerequisites:* 9 hours of political science or international studies including POLS 2310.

**4230. Governments and Politics of Asia. 3.** Studies political systems of East Asia. Analyzes impact of social and economic factors upon political institutions. Dual listed with POLS 5230. *Prerequisite:* 9 hours of political science or international studies.

**4240. Culture, Society, and Political Economy in East Asia. 3.** Discusses how culture, history, social systems and political institutions of East Asian nations have contributed to their political economy of rapid industrialization and social transformation. Dual listed with POLS 5240. *Prerequisite:* one course in global studies; two courses in political science, international studies, history or sociology.

**4255. Politics of Developing Nations. 3.** An analysis of the processes of political, economic and social change in the non-Western world. Dual listed with POLS 5255. Cross listed with INST 4255. *Prerequisites:* 9 hours of political science or international studies.

**4260. Democratization and Regime Change. 3.** Examines the theoretical/empirical research on causes of democratic transition and consolidation, including new waves of democratization and prospects for democratization in other contexts. Focus is given to a variety of theoretical/methodological perspectives such as the structural, strategic,

social/cultural, institutional, and economic approaches. Dual listed with POLS 5260; cross listed with INST 4260. *Prerequisites:* 9 hours of political science or international studies.

**4290. Inter-American Relations. 3.** Surveys inter-American system and idea of hemispheric unity. Analyzes major issues confronting inter-American community. Dual listed with POLS 5290. Cross listed with INST 4290. *Prerequisite:* 9 hours of political science or international studies including POLS 2310.

**4300. The World System. 3.** Analyzes structure of political and economic interdependence among nation-states. Reviews and assesses theoretical approaches to explaining changing structure of inequality, power, war and peace. Dual listed with POLS 5300. Cross listed with INST/SOC 4300. *Prerequisite:* SOC 1000 or ANTH 1100 or equivalent political science, international studies, or social science course.

**4330. American Foreign Relations. 3.** Analyzes American foreign policy decision-making process and selected contemporary foreign policy problems. Stresses political and institutional factors, along with analysis of policy options. Dual listed with POLS 5330. Cross listed with INST 4330. *Prerequisite:* 9 hours of political science or international studies including POLS 2310.

**4340. International Organizations. 3.** Encompasses development of world organizations, such as League of Nations, United Nations and its affiliate bodies. Also studies regional organizations and private international bodies. Dual listed with POLS 5340. Cross listed with INST 4340. *Prerequisite:* 9 hours of political science or international studies including POLS 2310.

**4350. Sustainable Development and Global Policy. 3.** Considers in-depth meaning of "sustainable development" and trade-offs necessary to achieve it. Considers this issue from global perspective through application of theories in economics, political science, international relations, technology studies and ethics. Dual listed with POLS 5350. *Prerequisite:* 9 hours of political science, international studies, or economics.

**4360. International Peace and Conflict. 3.** Why do nations go to war, engage in atrocities such as genocide, or move toward peace following conflict? Examines underlying processes behind both conflict and peace in the international system, including sources of conflict and ways conflicts might be moved toward sustainable peace. Dual listed with POLS 5360; cross listed with INST 4360. *Prerequisites:* 9 hours of political science or international studies including POLS 2310.

**4375. Transitional Justice. 3.** Mechanisms provide accountability for gross human rights violations and acts of mass atrocity within nations. Case studies are used to examine types of transitional justice interventions; tensions between demands of justice at local, national, and international levels; and transitional justice's role in post-conflict peace-building and reconciliation. Dual listed with POLS 5375; cross listed with INST 4375. *Prerequisite:* 9 hours of political science or international studies including POLS 2310.

**4400. Black Politics, 1867 to the Present. 3.** Afro-American participation in partisan electoral politics in the United States from Reconstruction to the current presidential election. Cross listed with AAST 4400. *Prerequisites:* AAST 1000, any AASAT 2000-level course, or POLS 1000 and junior/senior standing.

**4420. Seminar in Public Administration. 3 (Max. 6).** Includes reading and research in selected public administration topics. Dual listed with POLS 5420. *Prerequisite:* 9 hours of political science and consent of instructor.

**4430. United States Presidency. 3.** Analyzes office of president, its roles, development, relationships with other governmental agencies and problems in the contemporary world. Dual listed with POLS 5430. *Prerequisite:* 9 hours of political science.

**4435. Presidential Elections. 3.** Examines the process of electing the U.S. president. Topics include the roles of presidential primaries, caucuses, and conventions; campaign strategies; media coverage; citizen participation; the electoral college; and reforms. Dual listed with POLS 5435. *Prerequisite:* POLS 1000.

**4455. Energy Security. 3.** Evaluates the geopolitical and socioeconomic issues surrounding the roots of energy insecurity and the global challenge to provide adequate, affordable, and accessible energy. Topics of study include the questions of energy nationalism, climate security, import dependence and transportation insecurities, the future of fossil fuels and alternative energies. Dual listed with POLS 5455. Cross listed with INST 4455. *Prerequisites:* 9 hours of INST or POLS, including INST/POLS 2310.

**4510. Seminar in Political Behavior. 3 (Max. 6).** Examines behavior of participants in political systems with special emphasis on demographic and other variables and their influence. *Prerequisites:* 9 hours of political science and consent of instructor.

**4520. Public Opinion. 3.** Deals with natures of a public in democracy and means of forming and manipulating public opinion. Emphasizes role of public opinion as essential ingredient of

the policy-making process in popular government. Dual listed with POLS 5520. *Prerequisite:* 9 hours of political science.

**4530. U.S. Congress. 3.** Analyzes aspects of the U.S. Congress, including election of congressmen, legislative process, congressional-presidential relations, and the influence of political parties, interest groups, and constituents on the legislative process. Dual listed with POLS 5530. *Prerequisite:* POLS 1000.

**4550. Internship in Government. 1-6 (Max. 6).** Integrates practical political experience with academic knowledge. Students are expected to participate in specifically assigned duties and observe broader activities of the sponsoring organization; then, reflect upon this participation and observation in the form of written assignments. Internship credit can be earned for work in political campaigns, Wyoming Legislature or government services. Offered for S/U only. *Prerequisite:* 9 hours of political science.

**4560. Washington Semester Program. 15.** Provides students with paid internships in Washington, D.C., in either congressional offices or federal agencies. Selection into the program is very competitive and is made the semester prior to service. Offered for S/U only. *Prerequisites:* POLS 1000 and 6 additional hours of political science courses.

**4600. Political Violence. 3.** Examines causes and consequences of violence both among individuals and among nations. Dual listed with POLS 5600; cross listed with CRMJ 4600. *Prerequisites:* POLS 1000 or SOC 1000. (Normally offered every other year)

**4640. Political Philosophy: Ancient and Medieval. 3.** Surveys political philosophy from Classical Greek period to Machiavelli. Dual listed with POLS 5640. *Prerequisite:* POLS 1000; POLS 2460 or 3600 recommended.

**4650. Political Philosophy: Modern. 3.** Surveys political philosophy from Machiavelli to present. Dual listed with POLS 5650. *Prerequisite:* POLS 1000; POLS 2460 or 3600 recommended.

**4660. Political Philosophy: Contemporary. 3.** Examines central developments in political philosophy that guide action in today's world. Dual listed with POLS 5660. *Prerequisite:* POLS 1000; POLS 2460 or 3600 recommended.

**4685. Program Evaluation and Policy Analysis. 3.** Explores techniques for analyzing and evaluating public policy choices and impacts. Dual listed with POLS 5685. *Prerequisites:* STAT 2050, 2070 or equivalent and an introductory research methods course in a social science or related discipline.

**4700. Readings in Political Science. 1-3 (Max. 6).** Outlines special programs of readings in government and politics to meet needs of individual students. *Prerequisite:* 9 hours of political science.

**4710. Topics in \_\_\_\_\_. 1-3 (Max. 9).** Accommodates various specialized subjects not offered as regular courses. *Prerequisites:* POLS 1000 and 3 additional hours of political science.

**4720. Workshop in Practical Politics. 1-3 (Max. 6).** Familiarizes or strengthens participants in techniques of political effectiveness. Includes political organization, campaigning and persuasion. Guest speakers include public officials and experts in the field of practical politics. *Prerequisite:* 9 hours of political science.

**4810. Seminar in Political Philosophy. 3 (Max. 6).** [(none)◀COM3] Seminar in Political Philosophy; Encompasses reading and research on selected problems in political philosophy. Dual listed with POLS 5810. *Prerequisite:* consent of instructor.

**4840. Seminar in Public Law. 3 (Max. 6).** [(none)◀COM3] Includes reading and research on selected problems in public law. *Prerequisite:* POLS 1000, 3100 and consent of instructor.

**4850. Seminar in American Politics and Institutions. 3 (Max. 6).** [(none)◀COM3] Includes reading and research on selected U.S. government and politics problems. Dual listed with POLS 5850. *Prerequisite:* consent of instructor.

**4865. [4900] Seminar in International Relations Theories. 3 (Max. 6).** Examines theoretical issues in the study of international politics by analyzing major theoretical schools of thought in the study of international relations such as realism, constructivism, and theories of foreign policy. Dual listed with POLS 5865. *Prerequisites:* 9 hours of political science or international studies including POLS 2310 and consent of instructor.

**4870. Seminar in International Relations. 3 (Max. 6).** [(none)◀COM3] Encompasses reading and research in international law and politics. Dual listed with POLS 5870. *Prerequisites:* 9 hours of political science or international studies including POLS 2310 and consent of instructor.

**4875 [4910]. Seminar in Comparative Foreign Policy Analysis. 3 (Max. 6).** Overviews theories and approaches to cross-national analysis of foreign policy. Examines foreign policies of advanced industrial democracies, Russia and various Third World nations. Emphasizes foreign policy decision making processes in non-American settings. Dual



listed with POLS 5875. *Prerequisites:* 9 hours of political science or international studies including POLS 2310 and consent of instructor.

**4890. Seminar in Comparative Government and Politics. 3 (Max. 6).** [WC,G◀(none)] Researches selected topics in comparative government and politics. Dual listed with POLS 5890. *Prerequisite:* 9 hours of political science or international studies and consent of instructor.

**5000. Survey of Public Administration. 3.** Designed to introduce the beginning graduate student to the study and practice of public administration at all levels of government. Attention is also directed to specific functions and processes such as intergovernmental relations, budgeting, personnel, and regulation. *Prerequisite:* graduate status and consent of instructor.

**5013. Political Geography. 3.** Geographic space is subdivided into political units to aid human interaction and to facilitate political processes. Examines the spatial organization of political space and its effects upon political processes at varying geographic scales ranging from the local to international. Cross listed with POLS 4013 and dual listed with GEOG 4013/5013. *Prerequisite:* GEOG 1000 or 1020, or 9 hours of social science.

**5051. Environmental Politics. 3.** Analyzes environmentalism as a political phenomenon. Provides students with a basic understanding of how to analyze political issues by: (1) examining the historical and contemporary issues that produce controversy over environmental matters; and (2) surveying the impacts of these issues on the formulation and implementation of laws, policies, and regulations. Dual listed with POLS 4051; cross listed with AMST/ENR/GEOG/REWM 4051. *Prerequisite:* POLS 1000.

**5060. American Intergovernmental Relations. 3.** Theory and practice of American federalism. *Prerequisite:* POLS 5000.

**5080. Organizational Development. 3.** Exposed to psychological concepts as they apply to organizations. Topics include organizational culture, motivations affecting a person's behavior in the workplace, personal interactions within organizations, and resolution of personal conflicts within the workplace. *Prerequisite:* POLS 5000.

**5090. Anglo-American Jurisprudence. 3.** Considers topics, such as functions of law in a democratic society; historical origins and growth of the common law as contrasted to the civil (code) law systems; and principal theories of nature and functions of law which have influenced development of English and American legal institutions. Dual listed with PHIL/POLS 4090. *Prerequisite:* 9 hours of political science.

**5100. Constitutional Law: Institutional Powers. 3.** Encompasses case-study analysis of judicial decisions and policies affecting constitutional interrelationships among the three branches of federal government, federal-state relations, as well as powers of the states and federal government in the area of social and economic regulatory laws. Dual listed with POLS 4100. *Prerequisites:* 9 hours of Political Science, POLS 3100 recommended.

**5110. Constitutional Law: Civil Liberties and Civil Rights. 3.** Encompasses case-study analysis of judicial decisions and policies of the constitutional interpretation of the 1st Amendment (freedom of speech, press, association and religion), privacy rights, the rights of the criminally accused, and civil rights (racial and gender equality). Dual listed with POLS 4110. *Prerequisites:* POLS 1000, POLS 3100 recommended.

**5210. Seminar in Human Security. 3-6 (Max. 6).** A broad interdisciplinary approach to the study of human security within the field of international studies and global politics in order to explore the theories and processes that explain past and emerging patterns of behavior in the international system, as well as key aspects of local to global policymaking. Dual listed with INST 5210.

**5220. European Union. 3.** Examines the European Union's history, institutional structures, and policy areas and explores the positive and negative effects of European integration. Dual listed with POLS 4220. *Prerequisites:* 9 hours of political science or international studies including POLS 2310.

**5230. Governments and Politics Of Asia. 3.** Studies political systems of East Asia. Analyzes impact of social and economic factors upon political institutions. Dual listed with POLS 4230. *Prerequisite:* 9 hours of political science or international studies.

**5240. Culture, Society, and Political Economy in East Asia. 3.** Discusses how culture, history, social systems, and political institutions of East Asian nations have contributed to their political economy of rapid industrialization and social transformation. Dual listed with POLS 4240. *Prerequisite:* one course in global studies; two courses in political science, international studies, history or sociology.

**5255. Politics of Developing Nations. 3.** An analysis of the processes of political, economic and social change in the non-Western world. Dual listed with POLS 4255. Cross listed with INST 5255. *Prerequisites:* 9 hours of political science or international studies.

**5290. Inter-American Relations. 3.** A survey of the inter-American system and the idea of hemispheric unity, followed by an analysis

of the major issues confronting the inter-American community. Dual listed with POLS 4290. *Prerequisite:* 9 hours of political science or international studies, including POLS 2310.

**5300. The World System. 3.** Analyzes structure of political and economic interdependence among nation-states. Reviews and assesses theoretical approaches to explaining changing structure of inequality, power, war and peace. Dual listed with POLS 4300. Cross listed with INST/SOC 5300. *Prerequisite:* SOC 1000 or ANTH 1100 or equivalent political science, international studies, or social science course.

**5330. American Foreign Relations. 3.** Analyzes American foreign policy decision-making process and selected contemporary foreign policy problems. Stresses political and institutional factors along with analysis of policy options. Dual listed with POLS 4330. Cross listed with INST 5330. *Prerequisite:* 9 hours of political science or international studies including POLS 2310.

**5340. International Organizations. 3.** Encompasses development of world organizations such as League of Nations, United Nations and its affiliate bodies. Also studies regional organizations and private international bodies. Dual listed with POLS 4340. *Prerequisite:* 9 hours of political science including POLS 2310.

**5350. Sustainable Development and Global Policy. 3.** Considers in-depth meaning of "sustainable development" and trade-offs necessary to achieve it. Considers this issue from global perspective through application of theories in economics, political science, international relations, technology studies and ethics. Dual listed with POLS 4350. *Prerequisite:* 9 hours of political science or economics.

**5360. International Peace and Conflict. 3.** Why do nations go to war, engage in atrocities such as genocide, or move toward peace following conflict? Examines underlying processes behind both conflict and peace in the international system, including sources of conflict and ways conflicts might be moved toward sustainable peace. Dual listed with POLS 4360; cross listed with INST 5360. *Prerequisites:* 9 hours of political science or international studies including POLS 2310.

**5375. Transitional Justice. 3.** Mechanisms provide accountability for gross human rights violations and acts of mass atrocity within nations. Case studies are used to examine types of transitional justice interventions; tensions between demands of justice at local, national, and international levels; and transitional justice's role in post-conflict peace-building and reconciliation. Dual listed with POLS 4375;

cross listed with INST 5375. *Prerequisites:* 9 hours of political science or international studies including POLS 2310.

**5400. Public Personnel Management. 3.** Designed to integrate information about the political environment of personnel administration with problem solving exercises in such specific areas as job analysis, affirmative action, and flextime. A number of topics including the evolution of the civil service, the rights and responsibilities of governmental employees, the functions of public personnel management, and collective bargaining processes are also covered. *Prerequisite:* POLS 5000.

**5410. Administrative Behavior and Theory of Organization. 3.** An advanced course in the theory of organization and the workings of public agencies. *Prerequisite:* POLS 5000.

**5420. Seminar In Public Administration. 3 (Max. 6).** A reading and research course in selected topics in public administration. Dual listed with POLS 4420. *Prerequisites:* POLS 2410 and consent of instructor.

**5430. United States Presidency. 3.** Analyzes the office of the president, its roles, development, relationships with other governmental agencies, and problems in the contemporary world. Dual listed with POLS 4430. *Prerequisite:* 9 hours of political science.

**5435. Presidential Elections. 3.** Examines the process of electing the U.S. president. Topics include the roles of presidential primaries, caucuses, and conventions; campaign strategies; media coverage; citizen participation; the electoral college; and reforms. Dual listed with POLS 4435. *Prerequisite:* POLS 1000.

**5440. Principles and Processes of Government Budgeting. 3.** Analyzes the principles, processes and politics of the budgetary process in the U.S. It examines the various theories of budgetary decision-making, the politics of budgeting and budgetary reforms. *Prerequisite:* POLS 5000 and graduate standing.

**5450. Administrative Regulation. 3.** Significant points of contact between government and business are stressed. Government activities designed to regulate and aid such economic interests as business, labor, agriculture, and consumers are dealt with at length. *Prerequisite:* POLS 5000.

**5455. Energy Security. 3.** Evaluates the geopolitical and socioeconomic issues surrounding the roots of energy insecurity and the global challenge to provide adequate, affordable, and accessible energy. Topics of study include the questions of energy nationalism, climate security, import dependence and transportation insecurities, the future of fossil fuels and alternative energies. Dual listed with

POLS 4455. Cross listed with INST 5455. *Prerequisites:* 9 hours of INST or POLS, including INST/POLS 2310.

**5460. Public Administration and Law. 3.** Focuses on various facets of the relationship between American public administration and law. Emphasis is placed on the emerging body of administrative law as a context for jurisprudential reasoning in administrative decision making. *Prerequisite:* POLS 5000.

**5470. E-Government. 3.** Introduces the technology of electronic government by delving into the issues surrounding the usage of web-based service delivery systems and other technological innovations, including how public administrators can better use technological systems and communication with users and IT providers. *Prerequisite:* POLS 5000.

**5480. Ethics In Government. 3.** The student is introduced to the ethical nature and dilemmas of public administration in American constitutional government. Such topics are addressed as source of ethical obligation, role of loyalty, application of moral philosophy, constitutional theory and ethical obligation, relation of theory and practice, and methods of ethical reflection. *Prerequisite:* POLS 5000.

**5500. Internship in Public Administration. 1-6 (Max. 6).** Educationally-oriented assignments for work in selected public agencies, with tutorial types of supervision. Offered S/U only. *Prerequisite:* consent of instructor.

**5510. Public Policy and Program Management. 3.** An overview of governmental policy making processes in the U.S. Attention is then shifted to the uses of applied policy analysis. Students are required to participate in a project which employs a systems approach to deal with managerial problems within a public sector or nonprofit organization. *Prerequisite:* POLS 5000.

**5520. Public Opinion. 3.** Deals with natures of a public in a democracy and means of forming and manipulating public opinion. Emphasizes the role of public opinion as an essential ingredient of the policy-making process in popular government. Dual listed with POLS 4520. *Prerequisite:* 9 hours of political science.

**5530. U.S. Congress. 3.** Analyze aspects of the U.S. Congress, including election of congressmen, legislative process, congressional-presidential relations, and the influence of political parties, interest groups, and constituents on the legislative process. *Prerequisite:* 9 hours of political science.

**5540. Public Policy Perspectives. 3.** Acquaints students with the underlying structure and dynamics of public policy formulation, implementation, and evaluation at the state,

local, and federal levels. Drawing on a number of analytic approaches, the course seeks to understand this complex political phenomenon in the context of the institutions that drive it. *Prerequisite:* graduate standing.

**5560. Public Administration in Literature and Film. 3.** Examines the ways novelists and directors have viewed public administration, the accuracy of portrayals, how views have changed, how novelists and directors have helped create and disparage the rise of the administrative state, and types of administrative arrangements favored. *Prerequisite:* POLS 5000.

**5570. Graduate Readings. 1-3 (Max. 9).** Special programs of readings of government and politics will be outlined to meet needs of individual students. *Prerequisite:* graduate standing or consent of instructor.

**5600. Political Violence. 3.** Examines causes and consequences of violence both among individuals and among nations. Dual listed with POLS 4600. *Prerequisites:* POLS 1000 or SOC 1000.

**5640. Political Philosophy: Ancient and Medieval. 3.** Surveys political philosophy from Classical Greek period to Machiavelli. Dual listed with POLS 4640. *Prerequisite:* POLS 1000; POLS 2460 or 3600 recommended.

**5650. Political Philosophy: Modern. 3.** Surveys political philosophy from Machiavelli to present. Dual listed with POLS 4650. *Prerequisite:* POLS 1000; POLS 2460 or 3600 recommended.

**5660. Political Philosophy: Contemporary. 3.** Examines central developments in political philosophy that guide action in today's world. Dual listed with POLS 4660. *Prerequisite:* POLS 1000; POLS 2460 or 3600 recommended.

**5680. Research Methods for Political Science. 3.** Introduction to methodology of empirical analysis appropriate for political science and public policy, including introduction to the philosophy of science, research designs, hypothesis formation, measurement, and data collection. *Prerequisite:* STAT 2050, 2070, 5070 or equivalent.

**5681. Methods of Political Analysis. 3.** Introduction to methods of analysis focusing on understanding the strengths and weaknesses of each method and practical issues arising during the analysis stage of research. Covers quantitative analysis through multiple regression, case study analysis, and archival/historical analysis. *Prerequisite:* STAT 2050, 2070, 5070 or equivalent.

**5684. Empirical Analysis for Public Administration. 3.** Designed for students in public administration to train them to make decisions based on empirical evidence in policy

and management. Course draws concepts from system analysis, management science, operations research, and social science methodology to provide an understanding of various policy analysis and program management techniques across many applications. *Prerequisite:* POLS 5000.

**5685. Program Evaluation and Policy Analysis. 3.** Explores techniques for analyzing and evaluating public policy choices and impacts. Dual listed with POLS 4685. *Prerequisites:* STAT 5070 or equivalent and an introductory research methods course in social science or related discipline.

**5690. Capstone in Public Management. 3.** Integrates theories and concepts introduced in core and option-core courses, and emphasizes students' application of them to various administrative settings. *Prerequisite:* completion of all other core and option core requirements in the MPA Program.

**5710. Topics In Political Science. 1-3 (Max. 9).** Intended to accommodate various specialized subjects not offered as regular courses. *Prerequisite:* graduate standing.

**5810. Seminar in Political Philosophy. 3.** Encompasses reading and research on selected problems in political philosophy. Dual listed with POLS 4810. *Prerequisite:* consent of instructor.

**5850. Seminar in American Politics and Institutions. 3.** Includes reading and research on selected U.S. government and politics problems. Dual listed with POLS 4850. *Prerequisite:* consent of instructor.

**5865. Seminar in International Relations Theory. 3.** Examines theoretical issues in the study of international politics by analyzing major theoretical schools of thought in the study of international relations such as realism, idealism, constructivism, and theories of foreign policy. Dual listed with POLS 4865. *Prerequisite:* 9 hours of political science or international studies including POLS 2310 and consent of instructor.

**5870. Seminar in International Relations. 3.** Encompasses reading and research in international law and politics. Dual listed with POLS 4870. *Prerequisite:* 9 hours of Political Science or International Studies including POLS 2310 and consent of instructor.

**5875. Seminar in Comparison Foreign Policy Analysis. 3.** Overviews theories and approaches to cross-national analysis of foreign policy. Examines foreign policies of advanced industrial democracies, Russia, and various Third World nations. Emphasizes foreign policy decision making processes in non-American settings. Dual listed with POLS

4875. *Prerequisite:* 9 hours of political science or international studies including POLS 2310 and consent of instructor.

**5890. Seminar in Comparative Government and Politics. 3.** Researches selected topics in comparative government and politics. Dual listed with POLS 4890. *Prerequisite:* 9 hours of political science or international studies and consent of instructor.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Students are expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Psychology

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### Professors:

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**MATTHEW J. GRAY**, B.A. Creighton University 1993; M.S. Drake University 1995; Ph.D. University of Mississippi 2000; Professor of Psychology 2014, 2002.

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### Associate Professors:

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### Assistant Professors:

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**MEREDITH E. MINEAR**, B.S. University of Illinois at Urbana-Champaign 1994; Ph.D. University of Michigan 2004; Assistant Professor of Psychology 2013.

### Academic Professional Lecturer:

**TARA K. CLAPP**, B.A. State University of New York at Buffalo 2005; M.S. Niagara University 2010; Assistant Academic Professional Lecturer in Psychology 2012.

**SCOTT FRENG**, B.S. Black Hills State University 1995; M.A. University of South Dakota 1998; Ph.D. University of Nebraska - Lincoln 2001; Senior Lecturer in Psychology 2013, 2003.

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### Professor Emeritus

George Blau, Charles J. Ksir, Karen B. Nicholas

The Department of Psychology offers coursework at several levels:

1. Introductory courses for students in other programs who wish an elementary knowledge of psychology.
2. Courses supportive of work in other majors.
3. An undergraduate major that is sufficiently flexible to allow students to prepare for graduate programs in psychology, professional schools (e.g. law, medicine) or for employment after graduation.
4. Graduate course work leading to the Ph.D. in clinical psychology, social psychology, cognition/cognitive development, or psychology and law.

Facilities are available for course work and laboratory experiences in areas of psychology such as cognition, personality, social, biological psychology, cognitive development, and psychology and law.

Students who wish to increase chances of employment related to their undergraduate majors should consult an adviser concerning areas of specialization within psychology.

Students planning graduate work in psychology should consult with their faculty adviser concerning career choices and development.

## Learning Outcomes

We expect that our Psychology graduating students will have:

1. a basic knowledge of psychology and related fields.
2. the ability to evaluate the assumptions, purposes, methods, and results of psychological research and scholarship.
3. skills in teamwork, leadership, writing, speaking and listening, especially concerning psychology-related topics.

## Credit by Examination

Credit by examination will be allowed only for PSYC 1000. The examination accepted is the College Level Examination Program (CLEP); the passing score is 50.

## Advanced Placement

The psychology department will accept a score of 4 on the AP exam for credit in PSYC 1000, effective Fall 2015.

## Undergraduate Major

A major requires a minimum of 33 semester hours and may not exceed 60 hours in psychology. Of these, 18 hours must be at the 3000 level or above. These upper-division courses must also be taken from at least two different members of the psychology department faculty listed in this *Catalog*.

*Students must complete the following courses:*

PSYC 1000 General Psychology  
PSYC 2000 Research  
Psychological Methods

*Four of five cores:*

Biological, PSYC 2210 Drugs and Behavior **or**  
PSYC 2080 Biological Psychology Developmental, PSYC 2300 Developmental Psychology  
Clinical, PSYC 2340 Abnormal Psychology  
Social, PSYC 2380 Social Psychology  
Cognitive, PSYC 3120 Cognitive Psychology

Additionally **one** of the following restricted enrollment (seminar or writing intensive) courses is required: PSYC 4060, 4150, 4220, 4250, 4320, 4350, 4380, 4390, 4400, 4740, 4860.

Also required are 6 hours of anthropology, communication/journalism, criminal justice, economics, political science, or sociology; LIFE 1003 or 1010; and STAT 2050 or 2070.

One approved 3-4 credit hour STEM course: CHEM 1000, CHEM 1020, COSC 1010, COSC 1100, KIN/ZOO 2040, KIN/ZOO 2041, LIFE 2002, LIFE 2022, LIFE 2023, LIFE 2050, MATH 1050, MATH 1405, MATH 2200, MICR/MOLB 2021, PHYS 1050, PHYS 1110, STAT 2000, STAT 3050, or ZOO 3600.

For graduation, students must receive a C or better grade in all courses taken to satisfy department requirements.

Psychology courses taken 15 or more years ago will not be used to satisfy degree requirements.

## Undergraduate Minor

A minor in psychology requires 18 semester hours in psychology. These must include PSYC 1000 or equivalent and 9 hours at the 3000- level or above, with a grade of C or better.

Students seeking a minor in A&S must have 12 hours exclusive to the minor and not used in the major.

## Graduate Study

The Department of Psychology offers the doctor of philosophy in psychology with programs in clinical (APA accredited) psychology, social psychology, cognition/cognitive development, and psychology and law.

## Program Specific Admission Requirements

The deadline for receipt of all application materials is January 15.

We only admit students one time per year.

Our graduate students begin their programs of study in the fall semester.

Application materials include the application, one to two page personal statement, official undergraduate and graduate (if applicable) transcripts, official GRE scores (general and Advanced Psychology subject), and three letters of recommendation. An application fee of \$50 is required.

Applications are evaluated based on the applicants' academic qualifications (e.g., GRE scores, undergraduate GPA) and interests. Particular attention is paid to the goodness of fit between the applicant's expressed interests and the particular strengths and offerings of our program.

Our program does not employ a set of formal "cut-offs" with regard to any of the quantitative application elements (e.g., GRE scores or undergraduate/graduate GPA). Often a strong record in one area may make up for a weakness in another area. Applicants interested in information on the qualifications of admitted students should consult the student summary data ([www.uwyo.edu/psychology](http://www.uwyo.edu/psychology)).

## Program Specific Graduate Assistantships

Applicants are considered for graduate assistantships at the time of admission. Graduate students typically receive some departmental financial support for the first four years.

## Program Specific Degree Requirements

### Master's Programs Plan A (thesis)

In addition to the general requirements specified in this *Catalog*, the following are required: (1) successful completion and oral defense of a thesis; (2) PSYC 5060. Statistical Methods in Psychology – 3 hours or STAT 5050. Statistical Methods in Biological Science – 3 hours; PSYC 5300. Applied Multivariate

Analysis – 3 hours or STAT 5055. Statistical Methods for Biologists II – 3 hours; PSYC 5520. Research Design in Psychology – 3 hours; (3) at least 9 hours in 5000-level courses exclusive of those listed above and exclusive of research and thesis research credit.

A minimum of 30 semester hours is required (26 coursework hours and 4 thesis hours).

## Doctoral Programs

### *Doctor of Philosophy in Clinical Psychology*

Students complete a four-year, on-campus sequence of required courses covering core areas of psychology and clinical competency. In addition, the following are required: successful completion of a thesis, a preliminary comprehensive examination, a dissertation, two summer clerkships, and a full year APA accredited internship.

### *Doctor of Philosophy in Social Psychology, Cognition/Cognitive Development, or Psychology and Law*

Students complete course requirements in topics designated as core areas of psychology, a preliminary comprehensive examination, and a research-based dissertation.

## Psychology (PSYC)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**1000. General Psychology. 3. [CS♦H]** Surveys the field of psychology through lectures, class discussion and assigned readings. Includes development of behavior, physiological mechanisms of behavior, perception, motivation and emotion, learning, intelligence, individuality and personality and mental health.

**1001. Issues in Psychology. 1. [I,L♦(none)]** Students debate and analyze controversial topics confronting psychologists, thereby gaining a better understanding of the varieties of work done by psychologists, as well as a better understanding of the methods psychologists use to advance the state of knowledge in the field. *Prerequisite:* PSYC 1000 or concurrent enrollment.

**2000. Research Psychological Methods. 4. [WB♦(none)]** Introduces some of the methods of investigating psychological questions. Exposure to various research strategies ranging from observational to experimental, using representative laboratory exercises, lectures, readings, films and demonstrations. Requires written and oral reports. May be used to satisfy

department's written and oral communication requirement for majors. Laboratory two hours per week. *Prerequisites:* PSYC 1000, ENGL WA, STAT 2050 or 2070.

**2080. Biological Psychology. 3.** Introduces biological bases of behavior. Includes ethology and comparative behavior, psychobiological development, physiological and sensory mechanisms of behavior, and evolution and behavioral genetics. Presents basic structural and functional properties of the nervous system. *Prerequisites:* PSYC 1000 and general biology. (Normally offered fall semester)

**2210. Drugs and Behavior. 3.** Surveys drugs which affect behavior, emphasizing both psychotherapeutic agents and drugs with abuse potential. Includes brief introduction to the chemistry of the brain and how drugs may have their effects. Behavioral, social, historical and medical aspects of each major class of psychoactive drugs are discussed. *Prerequisite:* PSYC 1000.

**2220 [2200]. Infant Development. 3.** Examines aspects of development of the human organism in the first three years of life. Examines theories, research and issues relating to infant development. Includes motor, perceptual, physical, cognitive, emotional and social development. *Prerequisite:* PSYC 1000.

**2300. Developmental Psychology. 3.** Introduces psychological development, including age-related changes in thinking, emotion, and behavior. Major theories, methodologies, and empirical discoveries are surveyed in an exploration of developments beginning with conception, with emphasis on social, affective, and cognitive developments in childhood and infancy and their implications for policy and practice. *Prerequisite:* PSYC 1000. (Normally offered spring semester)

**2340 [4340]. Abnormal Psychology. 3.** Provides a general overview of abnormal behavior, emphasizing types, etiology and treatment methods. *Prerequisite:* PSYC 1000. (Normally offered spring semester)

**2380 [4755]. Social Psychology. 3.** Examines how peoples' thoughts, feelings, and behaviors are influenced by the presence of others. Course will cover a broad range of theories and research in social psychology. *Prerequisite:* PSYC 1000. (Normally offered fall semester)

**3120 [4120]. Cognitive Psychology. 3.** Deals with higher mental processes that are primarily unique to human beings from theoretical and research orientations. Emphasizes interrelationships between various cognitive processes and continuity of those processes with perceptual and non-cognitive activities. Discusses how information is processed and

remembered. *Prerequisite:* 6 hours in psychology including PSYC 1000. (Normally offered spring semester)

**3150. Moral Development. 3.** Students explore the vast psychological literature on moral development in affect, cognition and behavior from infancy to adulthood. Topics covered include major developmental theories, research methodologies, current scientific knowledge and its relationship to issues of cultural diversity, social policy and education. *Prerequisite:* PSYC 1000, junior/senior standing or consent of the instructor.

**3160 [4160]. Learning and Behavior. 3.** Learning focuses on how our experiences affect how we think, feel, and behave. Reviews major theoretical approaches to learning which derive from animal and human research. Discusses applications of learning principles to understanding current behavior, teaching and maintaining new behavior, and eliminating unwanted behavior. *Prerequisite:* 6 hours in psychology.

**3250. Health Psychology. 3.** Provides overview of growing partnership between psychology and health care, including history of psychology in health care; theoretical foundations of health and illness; intervention and research techniques; stress and high risk behaviors (e.g., substance abuse, eating behaviors, AIDS); psychology's contribution to improving outcomes and quality of life in chronic and life-threatening behaviors. Cross listed with NURS 3250. *Prerequisite:* PSYC 1000.

**3300. Gender Development. 3.** Examines the development of gender roles and sex differences. Incorporates developmental, clinical and social psychological perspectives. Includes examination of biological, social and cultural factors on gender development; conceptualizations of masculinity, femininity and androgyny; differences in play behavior in boys and girls; evaluation of psychological measurement and research regarding gender development and sex differences. Cross listed with WMST 3300. *Prerequisite:* PSYC 2300 or 4300 or FCSC 2121 or EDST 2450.

**4060. History and Systems of Psychology. 3.** Deals with history of the ideas that led to present science of psychology. Emphasizes the origins of modern psychology within the context of 19th century science. Discusses philosophical origins of modern psychology. *Prerequisite:* 9 hours in psychology.

**4070. Motivation. 3.** Studies motivation concerning both humans and non-human animals, emphasizing humans. Discusses the physiological basis of motivation in some detail. Considers emotion as primarily a motivational

state. Covers psychodynamic and personality factors with regard to the human. *Prerequisite:* 6 hours in psychology.

**4080. Physiological Psychology. 4.** [SB♦(none)] Examines physiological mechanisms of behavior, strongly emphasizing neural and hormonal processes. Includes fundamentals of neuroanatomy and evolution of the nervous system, basic neurophysiology, sensory and motor processes, as well as the physiology of emotion, motivation, learning and memory. Lecture three hours per week. Laboratory two hours per week. *Prerequisites:* 6 hours in psychology and LIFE 1000, 1003, or 1010 or an introductory zoology course.

**4150. Cognitive Development. 3.** Examines cognitive development from infancy through adolescence. Explores, through lecture, discussion and projects, major theories and current empirical research on cognitive development, as well as implications for social and educational policies concerning children. *Prerequisite:* 9 hours in psych., including child psychology course.

**4200. Sensation and Perception. 3.** Examines behavioral and physiological processes involved in sensation and perception. Discusses each of the sensory systems, emphasizing their physiology and role in perceptual processing. *Prerequisite:* 6 hours in psychology.

**4220. Psychopharmacology. 3.** [WC♦(none)] Studies behavioral and conscious effects of drugs and drug use in treatment of psychological disorders. *Prerequisite:* PSYC 2340. Dual listed with PSYC 5220.

**4250. Psychological Aspects of Chronic Illness. 3.** Investigates the impact of chronic physical illnesses on diagnosed children and adults, their families, and society. Emphasizes effects of illnesses on psychological adaptation and quality of life. Should be of particular interest to helping professionals and health care workers. *Prerequisites:* PSYC 1000 and 3250.

**4300. Adolescent Development. 3.** Examines the developmental changes that occur during adolescence. Considers physical and physiological growth; intellectual, cognitive, academic and vocational development, changes in attitudes, interests and activities; and development of interpersonal relationships. *Prerequisite:* PSYC 1000.

**4310. Developmental Psychopathology. 3.** Provides basic understanding of developmental psychopathology. Examines characteristics, etiology, assessment and treatment of psychological disorders in children including autism, mental retardation, anxiety, depression, attention, learning, and conduct problems. *Prerequisite:* PSYC 1000 and PSYC 2300 or FCSC 2121 or EDST 2450.

**4320. Intellectual Disability. 3.** Acquaints students with all aspects of intellectual disability including assessment, diagnosis and classification, etiology, and associated health and mental health difficulties. Prevention, educational and psychological intervention, family adaptation, and community involvement are also addressed. *Prerequisite:* PSYC 1000 and PSYC 2300 or 4300 or FCSC 2121 or EDST 2450.

**4350. Psychology of Adulthood. 3.** Examines theories and research on psychological development from early adulthood to the end of life, with special emphasis on positive development, successful aging, and methodological issues in the study of adult development. *Prerequisite:* PSYC 1000.

**4370. Criminal Psychopathology. 3.** Provides an overview of current theories and empirical evidence concerning relationship between psychological disorder and criminal behavior. Examines various clinical syndromes and their role in biological, social and psychological genesis of crime, as well as the concept of criminal responsibility. Cross listed with CRMJ 4370. *Prerequisite:* 6 hours in psychology.

**4380. Death and Dying. 3.** Designed to provide a comprehensive overview of the field of thanatology. Death is considered from both an individual and sociocultural perspective. Aims to provide solid ground in research, methods, and theory of end-of-life issues and to encourage contemplation of personal and professional applications of death studies. *Prerequisites:* PSYC 1000 and junior/senior standing.

**4390 [3390]. Personality Science. 3.** Examines the contemporary science in personality psychology, with a focus on the genetic, biological, social, cognitive, and affective variables which interact to influence individual differences and personality coherence. *Prerequisite:* PSYC 1000 and PSYC 2300 or PSYC 2340 or PSYC 2380.

**4400. Principles of Psychological Testing. 3.** Encompasses basic concepts, principles and procedures of psychological testing, with a lecture, discussion, laboratory project approach. Emphasizes nature and uses of test reliability, validity, norms and transformations, selecting and evaluating tests, test interpretation models and professional ethics in test use. Lecture three hours per week. *Prerequisites:* 12 hours in psychology and STAT 2050 or 2070.

**4500. Introduction to Clinical Psychology. 3.** Provides students with general introduction to clinical psychology as a subarea of psychology. Deals with the search for, and applications of, psychological principles and methods aimed at assessing and explaining unique or special problems of the individual,

group or family, assisting client(s) to function more meaningfully and effectively, and helping to prevent future problems. *Prerequisite:* 12 hours in psychology, including PSYC 2340.

**4730. Psychology and Law. 3.** Exposes students to the application of psychological principles to problems in law. Emphasizes the American trial system, correction systems and civil commitment. Cross listed with CRMJ 4730. *Prerequisite:* 12 hours in psychology.

**4740. Advanced Social Psychology. 3.** [WC♦(none)] Concentrates on critical assessment of interpersonal behavior. Students are expected to become familiar with data gathering, analysis and reporting procedures commonly used in contemporary social psychology. *Prerequisites:* PSYC 2000 and 2380.

**4760. Child Maltreatment. 3.** Lecture and seminar. Examines the phenomenon of child abuse and neglect. Includes an overview of attitudes towards and legal definitions of child maltreatment. Explores parental factors, contextual influences and developmental consequences of maltreatment. Relies heavily on current research in child abuse and neglect. Emphasizes policy implications. Cross listed with CRMJ 4760. *Prerequisite:* 6 hours in psychology.

**4820. Psychology of Human Sexuality. 3.** A clinical-personality orientation to psychological factors in the development and expression of human sexuality. Focuses on the individual: interactions of physiological factors with developmental influences and personality patterns that produce feelings, thoughts and behaviors associated with human sexuality. *Prerequisite:* PSYC 1000 and 2300 or FCSC 2121 or EDST 2450.

**4830. Senior Thesis. 3.** [WC♦(none)] Senior research project under faculty guidance and supervision. Faculty sponsorship must be obtained prior to registration. *Prerequisites:* senior standing, majors only, 27 hours in psychology, PSYC 2000.

**4850. Field Work in Psychology. 1-3 (Max. 6).** Provides opportunities to experience applied aspects of psychology in external settings through volunteering, teaching, and related activities. Type and location of experience and requirements for earning credit and for grading are determined with a sponsoring faculty person in the psychology department. An acceptable paper based on work completed may also be required. No credit is available for field work prior to registration for this course. Satisfactory/Unsatisfactory only. *Prerequisite:* consent of instructor required in advance.

**4855. Undergraduate Research in Psychology. 1-3 (Max. 6).** Provides new opportunities to assist in aspects of conducting basic

and applied psychological research with a sponsoring faculty person in the psychology department. Specific research activities and requirements for earning credit and for grading are determined with a sponsoring psychology faculty person. An acceptable paper based on work completed may also be required. No credit is available for research conducted prior to registration for this course. Satisfactory/Unsatisfactory only. *Prerequisite:* consent of instructor required in advance.

**4860. Seminar. 1-6 (Max. 6).** Small group meetings for extended discussions of particular topics in psychology, generally one topic for the entire semester. Students prepare thorough reports on an aspect of the topic and present this as basis for group discussion. Topics vary from semester to semester. There is no textbook for the seminar, but students are expected to make extensive use of the library. *Prerequisites:* 9 hours in psychology and consent of instructor.

**4960. Service-Learning in Psychology. 3.** Experience applied aspects of psychology in real world settings through volunteering. Recent research and other materials preparing students for their service will be discussed in class. After the volunteering experience, the students will prepare an academic paper integrating their practical experience with research and theory learned in class. Cross listed with SOWK 4960. *Prerequisites:* PSYC 1000 and consent of instructor required in advance.

**5060. Statistical Methods In Psychology. 3.** General statistical analyses and their application to psychology. Analysis of variance, regression and correlation methods are studied from a data analytic perspective, emphasizing the conceptual understanding of where and when these techniques should be used and the interpretation of their results. Available computer programs will be utilized. Credit cannot be earned in more than one of the following courses: STAT 2020, 3050, 5050, 5060, 5070, 5080. Cross listed with STAT 5060. *Prerequisite:* 1 course in statistics (all introductory courses except 2000).

**5095. Statistical Computation In Psychology. 1-3 (Max. 12).** Supervised problem-solving practice in statistical analysis is provided with regard to topics corresponding to those covered in a concurrent statistical analysis course. Statistical analysis topics vary. *Prerequisites:* graduate standing and instructor consent.

**5115. Interdisciplinary Early Childhood Seminar. 3.** Advanced professional course for students interested in current trends and issues in early childhood development. Interdisciplinary in nature, drawing from research in communication disorders, kinesiology and

health, elementary and early childhood education and special education, child and family studies, nursing, and psychology. Cross listed with FCSC, EDEC, NURS, HLED, SPPA 5115. *Prerequisite:* graduate status.

**5120. Neuropsychology of Human Behavior. 3.** Brain mechanisms involved in the expression and control of human behavior will be studied. Findings from classical neuropsychological studies and more recent clinical research investigations will be used in deriving explanations for the structural and physiological basis of normal and abnormal psychological processes. *Prerequisite:* 9 hours in psychology.

**5140. Personality Science. 3.** Examines contemporary scientific research and theory in personality. Surveys the biological, cognitive, affective, social, and interpersonal determinants of personality function with individual differences. A theoretical framework highlights the dynamic transactions between individuals and the sociocultural environment over the life course. *Prerequisite:* graduate standing in clinical or experimental psychology.

**5180. Advanced Developmental Psychology. 3.** Provides a graduate-level overview of development psychology, including current theories, issues, and research in both cognitive development and social development. *Prerequisite:* graduate standing.

**5210. Advanced Physiological Psychology. 3.** Examines the physiological bases of behavior beginning with a treatment of basic neuroanatomy, neurophysiology, and pharmacology. Discussion then proceeds to the physiological correlates of various behavioral states including sleep arousal, sensory processes, motor control, motivational systems, emotions, learning and memory. *Prerequisite:* 30 hours in psychology including PSYC 4080.

**5220. Psychopharmacology. 3.** Examines clinical psychopharmacology, the science and practice of using drugs to treat psychological disorders. Dual listed PSYC 4220. *Prerequisite:* graduate standing and consent of instructor.

**5230. Advanced Cognitive Psychology. 3.** Provides the graduate student with an understanding of theoretical and experimental approaches to the study of human cognitive processing. There is an emphasis on critical evaluation of current research in the area. *Prerequisite:* 30 hours in psychology including PSYC 3120.

**5270. Behaviorism. 3.** Acquaints the graduate student with behaviorist philosophy, the experimental analysis of behavior, and the application of behavioral technology to experimental, educational, and clinical problems. *Prerequisite:* 30 hours in psychology.

**5300. Applied Multivariate Analysis. 3.** The application of multivariate statistical methods in behavioral science research. Topics include multivariate regression, canonical correlation, discriminate analysis, factor analysis and multidimension scaling. A wide range of computer assistance is incorporated. Cross listed with STAT 5300. *Prerequisite:* STAT 5050.

**5320. Child and Family Therapy. 3.** Designed for graduate students in clinical psychology who already possess adequate background knowledge of child psychopathology and diagnostic skills. Emphasis is on theory and techniques of individual psychotherapy with children and on theories of family therapy. *Prerequisite:* PSYC 5500 and consent of instructor.

**5330. Introduction To Clinical Practicum. 1.** Provides an introduction to psychotherapy and to the Psychology Clinic for first year doctoral students by having them observe a therapy case in the Psychology Clinic and receive instruction from an advanced doctoral student as to therapeutic techniques and client dynamics. *Prerequisite:* admission to the doctoral program in clinical psychology and permission of instructor.

**5340. Introduction To Clinical Supervision. 1-4 (Max. 4).** Provides an introduction to the supervision of psychotherapy for advanced doctoral students by having them observe a therapy case in the Psychology Clinic with assigned first year doctoral students and then give instruction as to therapeutic techniques used by the therapist and to client dynamics. *Prerequisite:* admission to the doctoral program in clinical psychology and consent of instructor.

**5370. Graduate Seminar in Forensic Psychology. 3.** To provide graduate level training in forensic psychology for students pursuing careers in psychology, counseling and criminal justice. *Prerequisite:* 16 hours in psychology or consent of instructor.

**5375. Psychology/Law Proseminar. 1-10 (Max. 10).** The Psychology Law Proseminar exposes students to various areas of psychological research. Topics will vary each semester and students will be expected to be actively engaged in the proseminar activities. Students will be exposed to theoretical and applied research that has relevance to legal settings. *Prerequisites:* graduate standing in Psychology and permission of instructor.

**5380. Theories and Techniques of Psychotherapy. 3.** A course for entering clinical doctoral students. Major current psychotherapies are reviewed in terms of theoretical assumptions and related techniques. Required

of first-year students in the program. *Prerequisite:* admission to doctoral program in clinical psychology.

**5400. Clinical Assessment I. 3.** First semester of a three semester practicum course in psychological assessment at the doctoral level. During the semesters, extensive examination is made regarding the standardization, relevant application, and significant limitations of assessment techniques. A thorough grounding is interpretation, and communication of the results of psychological evaluation both in writing and in consultation with referral sources. Normally taken during the first year of the doctoral program. *Prerequisite:* restricted to doctoral students in clinical psychology.

**5410. Clinical Assessment II. 3.** Second semester of a full-year practicum course in psychological assessment at the doctoral level. *Prerequisite:* PSYC 5400.

**5420. Clinical Assessment III. 3.** Presents the clinical psychologist in training with an introduction to the clinical application of neuropsychological principles and various assessment tools. Includes the administration and interpretation of neuropsychological instruments and batteries, as well as the integration of more traditional assessment techniques with neuropsychological testing. *Prerequisite:* admission to the clinical psychology doctoral program and PSYC 5410.

**5425. Diagnostic Interviewing. 1.** Students review research on diagnostic interviews, practice basic interviewing skills and learn to administer the Structured Clinical Interview for DSM-IV (SCID-I) using training tapes, class discussion and role-play exercises. As time permits, other interviews used to assess personality disorders and specific diagnostic categories will be reviewed. *Prerequisite:* admission to the doctoral program in clinical psychology.

**5430. Clinical Neuropsychological Assessment. 3.** Present the clinical psychologist in training with an introduction to the clinical application of neuropsychological principles and various tools. Includes the administration and interpretation of neuropsychological instruments and batteries, as well as the integration of more traditional assessment techniques with neuropsychological testing. *Prerequisite:* admission to the clinical doctoral psychology program, PSYC 5400, 5410, and 5120.

**5440. Behavior Analysis and Therapy. 3.** A seminar in behavior analysis and therapy designed to acquaint the student with literature on radical behaviorism and behavior analysis and to develop skills in the use of techniques

based on learning principles. *Prerequisite:* admission to doctoral program in clinical psychology and consent of instructor.

**5450. Clinical Practicum. 1-4 (Max. 8).** Beginning clinical practicum course providing doctoral students in clinical psychology with supervised experience in individual psychotherapy. Psychodynamic, client-centered, and behavioral techniques are employed. Cases and theoretical issues discussed in weekly seminar. Individual supervision of students by clinical faculty. *Prerequisite:* admission to doctoral program in clinical psychology and consent of instructor.

**5460. Advanced Clinical Practicum. 1-12 (Max. 12).** Advanced clinical practicum course for students beyond their second year in the doctoral program in clinical psychology. Provides additional supervised experience in individual, family, child, and group therapy, as well as in psychological assessment. Experiences include case conceptualization, case management, and provision of direct services. *Prerequisite:* admission to doctoral program in clinical psychology, PSYC 5450, and consent of instructor.

**5470. Empirically Supported Psychotherapies. 3.** Students become familiar with the efficacy and effectiveness of important state-of-the-art treatments with a focus on treatments of mood and anxiety disorders. Course goals include gaining a critical understanding of the issues involved in identifying psychological treatments that work. *Prerequisite:* PSYC 5380; PSYC 5510.

**5500. Psychopathology I. 3.** Students will obtain research-based knowledge in developmental psychopathology via lectures, discussions, and student presentations. This course will cover disorders that usually begin in childhood and how these disorders manifest across the lifespan. The course will also cover disorders that begin later and how these disorders manifest in children and adolescents.

**5510. Psychopathology II. 3.** Students will obtain research-based knowledge of both descriptive and explanatory adult psychopathology. In addition to learning how adult mental disorders present, students will acquire a framework for understanding the multiple variables that interact over the lifespan to influence adult psychopathology.

**5515. Introduction to Scientist/Practitioner Training. 2.** Acquaints first-year clinical doctoral students with the science-practitioner model for the practice of clinical psychology. Emphasis is on integrating science and practice. Focus is also on the crucial role of the

scientist-practitioner in our emerging behavioral healthcare system. *Prerequisite:* entry into Clinical Doctoral Program.

**5520. Introduction To Research. 3.** Introduction to problems and issues in research methodology. Ongoing research directed by various faculty are used as paradigms for conceptualization of research problems. Students critically evaluate projects presented and begin planning for research leading to theses and dissertations. *Prerequisite:* graduate status in psychology.

**5530. Ethical Issues in the Practice of Psychology. 1 (Max 2).** Informs and sensitizes the student to ethical issues, precedents, practices, and legal issue in the practice of psychology and in research. *Prerequisite:* graduate standing in psychology.

**5550. Clinical Seminar. 1-3 (Max. 18).** Graduate level seminar in clinical psychology, the topic of which will vary from semester to semester. Emphasis is on providing students with an in-depth analysis of some specific area of clinical psychology. *Prerequisite:* admission to the doctoral program in clinical psychology.

**5630. Clinical Supervised Practicum I. 2.** The first semester of a one year practicum in clinical supervision for doctoral students in clinical psychology. Students supervise at least one 2nd or 3rd year clinical doctoral student, attend supervision team meetings, and may conduct group supervision and/or see clients as determined by team leader. *Prerequisites:* enrollment in doctoral program in clinical psychology.

**5640. Practicum in Clinical Supervision II. 2.** The second semester of a one year practicum in clinical supervision for doctoral students in clinical psychology. Students supervise at least one 2nd or 3rd year clinical doctoral student, attend supervision team meetings, and may conduct group supervision and/or see clients as determined by team leader. *Prerequisite:* enrollment in doctoral program in clinical psychology.

**5650. Theories of Social Psychology. 3.** Designed to give the student a thorough understanding of the theories and methodologies of contemporary Social Psychology. *Prerequisite:* 16 hours in psychology including PSYC 2380.

**5670. Group Theory and Process in Psychotherapy. 3.** Theory and practice of group psychotherapy. Enrollment requires that students be willing to learn from both objective research of experts and their own subjective experiences in the training-group lab experience. *Prerequisite:* consent of instructor.

**5685. Neurophysiology. 4.** Designed to investigate the structure and function of nervous systems, drawing information from both verte-



brate and invertebrate organisms. Topics such as sensory systems, motor coordination and central integrative mechanisms will be covered in addition to the basic neurophysiology of nerve cells. The laboratory complements the lecture sequence. *Prerequisite:* one course in physiology, chemistry, physics.

**5720. Advanced Social Development. 3.** Provides a graduate-level introduction to theory and empirical research on social development. Topics include emotional development, attachment, socialization, moral development, aggression, and social context. *Prerequisite:* graduate standing.

**5740. Internship in Clinical Psychology 1. (Max. 3).** Full-year, 40 hours per week assignment to a mental health or related agency having an established internship program. This placement must be approved by the Department of Psychology and include: (a) adequate supervision of the intern and (b) didactic and other educational experiences that supplement practicum work. Registration for fall, spring, and summer terms is required. *Prerequisite:* Completion of preliminary examination and dissertation proposal, department approval.

**5760. Graduate Seminar. 1-10 (Max. 18).** Topic varies from semester to semester. Emphasis is upon the preparation of reports on special topics in psychology and the presentation and discussion of these reports in the seminar situation. *Prerequisite:* 6 hours in psychology and consent of instructor.

**5775. Developmental Psychology Seminar. 1-3 (Max. 18).** Graduate level seminar in developmental psychology, the topic of which will vary from semester to semester. Emphasis is on providing student with an in-depth analysis of some specific area of developmental psychology. *Prerequisite:* consent of instructor.

**5780. Advanced Cognitive Development. 3.** Provides a comprehensive account of current views of cognitive development. Emphasis is given to alternative theoretical explanations for findings from empirical research. *Prerequisite:* graduate standing.

**5785. Social Psychology Seminar. 1-3 (Max. 18).** Graduate level seminar in social psychology, the topic of which will vary from semester to semester. Emphasis is on providing students with an in-depth analysis of some specific area of social psychology. *Prerequisite:* permission of instructor.

**5790. Clerkship in Clinical Psychology. 1-3 (Max. 9).** Provides practical clinical and administrative experience in institutional and community settings. Experience includes psychological assessment, group and individual therapy activities, participation in clinical and administrative staff conferences, consultation

to various departments and agencies within the institutional setting and in the community, training of professionals in psychological concepts and techniques, and participation in research. Experiences are located in various community, county, and state agencies primarily in the Rocky Mountain region. Successful completion of three clerkships is a required part of the doctoral program in clinical psychology. *Prerequisite:* enrollment in doctoral program in clinical psychology and assignment by department.

**5800. Research in General Psychology. 1-8 (Max. 24).** *Prerequisites:* consent of the instructor and graduate standing in the department.

**5810. Research in Experimental Psychology. 1-8 (Max. 24).** *Prerequisites:* consent of the instructor and graduate standing in the department.

**5820. Research in Social Psychology. 1-8 (Max. 24).** *Prerequisites:* consent of instructor and graduate standing in the department.

**5830. Research in Clinical Psychology. 1-8 (Max. 24).** *Prerequisites:* consent of the instructor and graduate standing in the department.

**5840. Research in Developmental Psychology. 1-8 (Max. 24).** *Prerequisites:* consent of the instructor and graduate standing in the department.

**5850. Research in Comparative Psychology. 1-8 (Max. 24).** *Prerequisites:* consent of the instructor and graduate standing in the department.

**5860. Research in Physiological Psychology. 1-8 (Max. 24).** *Prerequisites:* consent of the instructor and graduate standing in the department.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Students are expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Religious Studies

122 Ross Hall, 766-3204

FAX: (307) 766-2096

Web site: [www.uwyo.edu/relstds](http://www.uwyo.edu/relstds)

Email: [relstudies@uwyo.edu](mailto:relstudies@uwyo.edu)

Department Head: Kristine T. Utterback

### Professor:

**PAUL V. M. FLESHER**, B.A. University of Rochester 1979; M.Phil. Oxford University 1982; Ph.D. Brown University 1988; Professor of Religious Studies 2012, 1993.

### Associate Professors:

**ALI H. RADDAOUI**, B.A. Ecole Normale Supérieure, Tunis, Tunisia 1981; M.A. Indiana University of Bloomington 1985; Ph.D. Indiana University of Bloomington 1988; Associate Professor of Religious Studies and Global and Area Studies 2010.

**KRISTINE T. UTTERBACK**, B.A. Bowling Green State University 1972; M.M. University of Wisconsin 1977; M.A. 1977; M.A. University of Toronto 1979; Ph.D. Center for Medieval Studies, University of Toronto 1985; Associate Professor of Religious Studies 2008, 1986.

### Assistant Professors:

**ANTOINETTE E. DENAPOLI**, B.A. University of South Florida 1996; M.A. Florida State University 2000; Ph.D. Emory University 2009; Assistant Professor of Religious Studies 2010.

### Academic Professional Lecturer:

**TYLER S. FALL**, B.A. Mary Washington College 1999; M.A. University of Oregon 2004; M.F.A. University of Wyoming 2009; Assistant Academic Professional Lecturer of Religious Studies 2012.

**MARY L. KELLER**, B.A. Williams College 1987; M.A. Syracuse University 1992; Ph.D. 1999; Assistant Academic Professional of Religious Studies 2012.

**SETH WARD**, B.A. Yale University 1974; M.A. 1978; M.Phil. 1979; Ph.D. 1984; Associate Academic Professional of Religious Studies 2011, 2003.

**Adjunct Faculty:**

**ERIN ABRAHAM**, B.A. University of Wyoming 2004; M.A. 2007; Ph.D. Saint Louis University 2011; Assistant Academic Professional Lecturer of Honors Program 2011; Adjunct Assistant Academic Professional Lecturer of Religious Studies 2015.

**MICHAEL C. BROSE**, B.S. Seattle Pacific University 1978; M.Sc. University of British Columbia 1985; M.A. University of Washington 1991; Ph.D. University of Pennsylvania 2000; Associate Professor of History 2006, 2000; Adjunct Associate Professor of Religious Studies 2015.

**JOHN MITTELSTAEDT**, B.A. Saint Olaf College 1986; M.T.S. Harvard University 1989; Ph.D. University of Iowa 1995; Professor of Marketing 2011; Adjunct Professor of Religious Studies 2015.

**ERIC W. NYE**, B.A. St. Olaf College 1974; M.A. University of Chicago 1976; Ph.D. 1983; Associate Professor of English 1989, 1983; Adjunct Associate Professor of Religious Studies 2015.

**SALLY L. PALMER**, B.A. The Colorado College 1966; Ph.D. Rutgers University 1971; M.Div. The Iliff School of Theology 1977; Adjunct Lecturer of Religious Studies 2010.

**KERRY PIMBLOTT**, B.A. Kings College London 2005; Ph.D. University of Illinois at Urbana Champaign 2012; Assistant Professor of African American and Diaspora Studies and History 2014; Adjunct Assistant Professor of Religious Studies 2015.

**Professor Emerita:**

Gladys M. Crane

Throughout history, religion has played an important role in shaping cultures and societies. Religious beliefs have inspired armies in their wars and leaders in their decisions. Religions have provided the foundation for ethical behavior and in many societies have been the primary source of education. In today's world, religions remain important, influencing our responses to 9/11, the Arab Spring, the Middle East crisis, and other events in regions around the world. Even in our own secular United States, religions and their beliefs play a major role in our debates over public policy.

The Religious Studies department offers a range of courses in the academic study of religions. These courses seek to acquaint students with religious beliefs and behavior, helping them to understand the ability of religions to define the world in which their adherents live and the power religions have to influence the behavior of their followers. Religious Studies courses cover a broad range of religions, both

modern and historical. Some courses focus on understanding a single religion in a limited time period, while others compare aspects of different religions. Yet further courses focus on religious expression, studying how religious beliefs are depicted in literature, film, art and music. Many of these courses are offered by the Religious Studies department, while others can be found in various departments, including anthropology, art, English, history and sociology.

**Undergraduate Major**

A major in Religious Studies requires 33 hours (11 courses).

For students completing their degree under the 2003 University Studies Program:

**Two required courses (6 hours):**

- 1) RELI 1000, Introduction to Religion.
- 2) RELI 4000, Theories of Religion.

**Primary Concentration (9 hours):**

Students should acquire a focused concentration by taking three courses (1) on a single religion, or (2) on the religions of particular region or culture. Courses may be from a limited time period or spread across history. Students may choose from established concentrations or create their own concentration in consultation with their adviser. [Six hours must be above 3000.]

**Secondary Concentration (6 hours):**

Students should take two courses in a religion, region, or culture differing significantly from that of the concentration. [Three hours must be above 3000.]

**Electives (12 hours):**

Four courses in Religious Studies (see note 2 below) chosen in accordance with the student's interests. [Six hours must be above 3000.]

For students completing their degree under the 2015 University Studies Program:

**Two required courses (6 hours):**

- 1) RELI 1000, Introduction to Religion.
- 2) RELI 4000, Theories of Religion.

**First Concentration (9 hours):**

Students should acquire a focused concentration by taking three courses (1) on a single religion, or (2) on the religions of a particular region or culture. Courses may be from a limited time period or spread across history. Students may choose from established con-

centrations or create their own concentration in consultation with their adviser. [Six hours must be above 3000-level.]

**Second Concentration (9 hours):**

Students should take three courses in a religion, region, or culture differing significantly from that of the first concentration. [Six hours must be above 3000-level.]

**Electives**

Three courses in Religious Studies (see note 2 below) chosen in accordance with the student's interests. [Six hours must be above 3000-level.]

**Language**

Students should take three semesters of a single foreign language or demonstrate equivalent proficiency. See note 3 below.

**For all Religious Studies Majors:****Honors**

If a student wishes to pursue an Honors designation in Religious Studies, two additional requirements must be fulfilled.

A) A three-hour Thesis Seminar or Internship, during which a research paper is written, or other suitable research project is carried out.

B) Demonstration of competency in a foreign language equivalent to a fourth-semester college-level course.

**Notes:**

1. If students majoring in Religious Studies can use its courses to satisfy requirements in a second major or minor, this is permitted.
2. Courses for the major should be drawn from those with a RELI prefix, or from a list of approved courses taught by other departments or programs. See the list of approved courses on the Religious Studies website. In each of the concentrations, only one course may be from outside RELI offerings. Two such courses may be used as electives. Occasionally, courses on religion are taught by outside departments as one-time opportunities. Students may propose these for inclusion in the major to the director of the Religious Studies department.
3. The language requirement may be satisfied with American Sign Language (ASL) or, with the approval of the department, coursework in another form of non-English communication (e.g. computer science, statistics, music composition).

- All courses must be passed with a grade of C or better.

## Undergraduate Minor

The Minor in Religious Studies requires eighteen hours of relevant courses, all with a grade of "C" or higher. These should consist of courses as set out below:

- RELI 1000, Introduction to Religion
- RELI 4000, Theories of Religion, a capstone course.
- Twelve hours of courses focusing on issues in the study of religions, nine of which should be at the 3000 level or higher. See note 2.

## Graduate Study

At present, no program for a graduate degree in religious studies is offered; however, some courses may be counted at the graduate level.

## Religion (RELI)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◆Q]).

**1000. Introduction to Religion. 3. [CH,G◆H]** Introduces world religions and shared characteristics. Draws on various academic approaches to religion study, emphasizing similarities and differences among wide variety of religions.

**1100. Worlds of Religion. 3. [I◆(none)]** Introduces first-year students to a variety of religious views and practices, events and applications to lead students to an understanding of the wide range of possible ways that religions take shape around the world and how they impact views of the arts, science, social justice and ethical norms.

**1101. First-Year Seminar. 3. [(none)◆FYS]**

**2040. Religions of the Middle East: Judaism, Christianity and Islam. 3.[CH,G◆(none)]** Analyzes origins and early years of three major religions that arose in the Middle East: Judaism, Christianity and Islam. Looks at historical development, political and cultural context, and structure of each religion.

**2050. Religions of Asia. 3. [CH,G◆H]** Introduces students to the religions of Asia. Primary focus on Hinduism and Buddhism, but also addresses several smaller religions. Emphasis on beliefs, sacred texts and tales, practices, ethics and worship, as well as historical development and contemporary issues.

**2060. Nature and Spirit. 3.** Examines classical principles of Christian theology in light of contemporary ecological issues. Focuses on how Christian thinkers have addressed the question of the relationship between humans, God and nature.

**2070. Gender and Religion. 3.** Aims at understanding how religion constructs and reinforces gender roles in religion and society. Looks at traditional gender roles in Christianity and the transformation they have undergone in the past century or so. Cross listed with WMST 2070.

**2080. Holocaust. 3. [CH◆(none)]** Surveys the destruction of European Jewry, 1933-1945. Cross listed with HIST 2080. *Prerequisite:* HIST 1120.

**2110 [1010]. Introduction to the Old Testament. 3. [CH◆(none)]** Introduces students to the books of the Old Testament and people whose way of life they describe. Pays particular attention to religion of the Israelites, their history and culture. Focuses on different historical circumstances in which the books were written.

**2150. New Testament Survey. 3.** Introduces academic study of the New Testament. Focuses on questions of history, religious and cultural context, occasion and purpose for writing the different books and theological development of early Christianity.

**2175. The Life and Teaching of Jesus. 3.** Explores life and teachings of Jesus within religious, cultural and political context of first-century Palestine. Studies Jewish, Greek and Roman influences on Palestine; then, examines effect of those influences on the gospels (both canonical and non-canonical).

**2200. Contemporary American Religion. 3. [CH,D◆COM2]** The U.S. is home to more world religions and to more versions of those religions than any other nation on the planet. This course examines how the U.S. has shaped these religions and the impact these religions have had in turn on U.S. society and culture.

**2225. History of Christianity. 3.** Traces Christianity from its beginnings to late 20th century. Cross listed with HIST 2225.

**2250. American Religious History I (To 1865). 3. [CH,D◆(none)]** Traces the history of religion in America through the Civil War. We will pay particular attention to the intertwining of religion and colonialism; the tension between emerging Protestant hegemony and religious pluralism; and the roles religion has played in justifying oppression and pursuing liberty in American history. Cross listed with HIST 2250.

**2252. American Religious History II (1865-1945). 3. [CH,D◆(none)]** Traces American religious history from the Civil War through WWII. Focuses on how race/ethnicity, class, gender, and national origin affected religion, and explores how Americans used religion in oppressing and liberating people; marking and erasing difference; and exporting values abroad as well as reforming society at home. Cross listed with HIST 2252.

**2255. Introduction to Judaism. 3.** Descriptively analyzes Judaism. Initially focuses on history of Judaism from its origins in Ancient Israel to modern period. Then it studies the religion itself, analyzing its beliefs and practices and how they influence Judaism's adherents.

**2315. History of Non-Western Religions. 3. [CH,G◆H]** Introduces students to religions outside the Judeo-Christian realm familiar in the west. Each religion analyzed in its world views, its ways of life, and in its social organization. History of each religion and its changes. Cross listed with HIST 2315.

**2320. History of Islam. 3. [CH,G◆COM2]** Focuses on the origins of Islam and its early formation, its growth and spread across the world, and its intellectual, spiritual and historical character. Time will also be spent on the formation of Islam in the modern world and how that impacts the views and actions of its members. Cross listed with HIST 2320.

**2330. Islam in the Modern World. 3. [(none)◆H]** How does Islam interact with Modernity? This course extends beyond the news to study contemporary trends and movements among the world's Muslims. Includes a general introduction to the history and religion of Islam, and discusses contemporary Islamic topics, reflecting current issues, instructor research and student choices.

**2410. Varieties of Non-Belief in the Western World. 3. [CH◆(none)]** A broad, chronological survey of different types of non-belief, primarily from the Renaissance onwards. It examines critiques by philosophers, politicians, poets, and novelists aiming to understand their objections to religion and analyzing how these objections shaped the modern religious landscape and the way we understand religion itself.

**2450. Traditional African Religion. 3. [CH,G◆COM2]** Surveys traditional African religions, both ancient and contemporary. Cross listed with AAST 2450.

**2500. Special Topics in Religion. 1-3 (Max. 6).** Permits occasional investigation of different subjects in academic study of religion.

**3090. Middle East and Isreal in Film. 3. [(none)◆H]** Focus on film representations of Isreal, the Arab world, Turkey and Iran. Studies religion and society, common human

aspirations, modalities of social and other conflicts through screening of feature and short films and discusses issues raised by historical, political, social, cultural and religious tensions and considerations in this region. *Prerequisite:* WA or COM1.

**3110. Bible and Archaeology. 3.** An archaeological survey illuminating the historical, theological, and cultural landscape of ancient Near East and the Mediterranean world. Examines how archaeology contributes to the understanding of the peoples, texts and religious movements of the Old Testament/Hebrew Bible and the New Testament. *Prerequisites:* RELI 1000 or RELI 2110 or RELI 2150 or ANTH 1300 or ANTH 1450.

**3150. Feminist Christian Thought. 3.** In recent decades Christianity has undergone important changes with regard to the place of women in the church. Addresses historical and theological discussions that have accompanied those changes. Also addresses how feminism and religion affect one's belief system. Cross listed with WMST 3150. *Prerequisites:* junior standing and at least one course in women's studies or religious studies.

**3180. Drama and Religion. 3.** Drama and religion seek to communicate ideas about the ultimate meaning of human life. Both influence and are influenced by the culture from which they developed. Examines plays that are influenced by the Bible, Greek plays whose concepts have influenced Christianity over the centuries, and modern plays that address religious issues. Cross listed with THEA 3180. *Prerequisite:* junior standing.

**3200. Religion and American Culture. 3.** Explores the role of religion in the history of American culture. It considers how developments in American religious history have reflected larger trends in American society, and how those developments have in turn helped shape American society and culture. *Prerequisite:* one lower-level course in religious studies, American history, or American studies.

**3220. History of the Modern Middle East. 3. [G♦(none)]** Surveys the Middle East from 1700 to the present. Emphasizes the demise of the Ottoman Empire, the rise of domination by European colonial powers, transformations in political, social, religious and cultural life, the rise of nationalist movements, the influence of oil, the growth of Islamist political groups and the Israeli-Palestinian conflict. Cross listed with HIST 3220. *Prerequisite:* 6 hours in history, religious studies or international studies.

**3225. Apocalypse: The History of the End. 3.** The apocalyptic End of Time has become the subject of much speculation, especially

since the beginning of the new millennium. Analyzes such speculation as a religious phenomenon in both ancient and modern religions, and attempts to understand its social, cultural and personal impacts. *Prerequisite:* junior standing.

**3230. Early Christianity. 3.** Considers the development of the Christian religion from a small Jewish sect to its place as the official religion of the Roman Empire and beyond. It examines the development of creeds, doctrines and institutions, placing them within their historical context. *Prerequisite:* RELI 1000, RELI/HIST 2225, or HIST 2113.

**3235. Medieval Christianity. 3.** Traces the development of 'Christendom' in Europe between about 500 - 1500 CE, concentrating on the Latin West. It examines the growth of Christian institutions and practices, the Church's role as sole governing entity, along with conflicts with secular governments as they developed in later centuries. Cross listed with HIST 3235. *Prerequisites:* RELI/HIST 2225, HIST 1110, or RELI 1000.

**3240. Reformation and Enlightenment Christianity. 3.** The years between about 1500 and 1800 saw the permanent dismantling of Christianity in the West as a unified force, as Protestantism brought new ways of viewing the relationship between God and humanity. Once the fragmentation began, it accelerated rapidly as Enlightenment thinking challenged Christianity in new and complex ways. Cross listed with: HIST 3240. *Prerequisites:* RELI 1000, RELI/HIST 2225.

**3245. Christianity Since Darwin. 3. [(none)♦♦COM2]** Christianity has faced many challenges since the mid-nineteenth century, including the thought of Darwin, Marx and Freud, to name a few. Christianity has faced those challenges in various ways and its practitioners continue to re-examine its understandings of a vastly changed and continually changing world. *Prerequisites:* COM1, and RELI 1000 or RELI/HIST 2225 or HIST 1120 or consent of instructor.

**3260. African Spirits in the New World. 3. [CH,G♦(none)]** Begins with Yoruba roots in Africa and travels with the African Diaspora focusing on spirit possession in Haitian Vodou, Cuban Santeria, Jamaican Revival Zion, Jamaican Rastafarianism, Brazilian Candomblé, and "Black Church" in the United States using ethnography and postcolonial theory of religious studies. Cross listed with AAST 3260. *Prerequisites:* AAST 1000 or any AAST 2000 level course or RELI 1000.

**3275. World Christianities. 3. [CH,G♦(none)]** Examines the development of Christianity primarily in Africa, Asia and South America. Cross listed with HIST 3275. *Prerequisites:* WB and CH.

**3320. Eastern Thought. 3.** Surveys some of the major concepts in Zen, Hinduism, Buddhism, Taoism and Confucianism. Cross listed with PHIL 3320. *Prerequisite:* 3 hours of philosophy.

**3340. Mysticism, Yoga, and Enlightenment in the East. 3.** Explores Hindu and Buddhist concepts of enlightenment and the means for reaching them through mysticism and yoga. Study the texts and beliefs and their translation into practice. *Prerequisites:* WB and CH.

**3344. The Divine Personality in Eastern Religions. 3.** Explores divine personality characteristics envisioned in Hinduism and Buddhism and the understandings of human nature, values, and beliefs. How should humans imitate the gods? *Prerequisites:* WB and CH.

**3350. Religion and Globalization in India. 3.** Learn about religious pluralism in India. In particular, how globalization has impacted the ways people from many different religions, caste, class, and educational backgrounds, ethnicities, and regions experience and practice their religions in 21st century India. *Prerequisites:* RELI 1000 or RELI 2050.

**3400. Religion in the American West. 3. [CH,D♦(none)]** Considers the religious history of the American West from Pre-Columbian times to the present, paying special attention to the ways the West affects religious belief and practice. Themes of contact and conflict will be particularly important in our study, as will the changing perceptions of the West. *Prerequisite:* USP WB course.

**4000. Theories of Religion. 3. [WC♦COM3]** Investigates different theories proposed to explain religion and methods used to investigate them. Pays primary attention to influential thinkers and theorists of the past century. *Prerequisite:* RELI 1000, and 12 additional hours in Religious Studies, at least 6 of which must be at the 3000-level or above, junior standing.

**4090. Film and Religion. 3.** Movies use religion to convey messages; they debate religious issues and use religion to debate non-religious issues. This course analyzes how film makers use religion and religious themes to transform religions into advocates for social issues and to shape religion's role in society. Popular films drawn from many genres. Cross listed with ENGL 4090. *Prerequisite:* 6 hours of 2000-level or higher literature courses or religion courses.

**4100. African American Religious Culture.**

**3. [WC,D♦(none)]** This mid-level writing-intensive seminar is a comparative study of African American religious celebration, primarily in the context of Afro-Christianity, but touching on Islam, Candomblé, “Voodoo,” Santería, and Rastafarianism. Cross listed with AAST 4100. *Prerequisite:* WB and one of the following: AAST 1000 or any AAST 2000-level course or RELI 1000.

**4113. Medieval Religious Dissent. 3.** Religious dissent in the Middle Ages included what might be called heresy, but also encompasses such marginal groups as Jews and witches. Examines development of orthodoxy and persecution of religious diversity between eleventh and 16th centuries within the historical context of the times. Cross listed with HIST 4113. *Prerequisite:* HIST 1110, 4100 or 4110.

**4150. Christians, Jews and Muslims in Iberia. 3.** Focuses on how, from the Middle Ages to the 20<sup>th</sup> century, these three religions have interacted and influenced each other and Iberian culture in general. Readings from numerous figures, from Maimonides to Goytisolo. *Prerequisite:* junior/senior standing. No knowledge of Spanish or Portuguese is required.

**4160. Moses, Jesus, and Muhammad. 3. [CH♦(none)]** Examines the biographies of Moses, Jesus and Muhammad found in works of history, in sacred literature, in hagiography, ritual and popular culture. Demonstrates strategies used to recover their historical personalities and how they are portrayed in multiple religious traditions, offering insights into how each have shaped our world. *Prerequisite:* RELI 1000 or junior standing.

**4174. Judaism from Ezra to Jesus. 3.** This course focuses on the religious and historical development of Judaism during the centuries between the end of the Old Testament and the New Testament, studying the arrival of Greek and then Roman culture and the changes Judaism underwent during that time that endure today. Cross listed with HIST 4174. *Prerequisites:* WB or COM2, and RELI 1000 or RELI 2110.

**4175. Judaism at the Dawn of Christianity. 3.** Judaism is the only Mediterranean religion that was practiced in the ancient world as well as in Late Antiquity and beyond. This course helps students analyze how Judaism was able to change and adapt at key moments to provide its adherents with an active, living religion that addressed their needs. Cross listed with HIST 4175. *Prerequisites:* RELI 1000 or RELI 2110, and junior standing.

**4190. Women and the Bible. 3.** Explores depictions, roles and statuses of women found in the Bible, both Old and New Testaments.

Introduces ways biblical portraits of women have been used in recent centuries to develop theologies of, by and for women. Cross listed with WMST 4190. *Prerequisite:* junior standing or permission of instructor.

**4260. Judaism in the Modern World. 3.** Studies Jews and Judaism from pre-modern period to present. Traces migration of Jews from Europe to the USA and Israel, while examining radical changes that transform the religion. *Prerequisite:* junior standing.

**4310. Seminar in Asian Religions. 3 (Max. 9).** Students will be introduced to a number of indigenous and analytical frameworks and interdisciplinary theories and methods in the examination of a specialized topic in the study of Asian religions. Specific focus of the course varies by semester. *Prerequisite:* RELI 2050 or junior standing.

**4335. Women and Islam. 3.** Examines women’s lives in Islamic societies from the seventh century to the present in the Middle East and throughout the world. Themes include women’s position in Islamic law, society and culture, Western images of Muslim women, veiling and Islamist movements, theoretical readings on power, gender and agency. Cross listed with HIST 4335 and WMST 4335. *Prerequisite:* 6 hours in women’s studies, international studies, religious studies, or history.

**4400. Internship in Religious Studies. 1-4 (Max. 4).** Application of the academic discipline of religious studies to work outside the university classroom. Students must meet with the Religious Studies internship director in advance to identify the internship’s components and grading criteria. Internships requiring a faith commitment on the intern’s part are not eligible for credit. Not to be used for graduate credit. *Prerequisites:* 12 hours of religious studies, including RELI 1000 and RELI 4000 or its equivalent; advanced standing as a religious studies minor; consent of internship director.

**4500. Special Topics in Religious Studies. 1-3 (Max. 12).** Presents from semester to semester a variety of important topics in the academic study of religion. *Prerequisite:* RELI 1000.

**4635. Religious Studies Departmental Honors. 0.** Satisfactory completion of this course indicates that Religious Studies Departmental Honors have been conferred on the student. Offered Satisfactory/Unsatisfactory only. *Prerequisites:* Consent of Religious Studies thesis chairperson; demonstration of competency in a foreign language equivalent to a fourth-semester college level or concurrent enrollment in a fourth-semester foreign language course.

**4900. Independent Study in Religion. 1-3 (Max. 6).** Primarily for juniors and seniors who can benefit from independent study of topics in religious studies not covered in course offerings. Guidance provided by faculty member in the appropriate field. *Prerequisites:* 9 hours in religious studies and consent of instructor.

**4930. Thesis. 0-6 (max. 9).** Directed research and writing supervision of Religious Studies thesis chairperson. Results in production of Religious Studies thesis. *Prerequisites:* Successful completion of or concurrent enrollment in RELI 4000, advanced undergraduate status in good academic standing, consent of Religious Studies thesis chairperson and department chair.

**4961. Domestic Field Course. 1-6 (Max. 12).** This course takes students away from campus to other locations in the United States to study religion on site in its geographic and cultural context. Destination and specific content varies, but the course always requires attention to the religious, racial, ethnic, and cultural diversity of religion in the United States. *Prerequisites:* Junior standing, WA or COM1.

## Science and Mathematics Teaching Center (SMTC)

453 Wyoming Hall, 766-6381

FAX: (307) 766-3792

Web site: smtc.uwyo.edu

Director: Jacqueline Leonard

Program Coordinator: Sylvia Parker

The Science and Mathematics Teaching Center (SMTC) is an intercollegiate, interdisciplinary program committed to excellence in science, mathematics, and technology education. Governed jointly by the Colleges of Education and Arts & Sciences, the SMTC, in cooperation with the Wyoming Department of Education and the Professional Teaching Standards Board (PTSB), serves as a science and mathematics education resource and professional development center for the state. The affiliate faculty for SMTC is comprised of faculty members from the College of Education, the College of Arts and Sciences, the College of Agriculture and Natural Resources, and the College of Engineering and Applied Science.

The SMTC provides extensive off-campus professional development that serves Wyoming communities, administrators, teachers, students and school districts. SMTC in-service and extension courses, workshops, institutes and conferences are provided with the principal purpose of improving science and mathematics teaching in Wyoming.

The SMTC offers two graduate degree program options: the Master of Science in Natural Science in Middle Level Math or Middle Level Science, designed for elementary, middle, and general science and mathematics teachers; and the Master of Science in Natural Science (Natural Science Education), designed for students that are completing the first year of their graduate program at Teton Science School.

Please see the SMTC section under the College of Education in this *Catalog* for course and graduate program information.

## Sociology

406 Ross Hall, 766-3342

FAX: (307) 766-3812

Web site: [www.uwyo.edu/Sociology](http://www.uwyo.edu/Sociology)

Department Head: Donna Barnes

### Professors:

**DONNA A. BARNES**, B.A. Louisiana State University 1975; M.A. University of Texas 1978; Ph.D. 1982; Professor of Sociology 2011, 1991.

**MALCOLM D. HOLMES**, B.A. University of Texas at El Paso 1974; M.A. 1976; Ph.D. University of Texas at Austin 1982; Professor of Sociology 1999, 1991.

**RICHARD S. MACHALEK**, B.S. Texas A&M University 1969; M.A. University of Texas 1972; Ph.D. 1975; Professor of Sociology 1988.

### Associate Professor:

**ANNA ZAJACOVA**, B.A. Hunter College (CUNY) 1999; M.S. Rutgers 2004; Ph.D. Princeton University 2006; Associate Professor of Sociology 2014, 2009.

### Assistant Professors:

**SHIRI NOY**, B.A. McGill University 2005; M.A. Indiana University 2007; Ph.D. 2013; Assistant Professor of Sociology 2013.

**MATTHEW A. PAINTER II**, B.A. Kansas State University 2003; M.A. Ohio State University 2005; Ph.D. 2010; Assistant Professor of Sociology 2010.

### Adjunct Professors:

Anatchkova, Inman

### Professors Emeriti

David Ashley, Audie Blevins, Gary Hampe, Quee-Young Kim

Sociology is the scientific study of group life and the investigation of the social causes and consequences of human behavior. This discipline occupies a central position in the social sciences and covers the full scope of social behaviors from intimate interactions between individuals to relationships among

entire societies. Most importantly, sociology invites students to analyze those features of social existence that we are most likely to take for granted. As such, sociological training imparts critical and analytical skills of great value in virtually all aspects of modern life.

Much of the applied knowledge employed in diverse fields such as communications, social work, business management, family life, health care, urban planning, government, education, religion and the administration of justice derives from basic sociological research. Consequently, sociological training provides an excellent background for occupations connected with these fields. In addition, an undergraduate degree in sociology prepares many students for advanced study in law, education, business, public administration, social work, pastoral work, health care and other professions.

The department provides a comprehensive sociology education both for students who elect to terminate their formal education with the B.A. and for those who plan to pursue advanced degrees in sociology or a related social science. Fundamentally, however, the department aspires to prepare students for informed participation in an increasingly complex world.

## Undergraduate Major

In addition to University and College requirements, the following are minimum requirements for the undergraduate major in sociology leading to the Bachelor of Arts degree.

Thirty-five credit hours are required to earn a major in sociology. These courses are listed below. This includes 14 hours of required Foundation Courses, 12 hours of Core Courses, and 9 hours of sociology elective courses. Of the 12 hours of required Core Courses, students must take one course each from any 4 of the 5 Core Course areas identified below. Grades of "C" or better must be earned in all 35 hours of coursework in order to be counted toward the major.

### Foundation Courses

SOC 1000.....	3
SOC 2070.....	4
SOC 3090.....	4
SOC 3900.....	3
<b>Total Hrs</b>	<b>14</b>

## Core Courses:

Complete four courses, one each in any four of the following five areas:

### Area A: Society and Inequality

SOC 2350.....	3
SOC 3500.....	3
SOC 4050.....	3
SOC 4160.....	3

### Area B: Social Organization and Processes

SOC 4020.....	3
SOC 4500.....	3
SOC 4650.....	3
SOC 4805.....	3

### Area C: Social Institutions

SOC 3200.....	3
SOC 3605.....	3
SOC 3880.....	3
SOC 3140.....	3
SOC 4350.....	3

### Area D: Individual and Society

SOC 2400.....	3
SOC 3110.....	3
SOC 3150.....	3
SOC 3400.....	3

### Area E: Global Comparative Sociology

SOC 3000.....	3
SOC 4110.....	3
SOC 4300.....	3
SOC 4370.....	3

**Total Required Hrs. 12**

## Elective courses:

Complete 9 additional hours of sociology courses. Electives may be used either to develop additional expertise in an area of interest or to broaden the student's sociological training.

**Total Elective Hrs. 9**

## Undergraduate Minor

The sociology minor requires a total of 18 sociology credits including SOC 1000. At least 9 of these 18 hours must be upper-division sociology credits.

Only grades of C or better can be counted toward the minor. Also, A&S students seeking a minor must have 12 credit hours exclusive to the minor and not counted toward their major.

## Honors in Sociology

Sociology majors with a 3.5 overall GPA, a 3.5 GPA in sociology courses and one 5000-level sociology course graduate with honors in sociology. The department also nominates students for membership in *Alpha Kappa Delta*, the international honorary society for sociology. Selection is based on academic excellence.

## Graduate Study

The Department of Sociology offers programs leading to the master of arts degree in sociology under Plan A.

### Program Specific Admission Requirements

Admission based on the university minimum requirements.

### Program Specific Graduate Assistantships

Graduate education allows students to acquire both teaching and research experience. Assistantships are available, upon application, to many incoming students and continued support is contingent on adequate progress in the program.

### Program Specific Degree Requirements

#### *Master of Arts in Sociology Plan A (thesis)*

To graduate with a master's degree in sociology, the student must complete a minimum of 26 hours of coursework.

The student is required to take Advanced Social Theory (SOC 5000), Statistical Methods for the Social Sciences (SOC 5070 - no other statistics course can be substituted), and Advanced Social Research Methods (SOC 5100).

The student must also take three elective sociology courses, as well as three additional elective courses that may be outside of the department. In addition, all graduate students must complete a thesis.

Credit for Practicum in College Teaching (SOC 5900) may not be included in the minimum number of course hours.

A minimum GPA of 3.0 is required for satisfactory progress in the program and graduation. Students must earn a grade of "B" or better in required classes.

Students whose undergraduate training in sociology does not include the prerequisites for the required graduate courses may correct the deficiencies by taking such undergraduate courses early in the graduate program. However, such work does not count toward graduation requirements.

Students also are required to write a master's thesis for which they receive a minimum of four hours of credit (SOC 5960). Before undertaking the thesis work, students must write and defend their thesis prospectus before a select faculty committee.

The department emphasizes both research skills that prepare the student for immediate job placement and broad academic work facilitating entrance to doctoral programs.

## Sociology (SOC)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

**1000. Sociological Principles. 3. [CS◀▶H]** Provides a survey of the discipline and foundation for other sociology courses. Explores major areas of interest — ranging from small groups and families to bureaucracies and social movements. Introduces significant concepts and theories, along with tools of social research. Gives attention to contemporary American society, as well as comparative and historical material.

**1100. Social Problems and Issues. 3. [I,L◀▶(none)]** Explores various approaches to defining and identifying social problems and applies basic sociological concepts and methods to analysis of selected social problems and issues.

**1350. American Indians in Contemporary Society. 3. [CS,D◀▶(none)]** Survey lecture course. Examines social and cultural issues and concerns of American Indians both on and off the reservations. Additionally, the status of American Indian people within the dominant society and culture are explored. Cross listed with AIST 1350.

**2070 [2000]. Introductory Statistics for the Social Sciences. 4. [QB◀▶(none)]** Presents central ideas of descriptive statistics and statistical inference, as applied to questions in social sciences. Includes graphs, averages, sampling, estimation, hypothesis-testing and relationships between variables. Introduces associated computer skills. Credit cannot be earned in more than one of STAT 2010, 2050, 2070, 4220, 5520. Cross listed with STAT 2070. *Prerequisites:* MATH 1000, 1400 or equivalent.

**2350. Race and Ethnic Relations. 3. [D◀▶(none)]** Examines social relations among majority and minority groups by devoting particular attention to race and ethnic relations in the U.S. Encompasses sociological approach to this topic, which emphasizes power structures, economic relationships and cultural traditions historically and today. Devotes attention to social psychological issues, such as prejudice, and social structural issues, such as class inequality. *Prerequisite:* SOC 1000.

**2400 [3300]. Criminology. 3.** Generally introduces the nature of crime, statistics on crime, types of criminal behavior and explanations of crime. Cross listed with CRMJ 2400. *Prerequisite:* SOC 1000 or equivalent.

**2890. Special Topics. 3.** Introduces students to some of the unique sociological interests of our faculty and instructors that fall outside of topics covered in our regular course curriculum.

**3000 [2100]. Social Change. 3. [G◀▶(none)]** Studies causes, processes and consequences of structural transformations in historical and comparative perspective. Reviews and assesses forces that account for sociological changes. Explores social change globally as well as in the U.S. Cross listed with INST 3000. *Prerequisite:* SOC 1000.

**3100. Chinese Society. 3. [G◀▶(none)]** Reviews origins and consequences of Chinese revolution in comparative and cultural perspectives. Discusses influence of historical traditions and social structure on individual lives and behavioral patterns. Cross listed with INST 3100. *Prerequisite:* SOC 1000.

**3110 [2110]. Self and Society. 3.** Considers social behavior at the micro level, emphasizing the influence of society on the individual's thoughts, emotions and behaviors. Topics such as the development of the self over the life course, the self in social interaction, and the role of attitudes and emotions in social interaction are discussed. *Prerequisite:* SOC 1000 or PSYC 1000.

**3140. [4100, 4140] Sociology of the Family. 3.** Two major themes of the course are change experienced by the family institution and the centrality of the family in America today. Subjects that are covered include: A brief history of the family in the U.S., kinship, family structure, mate-selection, marriage, divorce and socialization. *Prerequisite:* SOC 1000.

**3150. Collective Behavior and Social Movements. 3.** Analyzes and explains fads, fashions, rumors, riots and mass behavior in light of theoretical frameworks. Studies social movements including blacks, women, labor, religions and students. Assesses meaning of contemporary revolutionary movements in Third World countries against sociological interpretations of historic French, Russian and Chinese Revolutions. *Prerequisite:* SOC 1000 or equivalent.

**3200. Sociology of Religion. 3.** Introduces various ways sociologists interpret religion. Explores the nature of relationships between religion and society. *Prerequisite:* SOC 1000 or equivalent.

**3400 [4200]. Deviant Behavior. 3.** Examines theory and research relevant to understanding deviant behavior in general and specific types of individual and subcultural deviancy. Cross listed with CRMJ 3400. *Prerequisite:* SOC 1000 or equivalent.

**3500. Sociology of Gender. 3.** Explores gender through a cultural and structural approach. The cultural approach emphasizes the variability in social expectations for men and women across time and place; the structural approach analyzes the effect of social institutions such as family, government, education, and the economy of gender. *Prerequisites:* SOC 1000 and junior or senior standing.

**3550. Medical Sociology. 3.** Considers sociological contributions to diagnosis and treatment of illness. Studies social organization of health professions and agencies. *Prerequisite:* SOC 1000 or equivalent.

**3605. Sociology of Education. 3.** An introductory overview of the principal areas of inquiry in the field. Students learn relevant theories and concepts, principal methodological approaches as well as important current issues in education. Comparative analysis may focus on historical comparisons, national/global comparisons, U.S. regional, and/or variant educational systems at the local level. *Prerequisite:* SOC 1000 or equivalent.

**3880. Political Sociology. 3.** Study of political theory, political organization, political mobilization, the state, nation-building, national identity, post-nationalism, the relationship between the state and markets, historic formation of the nation-state, and the changing role of the state in a global context. *Prerequisite:* SOC 1000, and junior/senior standing.

**3900 [3700]. Sociological Theory. 3.** Examines the emergence and development of sociological theory in the writings of thinkers such as Marx, Durkheim, and Weber. Explores continuities and discontinuities between the classical period of sociological theory and contemporary schools such as functionalism, conflict theory, neo-Marxian theories, symbolic interactionism, phenomenology, and rational choice/exchange theory. *Prerequisite:* Nine credit hours of sociology.

**3950. Environmental Sociology. 3.** Explores how ecology, technology, politics, economics, and culture intersect. By analyzing key contemporary environmental debates, students will develop an understanding of sociological analyses, and the impact of social life on our environment, as well as the effect of the environment on social life. Topics covered include: the environmental movement; sustainable development; developing nations and their

environment; capitalism and technology; and environmental justice. Cross listed with ENR 3950. *Prerequisite:* SOC 1000.

**4020 [4560]. Sociology of Work. 3.** Examines social organization of work—especially in response to change in technology, demands for equal opportunity, size and goals of firms and desires for meaningful work. Historically and comparatively analyzes work-life experiences shaping of labor markets and role of collective action. Explores impact of the labor process on distribution of society's material and symbolic rewards. Dual listed with SOC 5020. *Prerequisite:* SOC 1000, MGT 3210 or ECON 1010.

**4050 [4000]. Social Inequality. 3.** Focuses on the structure and consequences of unequal access to political, economic and social benefits in the U.S. and the world. Critically examines institutional arrangements that perpetuate and are supported by inequality and stratification, as well as patterns of social mobility. Dual listed with SOC 5050. *Prerequisites:* SOC 1000 and junior standing.

**4095 [3090]. Sociological Research Methods. 4. [WC♦COM3]** Examine the design and conduct of social research. Students will complete a research prospectus, including formulating a sociological research question, developing hypotheses, conducting a literature review, surveying prospective data, speculating about potential findings, and discussing implications. This course satisfies the USP 2015 Communication 3 and USP 2003 WC requirements. *Prerequisites:* STAT/SOC 2070, junior standing in sociology major, completion of WB/COM2, and SOC 3900.

**4110. Sociology of International Development. 3. [WC,G♦COM3]** Surveys development studies and rural change, including case studies of deliberate change efforts toward industrialization. Includes peasant modes of food production, daily life in subsistence, agriculture, shifts to commercial agriculture and global economy, ethical and critical issues of induced change and different approaches to development process and outcomes. Cross listed with INST 4110. *Prerequisites:* SOC 1000 or ANTH 1200; SOC 3000 recommended.

**4160 [4150]. Sociology of Aging. 3.** The process of aging from the individual to the societal level is the focus of the course. Consequences of this process such as the increase in the number of elderly, retirement and health are examined from the major social institutions, the relationships between these institutions and American society as a whole. Dual listed with SOC 5160. *Prerequisite:* 6 hours of sociology (including SOC 1000) and at least junior standing.

**4300. The World System. 3.** Analyzes structure of political and economic interdependence among nation-states. Reviews and assesses theoretical approaches to explaining changing structure of inequality, power, war and peace. Dual listed with SOC 5300. Cross listed with POLS/INST 4300. *Prerequisite:* SOC 1000 or ANTH 1200 or equivalent political science, international studies, or social science course. (Normally offered once a year)

**4350. Sociology of Law. 3.** A consideration of sociological concepts such as inequality, stratification, social control and social change in an analysis of the law and legal institutions. Topics include: the role of the police, lawyers, judges, and juries; race, sex, age, and sexuality discrimination and civil rights; free speech, and toxic torts. Cross listed with CRMJ 4350; dual listed with SOC 5350.

*Prerequisites:* SOC 1000 and upper division status.

**4370. Global Political Economy. 3. [G♦(none)]** Examines the interaction of politics and the economy at the global level. Evaluates how political and economic decisions of one country or groups of countries affect institutions and life circumstances in others. Assesses the causes of consequences of globalization as rooted in political economy. Cross listed with INST 4370. *Prerequisites:* SOC 1000 and junior standing or SOC 3000.

**4440. Deviance and Social Control. 3.** In-depth examination of theory and research on the social construction and social control of deviance. Dual listed with SOC 5440. *Prerequisite:* 9 hours of SOC courses and upper division standing.

**4500. Sociology of Organizations. 3.** Complex organizations have been described as the dominant feature of modern societies. Organized on the basis of bureaucratic modes of administration, they dominate contemporary societal institutions, such as the economy, the polity, education, religion, and the military. This course investigates basic structures and processes of all types of complex organizations. *Prerequisites:* 6 hours of SOC including SOC 1000 and junior/senior or graduate student standing.

**4650. Urban Sociology. 3.** Considers growth of metropolis and its impact upon modern life. Dual listed with SOC 5650. *Prerequisite:* SOC 1000 and junior standing. (Offered based on sufficient demand and resources)

**4680. Shanghai: Past & Present. 3. [CS,G♦(none)]** Lectures, fieldtrips, and other cultural activities are all incorporated into the curriculum to help students learn



about the political, economic and cultural development in 21st century China. Cross listed with INST 4680.

**4700. Science and Modern Society. 3.** Leads students to consider how science is a social phenomenon in its practice and in its knowledge by examining the history, culture and methods in science. *Prerequisite:* 6 hours of social science.

**4805. Principles of Population. 3.** Considers population structure and demographic transition, with applications to topics such as global population growth, population aging, health, family, migration, urbanization, environment. Dual listed with SOC 5805. *Prerequisites:* SOC 1000 or equivalent and SOC 2070 or STAT 2070 or equivalent.

**4850. Conference. 1-6 (Max. 6).** Considers topics of current sociological interest in consultation with a faculty member. *Prerequisites:* senior standing and 15 hours of sociology.

**4890. Special Topics in\_\_\_\_. 1-3 (Max. 6).** Accommodates seminar series and/or course offering by visiting faculty whose subject matter is not included in other courses. *Prerequisites:* junior standing and consent of department.

**4900. Seminar. 3-6 (Max. 6).** Considers special topics of current sociological interest. May be repeated for maximum of 6 hours credit when topic of seminar is different. *Prerequisite:* consent of instructor.

**4970. Sociology Internship. 3.** Students gain practical experience in the application of principles learned in sociology courses. Students work with the internship coordinator to select a site and faculty supervisor; intern approximately six hours per week in the host organization; and complete readings and written assignments which reflect the student's work. Satisfactory/Unsatisfactory Only. *Prerequisites:* sociology major or minor with a minimum of junior standing and the completion of SOC 1000, and two additional sociology courses.

**5000. Advanced Sociological Theory. 3.** A consideration of the nature of theory and the major theoretical perspectives in sociology. *Prerequisite:* SOC 3900 or equivalent.

**5020. Sociology of Work. 3.** Examines social organization of work-especially in response to change in technology, demands for equal opportunity, size and goals of firms and desires for meaningful work. Historically and comparatively analyzes work-life experiences shaping of labor markets and role of collective action. Explores impact of the labor process on distribution of society's material and symbolic rewards. Dual listed with SOC 4020. *Prerequisite:* SOC 1000, MGT 3210 or ECON 1010.

**5050 [4000]. Social Inequality. 3.** Focuses on the structure and consequences of unequal access to political, economic and social benefits in the U.S. and the world. Critically examines institutional arrangements that perpetuate and are supported by inequality and stratification, as well as patterns of social mobility. Dual listed with SOC 4050.

**5070. Statistical Methods for the Social Sciences. 3.** General statistical analyses and their application to the social sciences. Analysis of variance, regression and correlation methods are studied from a data analytic perspective, emphasizing the conceptual understanding of where and when these techniques should be used and the interpretation of their results. Available computer programs are utilized. Credit cannot be earned in more than one of the following courses: STAT 2110, 3050, 5050, 5060, 5070, 5080. Cross listed with STAT 5070. *Prerequisite:* one course in statistics (all introductory courses except STAT 2000).

**5100. Advanced Social Research Methods. 3.** In-depth survey of research concepts and methods with emphasis on application that culminates in the designing and execution of a research project by the student. *Prerequisite:* SOC 5070 or equivalent.

**5140. The Family. 3.** Two major themes of the course are change experienced by the family institution and the centrality of the family in America today. Subjects that are covered include: A brief history of the family in the United States, kinship, family structure, mate-selection, marriage, divorce, and socialization. Dual listed with SOC 4140. *Prerequisite:* 6 hours in sociology including SOC 1000 and at least junior standing.

**5160. Sociology of Aging. 3.** The process of aging from the individual to the societal level is the focus of the course. Consequences of this process such as the increase in the number of elderly, retirement and health are examined for the major social institutions, the relationships between these institutions and American society as a whole. Dual listed with SOC 4160. *Prerequisite:* 6 hours of sociology including SOC 1000 and at least junior standing.

**5200. Conference. 1-8 (Max. 8).** Consideration of topics of current sociological interest in consultation with a member of the faculty. *Prerequisite:* consent of instructor.

**5250. Seminar. 3 (Max. 12).** Consideration of topics of sociological interest in the content of a graduate seminar. Cannot be dual-listed with any course below the 5000 level. May be repeated for credit when the topic of the seminar is different. *Prerequisite:* consent of instructor.

**5300. The World System. 3.** Analyzes structure of political and economic interdependence among nation-states. Reviews and assesses theoretical approaches to explaining changing structure of inequality, power, war and peace. Dual listed with SOC 4300 Cross listed with POLS/INST 5300. *Prerequisite:* SOC 1000 or ANTH 1200 or equivalent political science, international studies, or social science course.

**5350. Sociology of Law. 3.** A consideration of sociological concepts such as inequality, stratification, social control and social change in an analysis of the law and legal institutions. Topics include: the role of the police, lawyers, judges, and juries; race, sex, age, and sexuality discrimination and civil rights; free speech, and toxic torts. Cross listed with CRMJ 4350; dual listed with SOC 4350.

**5440. Deviance and Social Control. 3.** In-depth examination of theory and research on the social construction and social control of deviance. Dual listed with SOC 4440. *Prerequisite:* graduate standing.

**5540. Stratification and Inequality. 3.** In-depth survey of sociological theory and research on substantive issues such as social class structure, racial/ethnic relations, and gender stratification. *Prerequisite:* graduate standing.

**5650. Urban Sociology. 3.** Considers growth of metropolis and its impact on modern life. Dual listed with SOC 4650. *Prerequisite:* SOC 1000 or equivalent.

**5805. Principles of Population. 3.** Considers population structure and demographic transition, with applications to topics such as global population growth, population aging, health, family, migration, urbanization, environment. Dual listed with SOC 4805. *Prerequisites:* SOC 1000 or equivalent and SOC 2070 or STAT 2070 or equivalent.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 12).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** The course is designed to provide an enrichment experience in a variety of topics. Note: Credit in this course may not be included in a graduate program of study for degree purposes. Offered S/U only. *Prerequisite:* graduate standing.

**5960. Thesis Research. 1-12 (Max. 24).** Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose course-work is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Department of Statistics

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Department Head: Ken Gerow

### Professors:

**RICHARD ANDERSON-SPRECHER**, B.A. Carleton College 1974; M.A. University of Minnesota 1976; Ph.D. University of Iowa 1990; Professor of Statistics 2006, 1990.

**STEPHEN L. BIEBER**, B.S. University of California-Davis 1971; M.A. University of California-Berkeley 1977; Ph.D. 1979; Professor of Statistics 1990, 1979.

**KENNETH G. GEROW**, B.S. University of Guelph, Canada 1981; M.Sc. 1984; Ph.D. Cornell University 1992; Professor of Statistics 2007, 1993.

**BURKE GRANDJEAN**, B.A. Rice University 1971; M.A. University of Texas-Austin 1973; Ph.D. 1976; Professor of Statistics and Sociology 1990; Executive Director, WYSAC 2004.

**TIMOTHY J. ROBINSON**, B.S. James Madison University 1989; M.S. Virginia Polytechnic Institute and State University 1994; Ph.D. 1997; Professor of Statistics 2012.

### Associate Professors:

**SNEHALATA V. HUZURBAZAR**, B.A. Grinnell College 1984; M.A. Vanderbilt University 1988; Ph.D. Colorado State University 1992; Associate Professor of Statistics 2001, 1995.

**SHAUN S. WULFF**, B.S. Montana State University 1991; M.S. 1994; Ph.D. Oregon State University 1999; Associate Professor of Statistics 2005, 1999.

### Academic Professional Lecturer

**Scott Crawford**, B.S. Southern Utah University 2004; M.S. Brigham Young University 2006; Ph.D. Texas A&M University 2012; Academic Professional Lecturer 2012.

### Adjunct Professors:

Legg, L. McDonald, T. McDonald, Manly, Nychka, Sain

### Emeriti Faculty:

Robert S. Cochran

The curriculum in statistics includes a firm foundation in mathematics and computer science, in addition to course work in statistical theory and methodology. Statistics majors are also required to obtain a minor in an area of application. The nature of statistical work is to design and analyze research projects through the application of the principles of mathematics, computer science, and statistics. The student who wishes to make valid inferences from empirical data will find the field of statistics fascinating and rewarding.

The study of statistics as a separate professional field is comparatively recent. The wide demand for graduates with special training in research and development techniques has fostered development of statistical curricula in colleges and universities. A pioneer in this field, the University of Wyoming is one of the few schools in the nation where a coordinated undergraduate training program in statistics is available.

We expect that students graduating with a statistics degree will be able to: 1) recognize the importance of variation and uncertainty in the world, 2) understand how statistics improves decisions when faced with uncertainty, 3) become proficient with a broad range of statistical tools, 4) develop critical thinking skills that enable application of statistics in new and unusual settings, and 5) communicate effectively. With these skills, graduates will be able to work effectively as statistical professionals and, if desired, successfully pursue further training at the master's and doctorate levels.

Graduates with statistical training are employed in a broad spectrum of areas which include the business world, the sciences (social, biological, physical and health), as well as engineering and education. For this reason, an area of application is required of each student.

The statistics department also offers graduate programs leading to a minor in statistics, and to a Master of Science (Plan A, Plan B), and Doctor of Philosophy in statistics.

## Undergraduate Major

In addition to university and college requirements, requirements for statistics majors include:

A. Statistics	.....at least 30
2010/2050/2070/4220	.....3-4
2110/3050/5050/5060/5070/5080	.....3
4015, 4025, 4255, 4265	..... 12
Optional from 4045, 4070, 4115, 4155, 4300, 4350, 4360, 4370, 4460, 4880, 5320	.....9
Senior thesis 4870	.....3

B. Mathematics 2200, 2205, 2210, 2250	.....15
C. Computer science 1010 and 1030	.....6
D. Electives—chosen so that at least 42 hours are at the 3000/4000/5000 level	

**Total hours: at least 120**

## Typical Freshman Year for Statistics Majors

### Freshman Year: Fall

ECON 1010	.....3
ENGL 1010	.....3
MATH 2200	.....4
POLS 1000	.....3
Biological, physical or earth science	.....4
Physical Activity and Health requirement	....1
<b>Total Hrs.</b>	<b>18</b>

### Freshman Year: Spring

ECON 1020	.....3
University Studies	.....3
MATH 2205	.....4
STAT 2010/2050/2070/4220	.....3-4
Biological, physical, or earth science	.....4
<b>Total Hrs.</b>	<b>17-18</b>

**Note:** For several entry level courses such as STAT 2010, 2050, 2070 and 4220, a student cannot receive credit for more than one of these courses. The same is true for the second courses 2110, 3050 and 5050, 5060, 5070, 5080.

## Statistics Minor

*The following courses are required for a statistics minor:*

MATH 1400	.....3
STAT 2010/2050/2070/4220	.....3-4
STAT 3050	.....3

*And 9 additional hours from the following:*

STAT 4015	.....3
STAT 4025	.....3
STAT 4045	.....3
STAT 4070	.....3
STAT 4115	.....3
STAT 4155	.....3
STAT 4255	.....3
STAT 4265	.....3
STAT 4350	.....3
STAT 4360	.....3
STAT 4370	.....3
STAT 4300	.....3
STAT 5320	.....3

**Total Hrs. 18-19**

## Graduate Study

The Department of Statistics offers graduate programs leading to a minor in statistics, to a master of science in statistics (Plan B Option 2), to a master of science in applied statistics (Plan B Option 1), and to a doctor of philosophy in statistics. Students wishing to pursue a master of science in statistics with a thesis option

(Plan B), should contact the department directly. The minor is designed to enhance the M.S. or Ph.D. program of any student enrolled in one of the graduate programs at the University of Wyoming. All of these programs emphasize the understanding and application of a broad variety of statistical methods on real projects. Students will be provided with numerous opportunities to perform analyses and communicate findings. The M.S. and Ph.D. programs in statistics are grounded in statistical theory.

### Program Specific Admission Requirements

The prerequisite for admission to graduate study is an undergraduate degree from an accredited institution, including work in mathematics through calculus III, Linear Algebra and at least one second-level class in statistical methods. Prospective students are encouraged to have had Math Analysis and upper level introduction to probability and mathematical statistics. Test scores from the GRE and TOEFL exams are required. The minimum score for the TOEFL is 600 (100 Internet-based Test) or for IELTS minimum score is 6.0. Students who do not have prerequisites in mathematics and statistics may make up this deficiency at the beginning of their graduate program; however, such work does not count toward graduation requirements.

### Program Specific Degree Requirements

#### Minor

Twelve hours at the 4000 or 5000 level with the exception of STAT 4220, 5000, and 5185.

#### Master's Program

##### Plan B (Option 1)

##### Master of Science in Applied Statistics

#### Profile

The Master's Program in Applied Statistics will give the student an extensive and broad background in statistical methods, data analysis, and written and oral presentation skills. This degree is a terminal experience in graduate statistical education and should not be viewed as preparatory for entrance into a Ph.D. program in statistics. Graduates will have the necessary background to work as data management specialists, statistical analysts, and as project managers within a wide range of research organizations.

#### Coursework

In addition to the general requirements of the university all candidates for the MS (Plan B – Option 1) degree must successfully take and complete:

Required: 22 credit hours

- STAT 5015 Regression Analysis
- STAT 5025 Design and Analysis of Experiments
- STAT 5155 Fundamentals of Sampling
- STAT 5255 Mathematical Theory of Probability
- STAT 5265 Introduction to the Theory of Statistics
- STAT 5380 Bayesian Data Analysis
- STAT 5470 Data Analysis

Electives: a minimum of 15 credit hours in other acceptable graduate courses. Acceptable courses include statistics courses numbered 5000 or higher, excepting 5000, 5050, 5060, 5070, 5080, and 5185.

**Total: 37 credit hours**

Graduation Requirements: (1) successful completion of coursework and (2) a data analysis project (Plan B paper)

#### Plan B (Option 2)

##### Master of Science in Statistics

#### Profile

The Master's Program in Statistics will give the student a solid background in statistical theory and in statistical methods, and in technical reading and writing skills. Graduates will have the necessary background to further pursue the Ph.D. degree, to work in industrial or research organizations, or to teach in community college level institutions or as academic professionals in four-year-college and universities.

#### Coursework

In addition to the general requirements of the university all candidates for the MS (Plan B – Option 2) degree must successfully take and complete:

Required: 18 credit hours

- STAT 5210 Statistical Methods 1
- STAT 5220 Statistical Methods 2
- STAT 5380 Bayesian Data Analysis
- STAT 5510 Distribution Theory
- STAT 5520 Inference I

One course from the following: 3-4 credit hours

- STAT 5025 Design and Analysis of Experiments
- STAT 5230 Statistical Methods 3

Electives: a minimum of 15 credit hours in other acceptable graduate courses. Acceptable courses include statistics courses numbered 5000 or higher, excepting 5000, 5050, 5060, 5070, 5080, and 5185.

**Total: 36-37 Credit Hours**

Graduation Requirements: successful completion of coursework and a passing grade on a two-day qualifying examination (Plan B paper)

#### Doctoral Program

##### Program for a Doctor of Philosophy in Statistics

#### Profile

The Ph.D. Program in Statistics will give the student a solid background in statistical theory and in statistical methods, in technical reading and writing skills, and in conducting independent research. Most graduates from our doctoral program have been employed as tenure-track faculty at other universities; however, they also will have the necessary background to work as lead researchers in industrial and research organizations.

#### Coursework

In addition to the general requirements of the university all candidates for the PhD degree must successfully take and complete:

Required: 46 credit hours

- STAT 5210 Statistical Methods 1
- STAT 5220 Statistical Methods 2
- STAT 5230 Statistical Methods 3
- STAT 5380 Bayesian Data Analysis
- STAT 5510 Distribution Theory
- STAT 5520 Inference I
- STAT 5530 Inference II
- STAT 5540 Large Sample Theory
- STAT 5620 Theory of Linear Models
- STAT 5630 Multivariate Analysis
- STAT 5660 Computational Statistics
- STAT 5670 Mixed Models
- STAT 5680 Bayesian Statistics
- STAT 5810 Seminar (3 hours; 3 presentations)

Substitutions in the list of required courses are acceptable if listed courses are unavailable and the substitution is approved by the statistics department. The remaining 26 hours of doctoral work are typically filled in part by other graduate level statistics and mathematics courses. Students who enter the program lacking a course in Mathematical Analysis or the equivalent should take MATH 4200 in their first year. MATH 4200 may be counted as part of the doctoral degree program.

### Graduation Requirements

1) At the end of the first year in the doctoral program each student must take a comprehensive qualifying examination. If needed a student may retake this examination. A passing grade on this examination is mandatory for continuance in the doctoral program. 2) After completing this examination a student with the assistance of her/his adviser will be expected to form a doctoral committee. This committee will determine which courses are to be included in the Graduate Level Statistics electives, and will set the conditions of and conduct the preliminary examination. A passing grade on this examination is mandatory for official admittance into the doctoral program. 3) The student must write and successfully defend a dissertation research project. The specific conditions of the dissertation project are to be determined by each student's doctoral committee, but should consist of original research suitable for publication.

## Statistics (STAT)

*A computerized prerequisite check is run prior to the start of the fall and spring semesters. Students who are pre-registered for a 2000-level STAT course but have not satisfied the prerequisites at the time of the check will be automatically dropped from the course.*

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).**

**1101. First-Year Seminar. 3. [(none)♦FYS] 2000. Statistics and the World. 3. [QB♦(none)]** Discusses statistical reasoning and methods as related to today's society. Emphasizes ideas rather than specific techniques. Focuses on real examples of the use (and misuse) of statistics. Includes sampling, experimentation, descriptive statistics, elementary probability and statistical inference. *Prerequisite:* grade of C or better in MATH 1000, 1400, or equivalent.

**2010. Statistical Concepts for Business and Management Science. 4. [QB♦(none)]** Provides majors in various departments of the College of Business with training in basic statistical concepts, emphasizing application to business problems. Credit cannot be earned in more than one of the following courses: STAT 2010, 2050, 2070, 4220 and 5000. *Prerequisite:* grade of C or better in MATH 1400.

**2050. Fundamentals of Statistics. 4. [QB♦Q]** Presents central ideas and fundamental techniques of statistical inference on applications in the biological sciences. Includes probability models and inferences for means, variances and parameters of discrete distribu-

tions. Introduces statistical computer packages in biweekly labs. Credit cannot be earned in more than one of the following courses: STAT 2010, 2050, 2070, 4220 and 5000. *Prerequisite:* grade of C or better in MATH 1000, 1400, or equivalent.

**2070. Introductory Statistics for the Social Sciences. 4. [QB♦Q]** Presents central ideas of descriptive statistics and statistical inference, as applied to questions in social sciences. Includes graphs, averages, sampling, estimation, hypothesis-testing and relationships between variables. Introduces associated computer skills. Credit cannot be earned in more than one of STAT 2010, 2050, 2070, 4220, 5000. *Prerequisite:* grade of C or better in MATH 1000, 1400, or equivalent.

**2110. Statistical Methods for Business and Management Science. 3.** Provides majors in various departments of the College of Business with training in use of statistical analysis techniques as they apply to business problems. Credit cannot be earned in more than one of the following: STAT 2110, 3050 and 5050, 5060, 5070, 5080. *Prerequisite:* STAT 2010.

**3050. Statistical Methods - General. 3.** Provides undergraduate majors in the Colleges of Arts and Sciences, Agriculture and Education with training in statistical methodology for multiple variable situations. Integrates computer analysis packages such as R MINITAB, SAS and SPSSX into statistical topics. Credit cannot be earned in more than one of the following courses: STAT 2110, 3050 and 5050, 5060, 5070, 5080. *Prerequisite:* STAT 2050, 2070 or equivalent.

**4015 [4010, 4410]. Regression Analysis. 3.** Contains standard topics, as well as some newer and more unconventional ones. Oriented towards analysts who use computer packages for problem solutions. Includes balance of application and theory. Dual listed with STAT 5015. *Prerequisite:* STAT 3050 or equivalent.

**4025 [4020, 4310]. Design and Analysis of Experiments I. 3.** Reviews design and analysis of one-factor experiments and introduces multifactor experiments, Latin squares, nested designs and random effects. Includes topics such as polynomial response curves, trend analysis, split plots and incomplete blocks as time permits. Dual listed with STAT 5025. *Prerequisite:* choice of STAT 3050 or equivalent.

**4045 [4040]. Categorical Data Analysis. 3.** Applied methods for analyzing associations when some or all variables are measured in discrete categories, not continuous scales. Topics include the binomial, multinomial, and Poisson probability models, parameter estimation and hypothesis-testing about proportions, measures of association and tests

for contingency tables, logistic regression, and log-linear models. Dual listed with STAT 5045. *Prerequisite:* STAT 2110, 3050, 5050, 5060, 5070 or 5080.

**4070. Causal Models. 3.** Applications of least-squares and iterative maximum-likelihood methods for drawing cause and effect conclusions from nonexperimental data. Topics include regression-based path analysis, reciprocal causation, confirmatory factor analysis, measurement error, and structural equation models with unmeasured (latent) variables. Cross listed with SOC 4070. *Prerequisite:* one of STAT 3050, 4015, 5050, 5060, 5070, 5080 or equivalent (regression methods).

**4115 [4110]. Time Series Analysis and Forecasting. 3.** An applied introduction to time series and forecasting. Brief coverage of time series regression, decomposition methods, and smoothing will lead into a more detailed coverage of Box-Jenkins (ARIMA) modeling. Computer analyses using MINITAB and SAS will be an important part of the course. Cross listed with ECON 4115; dual listed with STAT 5115. *Prerequisites:* STAT 3050 or equivalent; STAT 4015/5015 recommended.

**4155 [4150]. Fundamentals of Sampling. 3.** Develops methodology of simple random sampling, stratified sampling, and multistage sampling. Provides applications related to physical, social, and biological sciences. Discusses single and two-variable estimation techniques. Presents estimation based on subsamples from subpopulations. Dual listed with STAT 5155. *Prerequisite:* choice of STAT 2010, 2050, 2070 or equivalent.

**4220 [4020]. Basic Engineering Statistics. 3.** Introduces probability models, properties of distributions, statistical inference and development of statistical models for physical and engineering sciences. Credit cannot be earned in more than one of the following courses: STAT 2010, 2050, 2070, 4220 and 5000. *Prerequisite:* MATH 2205, 2355 or equivalent.

**4255 [4250]. Mathematical Theory of Probability. 3.** Calculus-based. Introduces mathematical properties of random variables. Includes discrete and continuous probability distributions, independence and conditional probability, mathematical expectation, multivariate distributions and properties of normal probability law. Dual listed with STAT 5255; cross listed with MATH 4255. *Prerequisite:* grade of C or better in MATH 2210. (Offered fall semester)

**4265 [4260, 4010]. Introduction to the Theory of Statistics. 3.** Presents derivations of theoretical and sampling distributions. Introduces theory of estimation and hypothesis

testing. Dual listed with STAT 5265; cross listed with MATH 4265. *Prerequisite:* STAT/MATH 4255.

**4300. Applied Multivariate Analysis. 3.** The application of multivariate statistical methods in behavioral science research. Topics include: multivariate regression, canonical correlation, discriminate analysis, factor analysis and multidimensional scaling. A wide range of computer assistance is incorporated. Dual listed with STAT 5300. *Prerequisite:* STAT 3050 or equivalent.

**4350. Survey Construction and Analysis. 3.** Examines the issues surrounding the construction (item wording, test theory, and numerical scales), assessment (sampling and psychometrics), and analysis (item analysis, qualitative data analysis, and factor analysis) of survey instruments. Roughly a third of the course is devoted to each of these areas. Dual listed with STAT 5350. *Prerequisite:* STAT 3050.

**4360. Spatial Statistics. 3.** Emphasis is on a generalized linear model approach to the modeling of continuous data, placing model building and the various kriging methods into a single conceptual framework. Dual listed with STAT 5360. *Prerequisite:* STAT 4015.

**4370. Survival Analysis. 3.** Introduction to the modeling of time to event data as it arises in epidemiological and medical research. Topics include parametric and non-parametric estimation for censored data without covariates, and for data with covariates, the proportional hazards regression model, additive hazards regression model and parametric regression models. Dual listed with STAT 5370. *Prerequisites:* STAT 4015 and 4025.

**4460. Statistical Software [5480]. 1.** An introduction to the various statistical software programs currently in use at the University of Wyoming. Topics will include the structure of each language, I/O, programming the basic statistical applications, and a comparison of the other languages. *Prerequisite:* 9 hours in statistics beyond introductory.

**4870. Senior Thesis. 3.** Encompasses senior thesis research project under faculty member guidance and supervision. Faculty sponsorship must be obtained prior to registration. *Prerequisites:* 18 hours in statistics and senior standing.

**4880 [4790]. Problems in Statistics. 1-4 (Max. 9).** Encourages individual initiative on part of students who work on extending their knowledge through library research. *Prerequisites:* senior standing, 8 hours in statistics and consent of instructor.

**5000. Statistical Analysis for Research Workers. 3.** Covers basic concepts of data collection and statistical inference. The material applies to experimental work when

one or two samples have been drawn and one variable has been measured, rather than sophisticated mathematical development, a conceptual statistical approach is utilized in presenting material. Credit cannot be earned in more than one of the following courses: STAT 2010, 2050, 2070, 4220 and 5000. *Prerequisite:* graduate standing.

**5015. Regression Analysis. 3.** Contains standard topics, as well as some newer and more unconventional ones. Oriented towards analysts who use computer packages for problem solutions. Includes balance of application and theory. Dual listed with STAT 4015. *Prerequisite:* STAT 3050 or equivalent.

**5025. Design and Analysis of Experiments I. 3.** Reviews design and analysis of one-factor experiments and introduces multifactor experiments, Latin squares, nested designs, and random effects. Includes topics such as polynomial response curves, trend analysis, split plots and incomplete blocks as time permits. Dual listed with STAT 4025. *Prerequisite:* STAT 3050 or equivalent.

**5045. Categorical Data Analysis. 3.** Applied methods for analyzing associations when some or all variables are measured in discrete categories, not continuous scales. Topics include the binomial, multinomial, and Poisson probability models, parameter estimation and hypothesis-testing about proportions, measures of association and tests for contingency tables, logistic regression, and log-linear models. Dual listed with STAT 4045. *Prerequisite:* two courses in statistics.

**5050. Statistical Methods for the Biological Science. 3.** General statistical analyses and their application to the biological and behavioral sciences. Analysis of variance, regression and correlation methods are studied from a data analytic perspective, emphasizing the conceptual understanding of where and when these techniques should be used and the interpretation of their results. Available computer programs will be utilized. Credit cannot be earned in more than one of the following courses: STAT 3050, 5050, 5060, 5070. Cross listed with ZOO 5050. *Prerequisite:* one course in statistics (all introductory courses except 2000).

**5055. Statistical Methods for the Biological Sciences II. 3.** The statistical toolkit (regression and ANOVA-driven) of methods applicable to the biological and behavioral sciences will be extended to include multiple logistic regression, power and sample size considerations, and computer-intensive methods such as bootstrapping and randomization tests,

which will considerably expand the repertoire of methods that a person could use. *Prerequisite:* STAT 5050 or equivalent.

**5060. Statistical Methods In Psychology. 3.** General statistical analyses and their application to psychology. Analysis of variance, regression and correlation methods are studied from a data analytic perspective, emphasizing the conceptual understanding of where and when these techniques should be used and the interpretation of their results. Available computer programs will be utilized. Credit cannot be earned in more than one of the following courses: STAT 2110, 3050, 5050, 5060, 5070, 5080. Cross listed with PSYC 5060. *Prerequisite:* one course in statistics (all introductory courses except 2000).

**5070. Statistical Methods for the Social Sciences. 3.** General statistical analyses and their application to the social sciences. Analysis of variance, regression and correlation methods are studied from a data analytic perspective, emphasizing the conceptual understanding of where and when these techniques should be used and the interpretation of their results. Available computer programs will be utilized. Credit cannot be earned in more than one of the following courses: STAT 2110, 3050, 5050, 5060, 5070. Cross listed with SOC 5070. *Prerequisite:* one course in statistics (all introductory courses except STAT 2000).

**5080. Statistical Methods for the Agricultural and Natural Resource Sciences. 3.** Brief review of statistical principles. Use of SAS programming. Numerous analysis of variance techniques along with commonly-used experimental designs. Multiple mean comparison, linear contrasts, power of F test, simple linear regression, polynomial regression, analysis of covariance, and some categorical data techniques for students in the agriculture and natural resources sciences. Credit cannot be earned in more than one of the following courses: STAT 2110, 3050, 5050, 5060, 5070, 5080. Cross listed with ENTO 5080. *Prerequisite:* STAT 2050 or equivalent.

**5115. Time Series Analysis and Forecasting. 3.** An applied introduction to time series and forecasting. Brief coverage of time series regression, decomposition methods, and smoothing will lead into a more detailed coverage of Box-Jenkins (ARIMA) modeling. Computer analysis using MINITAB and SAS will be an important part of the course. Dual listed with STAT 4115; cross listed with ECON 5115. *Prerequisites:* STAT 3050 or equivalent; STAT 4015/5015 recommended.

**5155. Fundamentals of Sampling. 3.** Develops methodology of simple random sampling, stratified sampling, and multistage samples.

Provides applications related to physical, social, and biological sciences. Discusses single and two-variable estimation techniques. Presents estimation based on subsamples from subpopulations. Dual listed with STAT 4155. *Prerequisite:* STAT 2070 or equivalent.

**5185. Analysis of Data. 3.** Focuses on data collection, analysis, interpretation, and communication, using contexts relevant to everyday situations. Topics chosen integrate well with the concerns of middle-level teachers and connect with such curriculum areas as health, science, and social studies. This course is not a research methods course. Cross listed with NASC 5180. *Prerequisites:* graduate standing in either degree or non-degree seeking status, and acceptance into the Middle-level mathematics program.

**5210. Statistical Methods I. 3.** Introduction and Overview of Statistical Methods aimed at preparing students for Regression, Design, Linear Models and generalized linear models courses at the graduate level. Students also get an introduction to programming in R/S-Plus and SAS. *Prerequisite:* concurrent registration in STAT 5510, will form the basis of the 1st semester in the grad school.

**5220. Statistical Methods II. 3.** Introduction and Overview of Statistical Methods aimed at preparing students for advanced topics courses in Statistics. Also included is an introduction to programming in SAS and R/Splus. *Prerequisites:* STAT 5210 and concurrent registration in STAT 5520.

**5230. Statistical Methods III. 4.** Continuation of topics in Statistical Methods from 5220; aimed at preparing students for advanced topics courses in Statistics. *Prerequisites:* STAT 5220 and 5520.

**5255. Mathematical Theory of Probability. 3.** Calculus-based. Introduces mathematical properties of random variables. Includes discrete and continuous probability distributions, independence and conditional probability distributions, independence and conditional probability, mathematical expectation, multivariate distributions and properties of normal probability law. Dual listed with STAT 4255; cross listed with MATH 5255. *Prerequisite:* grade of C or better in MATH 2210 or 2355.

**5265. Introduction to the Theory of Statistics. 3.** Presents derivations of theoretical and sampling distributions. Introduces theory of estimation and hypothesis testing. Dual listed with STAT 4265; cross listed with MATH 5265. *Prerequisites:* STAT 4255/5255.

**5300. Applied Multivariate Analysis. 3.** The application of multivariate statistical methods in behavioral science research. Topics include: multivariate regression, canonical cor-

relation, discriminate analysis, factor analysis and multivariate regression, canonical correlation, discriminate analysis, factor analysis and multidimensional scaling. A wide range of computer assistance is incorporated. Dual listed with STAT 4300. *Prerequisite:* STAT 5050, 5060, 5070, 5080.

**5320. Design and Analysis of Experiments II. 3.** Linear models included analysis of variance, analysis of covariance, and regression within its general framework. This is a basic course in the applications of these models containing the standard topics as well as some newer and more unconventional ones. The course is oriented toward the professional statistician who will be involved in the design and analysis of experiments. Extensive use is made of SAS and BMDP in the course. *Prerequisite:* STAT 4025 or 5225.

**5350. Survey Construction and Analysis. 3.** Examines the issues surrounding the construction (item wording, test theory, and numerical scales), assessment (sampling and psychometrics), and analysis (item analysis, qualitative data analysis, and factor analysis) of survey instruments. Roughly a third of the course is devoted to each of these areas. Dual listed with STAT 4350. *Prerequisite:* STAT 3050.

**5360. Spatial Statistics. 3.** Emphasis is on a generalized linear model approach to the modeling of continuous data, placing model building and the various kriging methods into a single conceptual framework. Dual listed with STAT 4360. *Prerequisite:* STAT 4015.

**5370. Survival Analysis. 3.** Introduction to the modeling of time to event data as it arises in epidemiological and medical research. Topics include parametric and non-parametric estimation for censored data without covariates, and for data with covariates, the proportional hazards regression model, additive hazards regression model and parametric regression models. Dual listed with STAT 4370. *Prerequisites:* STAT 4015, 4025 and 4265.

**5380. Bayesian Data Analysis. 3.** Bayesian statistical methods for analyzing various kinds of data. Topics include basic Bayesian ideas and model formulation (priors, posteriors, likelihoods), single- and multiple-parameter models, hierarchical models, generalized linear models, multivariate models, survival models and an introduction to computation methods. *Prerequisites:* at least 2 semesters of calculus and one semester of statistics at or beyond the 4000 level.

**5420. Linear Models. 3.** An introduction to the theory of basic statistical linear models. Topics include: special matrix theory for statistics, multivariate normal distributions, distributions of quadratic forms, as well as

estimation and hypothesis testing in the full rank and less than full rank models. *Prerequisite:* STAT 4015, 4025, 4265 and MATH 2250.

**5430. Geostatistical Sampling and Ore Reserves Estimation. 3.** Designed to provide general geostatistical analyses and their applications for spatial random variables and functions. Topics covered include variogram, cross validation, kriging, cokriging, sampling strategies, and both non-conditional and conditional simulations. Several geostatistics packages will be used to analyze real field data and students are encouraged to use their own data for practicing geostatistical applications. Examples are taken from geohydrology, soil science, crop science, mining, and various environmental studies. Cross listed with SOIL/GEOL 5430. *Prerequisite:* STAT 4015.

**5450. Biological Sampling and Estimation of Animal Abundance. 3.** A quantitative treatment of techniques useful in the biological sampling and estimation of animal abundance. Included are mark release methods, catch-effort methods, change in ratio methods, mortality and survival estimation, transect and quadrat sampling. *Prerequisite:* ZOO 4400.

**5470. Data Analysis. 3.** This course is designed to develop the skill of analyzing data sets using methods of classic statistical analysis, such as analysis of variance, regression, discrete models, descriptive analysis, non-parametrics, and multivariate methods. The focus will be on understanding the various models and methods, computer assisted data analysis, and communication of results (oral and written). *Prerequisite:* 12 graduate level hours in statistics (excluding STAT 5000).

**5490. Statistical Consulting. 1.** An introduction to the art and practice of statistical consulting. Topics include active listening, ascertaining client knowledge level and ability, determining appropriate methods of analysis given limitations, and organizing and managing a consulting session. *Prerequisite:* graduate standing in statistics, 15 hours in statistics.

**5510. Distribution Theory. 4.** Topics covered include probability theory, conditional probability, random variables, special distribution functions, functions of random variables, expectation, random samples, and limiting distributions. *Prerequisite:* MATH 2210, 3000 or MATH/STAT 4265.

**5520. Inference I. 4.** Topics covered include Properties of a random sample, Sufficiency principle, Likelihood principle, point estimation (mle, mom, Bayes estimators, etc. and methods for evaluating estimators), some interval estimation. *Prerequisite:* STAT 5510.

**5530. Inference II. 3.** Topics covered include methods used in Bayesian, Likelihood, Frequentist inference; some methods for robust inference and some large sample theory as needed. *Prerequisite:* STAT 5520.

**5540. Large Sample Theory. 3.** Treats various limiting techniques which can be used to predict the behavior of statistics computed from large data sets. The characteristic function is used in deriving the law of large numbers and various forms of the central limit theorem, including the multivariate normal case. The central and noncentral chi-square distributions are derived as the probability law for certain statistics in the limit. Other topics discussed include modes of probabilistic convergence, speed of convergence, and large sample approximation procedures. *Prerequisite:* STAT 5510.

**5615. Time Series Analysis II. 3.** A treatment of theory and application of ARIMA modeling of times series. Frequency domain analysis is also introduced. Additional topics will be selected from intervention analysis, transfer function (ARMAX) models, outlier analysis, vector ARIMA models, ARCH, GARCH, and state-space models, according to the interests and abilities of the class. *Prerequisites:* STAT 4015/5015, 4115 and 4265/5265.

**5620. Theory of Linear Models. 3.** A theoretical approach to estimation and testing in the general linear model. Topics include: special linear algebra results for statistics, parameterizations, estimability, least squares, best linear unbiased estimation, and testing linear hypotheses. *Prerequisite:* STAT 5630, 5520, MATH 4500.

**5630. Multivariate Analysis. 3.** The subject matter includes derivation of multi-variate normal distributions, the Wishart, and related sampling distributions, multivariate estimation, confidence regions, and hypothesis testing are covered including topics as Hotelling's T squared, profile analysis, discriminate analysis, factor analysis, and cluster analysis. *Prerequisite:* STAT 4265, MATH 2250.

**5640. Generalized Linear Models (GLIM). 3.** This class of models based on exponential family distributions provides a unifying framework for linear normal models, models for categorical data and for survival analysis. Modeling and inference relies on familiarity with exponential family distributions, maximum likelihood inference and likelihood ratio tests. *Prerequisite:* STAT 5520 and STAT 5420.

**5650. Theory of Sampling. 3.** Consists of the theory of simple random sampling, stratified sampling, multistage sampling, and regression

and ratio estimation. Recent developments in sampling are presented. *Prerequisite:* STAT 4265, STAT 4155/5155.

**5660. Computationally Intensive Methods in Statistics. 3.** Advanced statistical inference often relies on methods which are computationally intensive. The basic methods include Newton-Raphson; the EM algorithm; bootstrap and other resampling procedures; kernel density estimators; Laplace's method, importance sampling and MCMC, and saddlepoint and Edgeworth approximations. *Prerequisite:* STAT 5520.

**5670. Mixed Models. 3.** An advanced treatment of models with fixed and random effects. Topics include: model definitions, least-squares, analysis of variance techniques, likelihood procedures, and computational applications. *Prerequisite:* STAT 5620.

**5680. Advanced Bayesian Statistics. 3.** Philosophical principles underlying Bayesian and non-Bayesian statistics. Decision theoretic foundations of Bayesian statistics including loss functions, minimaxity, and admissibility. Construction of conjugate prior distributions and non-informative prior distributions. Bayesian point estimation, hypothesis tests and credible sets. Computational tools for Bayesian problems including Markov chain Monte Carlo (McMC) and other methods for approximating posterior distributions with some emphasis on implementation via a programming language or statistical computing software. As time and interest permit: the normal linear model, non-normal models, hierarchical models, Bayesian model averaging, other topics. *Prerequisites:* STAT 5380; 5420 and 5520.

**5810. Seminar. 1-2 (Max. 4).** Research results are presented by statistics majors. (Faculty also present papers). *Prerequisite:* graduate status in statistics.

**5820. Teaching of Statistics. 1 - 2. (Max 2).** The following topics are presented and discussed: traditional and innovative teaching methods, assessment methods, the purpose of lectures and laboratories, in-class activities, projects, mathematics versus statistics, computer assistance, math anxiety, and group and one-on-one interaction guidelines. *Prerequisite:* consent of instructor.

**5880. Advanced Problems. 1-8 (Max. 8).** Intended to develop the graduate student's ability to expand his theoretical knowledge by using library materials and working under close supervision of a faculty member who is an expert in the area of study. *Prerequisite:* 12 hours in statistics and consent of instructor.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Graduate level course designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

**5990. Internship. 1-12 (Max 24).** *Prerequisite:* graduate standing.

## Theatre and Dance

205 Buchanan Center for the

Performing Arts, 766-2198

FAX: (307) 766-2197

Web site: [uwyo.edu/thd/](http://uwyo.edu/thd/)

Department Head: Leigh Selting

### Professors:

**WILLIAM MISSOURI DOWNS**, B.S. Northern Michigan University 1977; M.F.A. University of Illinois 1980; M.F.A. University of California-Los Angeles 1988; Professor of Theatre and Dance 2004, 1994.

**LEE HODGSON**, B.A. University of Wyoming 1977; M.A. 1980; M.F.A. California Institute of the Arts 1983; Professor of Theatre and Dance 2000, 1987.

**MARSHA F. KNIGHT**, B.F.A. University of Utah 1979; M.F.A. 1983; Professor of Theatre and Dance 1998, 1984.

**LEIGH SELTING**, B.A. University of Nebraska at Kearney 1983; M.F.A. University of Idaho 1985; Professor of Theatre and Dance 1999, 1989.

**LOU ANNE WRIGHT**, B.A. California State University-Northridge 1990; M.F.A. National Theatre Conservatory 1993; Professor of Theatre and Dance 2007, 1994.

**Associate Professors:**

**CECILIA ARAGÓN**, B.S. McMurry University 1991; M.A. University of New Mexico 1996; Ph.D. Arizona State University 2003; Associate Professor of Theatre and Dance 2011, 2005.

**JENNIFER DECKERT**, B.F.A. University of Utah 2003; M.F.A. 2005; Associate Professor of Theatre and Dance 2013, 2007.

**CASEY KEARNS**, B.A. Chadron State College; M.F.A. University of Kansas; Associate Professor of Theatre and Dance 2011, 2005.

**MARGARET WILSON**, B.A. University of Wyoming 1981; M.S. 1987; Ph.D. Texas Woman's University 2007; Associate Professor of Theatre and Dance 2008, 2005.

**Assistant Professors:**

**SHARON HUIZINGA**, B.A. University of Wyoming 1998; M.F.A. University of British Columbia 2012; Assistant Professor of Theatre and Dance 2013.

**KEVIN INOUE**, B.A. Earlham College 1998; M.F.A. Virginia Commonwealth University 2012; Assistant Professor of Theatre and Dance 2014.

**Adjunct Professor:**

Neil F. Humphrey

**Degrees Offered**

The Department of Theatre and Dance offers curricula leading to the B.A. degree and the Bachelor of Fine Arts and courses which fulfill a part of University Studies and various colleges' requirements, including the College of Arts and Sciences.

**Curricula**

Students may not take a course for S/U credit to satisfy course requirements in the major. This does not apply to courses offered for S/U only. Requirements for students majoring in the areas of the department are indicated below.

**Theatre**

The study of theatre provides students with a broad understanding of the art of theatre appropriate to theatre's position as a fine art in a liberal arts college. The study of theatre is considered to provide a basis for more specialized theatre study in a graduate or professional school. The liberal arts education in theatre together with extensive experience in the production program also provides the

foundation for a professional career in theatre, motion pictures, or television drama for those individuals with special desires and abilities. Secondary teaching certification in theatre can be obtained through this program of study.

**Dance**

The dance concentration within the Department of Theatre and Dance is designed to provide students with a broad foundation in the humanities and specific emphasis in performance and production aspects of dance. Students pursuing this course of study will have opportunities to attain technical competency in ballet and/or modern dance, to perform in yearly dance productions, to obtain practical experience in the fundamentals of teaching dance and to gain experience in technical theatre as an aid to dance production. The program seeks to provide a comprehensive view of dance as an artistically expressive medium, as well as a creative and recreational tool to human expression.

Students completing this program will qualify for more advanced private instruction as well as advanced academic instruction.

All dance students are matriculated into the BA degree. Students wishing to apply for the BFA in Dance Performance or BFA in Dance Science do so the second semester of their freshman year.

**Programs**

**B.A. with Theatre Concentration**

***These are the required courses for a B.A. with Theatre Concentration:***

*Certain substitutions may have to be made and all scheduling of classes should be discussed with an adviser.*

THEA	1040	.....	0.5
THEA	1100	.....	3
THEA	1200	.....	3
THEA	2010	.....	3
THEA	2020	.....	3
THEA	2040	.....	0.5
THEA	2220	.....	3
THEA	2800	.....	3
THEA	3730	.....	3
THEA	3740	.....	3
THEA	3810	.....	3
THEA	3820	.....	3
THEA	4820	.....	3
THEA	4930	.....	3
THEA	4940	.....	3

Theatre majors are limited to no more than 50 credits in the major field of which a minimum of 15 must be at the 4000-level.

**B.A. with Dance Concentration**

***These are the required courses for a B.A. with Dance Concentration:***

*Certain substitutions may have to be made and all scheduling of classes should be discussed with an adviser.*

THEA	1021	.....	1
THEA	1040	.....	0.5
THEA	1200	.....	3
THEA	1405	.....	1
THEA	1420	.....	1
THEA	1440	.....	1
THEA	1450	.....	1
THEA	2040	.....	0.5
THEA	2050	.....	1
THEA	2200	.....	3
THEA	2480	.....	1
THEA	3021	.....	1
THEA	3100	.....	3
THEA	3410	.....	1
THEA	3420	.....	1
THEA	3430	.....	1
THEA	3440	.....	1
THEA	3480	.....	1
THEA	4010	.....	4
THEA	4030	.....	4
<i>Plus 8 credits in any combination of 4010 and 4030</i>			
THEA	4200	.....	3
THEA	4250	.....	2
THEA	4260	.....	2
THEA	4880	.....	1
BIOL	1010	.....	4
HLED	1221	.....	2
ZOO	2040	.....	4

**Bachelor of Fine Arts**

This degree program in theatre and dance permits 60-70 credits in the major field. It is designed primarily for students who seek additional professional training in theatre and dance or who wish to enter M.F.A. graduate programs.

Students seeking the professional degree will be expected to meet degree requirements as specified by the College of Arts and Sciences. Students may substitute advanced theatre and dance courses for university electives.

For other requirements consult with the Department of Theatre and Dance.



**Bachelor of Fine Arts****Theatre/English Concentration**

This degree program permits a total of 60-70 credits in the major. It is designed primarily for those desiring to pursue professional education courses and certification to programs.

**These are the required courses for a B.F.A. with Theatre/English Concentration:**

*Certain substitutions may have to be made and all scheduling of classes should be discussed with an adviser.*

THEA	1040	0.5
THEA	1100	3
THEA	1200	3
THEA	2010	3
THEA	2020	3
THEA	2040	0.5
THEA	2220	3
THEA	2800	3
THEA	3730	3
THEA	3740	3
THEA	3810	3
THEA	3820	3
THEA	4820	3
THEA	4830	3
THEA	4930	3
THEA	4940	3
ENGL	2000	6
ENGL	4000	9
ENGL	4110 or 4120	3

**Bachelor of Fine Arts****Acting Concentration****(Preprofessional)**

This degree program permits a total of 60-70 credits in the major. It is designed primarily for those desiring to pursue additional pre-professional training in theatre and dance or for those preparing to enter M.F.A. graduate programs.

**These are the required courses for a B.F.A. with Acting Concentration:**

*Certain substitutions may have to be made and all scheduling of classes should be discussed with an adviser.*

THEA	1040	0.5
THEA	1100	3
THEA	1200	3
THEA	1700	2
THEA	2010	3
THEA	2020	3
THEA	2040	0.5
THEA	2160	2
THEA	2170	3
THEA	2220	3
THEA	3720	2
THEA	3730	3

THEA	3740	3
THEA	3750	3
THEA	3790	3
THEA	3950	3
THEA	4710	3
THEA	4720	3
THEA	4730	2
THEA	4820	3
THEA	4930	3
THEA	4940	3
<i>and three hours from the following:</i>		
THEA	1410	1
THEA	1430	1
THEA	1450	1
THEA	1480	1

**Bachelor of Fine Arts****Dance Performance Concentration****(Preprofessional)**

This program permits a total of 71-74 credits in the major. It is designed primarily for students in dance who wish to pursue additional preprofessional training in theatre and dance or for those preparing to enter M.F.A. graduate programs.

The BFA in Dance Performance is a professionally oriented degree for students interested in a career of performing or choreographing. In addition to specific course work, BFA students complete a senior project which provides summation and synthesis to their training. Admission to the BFA is by application only. Students will be required to submit an application no sooner than spring of their freshman year and interview during the end of the spring semester. All students admitted to the BFA program are considered on provisional status in their first year in the program, and are evaluated on a yearly basis on maintaining a 3.0 GPA in dance required courses, demonstrating appropriate progress in artistic and technical growth and active participation in the Department of Theatre and Dance productions and research. Students wishing to apply for the BFA in Dance Performance do so the second semester of their freshman year.

**These are the required courses for a B.F.A. with Dance Performance Concentration:**

*Certain substitutions may have to be made and all scheduling of classes should be discussed with an adviser.*

THEA	1021	1
THEA	1040	0.5
THEA	1100	3
THEA	1200	3
THEA	1405	1
THEA	1420	1

THEA	1440	1
THEA	1450	1
THEA	2040	0.5
THEA	2050	1
THEA	2160 or	2
THEA	2800 or	3
THEA	3820	1
THEA	2200	3
THEA	2450	1
THEA	2480	1
THEA	3021	1
THEA	3100	3
THEA	3410	1
THEA	3420	1
THEA	3430	1
THEA	3440	1
THEA	3480	1
THEA	3490	1
THEA	4001	2
THEA	4010	4
THEA	4030	4
<i>(Additional 8 credits in any combination of 4010 and 4030)</i>		
THEA	4200	3
THEA	4250	2
THEA	4260	2
THEA	4700	1
THEA	4880	1
THEA	4880	1
THEA	4950	3
or		
THEA	4990	2
THEA	4990	1-3
or		
AS	4990	1-3
<i>The following courses outside the department are also required:</i>		
BIOL	1010	4
HLED	1221	2
ZOO	2040	4

**Bachelor of Fine Arts****Dance Science Concentration****(Preprofessional)**

This program permits a total of 78 credits in the major. It is designed primarily for students in dance who wish to pursue additional preprofessional training in theatre and dance or for those preparing to enter M.F.A. graduate programs.

The BFA in Dance Science is a professionally oriented degree for students interested in a career of dance research and wish to pursue some aspect of the science field in relation to dance. In addition to specific course work, BFA students complete a senior project which provides summation and synthesis to their training. Admission to the BFA is by application only. Students will be required to submit

an application no sooner than spring of their freshman year and interview during the end of the spring semester. All students admitted to the BFA program are considered on provisional status in their first year in the program, and are evaluated on a yearly basis on maintaining a 3.0 GPA in dance required courses, demonstrating appropriate progress in artistic and technical growth and active participation in the Department of Theatre and Dance productions and research. Students wishing to apply for the BFA in Dance Science do so the second semester of their freshman year.

**These are the required courses for a B.F.A. with Dance Science Concentration:**

*Certain substitutions may have to be made and all scheduling of classes should be discussed with an adviser.*

THEA 1021	.....1
THEA 1040	..... 0.5
THEA 1100	.....3
THEA 1200	.....3
THEA 1405	.....1
THEA 1420	.....1
THEA 1440	.....1
THEA 1450	.....1
THEA 2040	..... 0.5
THEA 2050	.....1
THEA 2200	.....3
THEA 2480	.....1
THEA 3021	.....1
THEA 3100	.....3
THEA 3410	.....1
THEA 3420	.....1
THEA 3430	.....1
THEA 3440	.....1
THEA 3480	.....1
THEA 4010	.....4
THEA 4030	.....4
<i>(Additional 8 credits in any combination of 4010 and 4030)</i>	
THEA 4200	.....3
THEA 4250	.....2
THEA 4260	.....2
THEA 4700	.....1
THEA 4880	.....1
THEA 4990	.....*3

\*This includes 1 credit of Independent Study Research Methods and 2 credits in Senior Research Project

*The following courses outside the department are also required:*

BIOL 1010	.....4
KIN 3050	.....2
ZOO 2040	.....4
PSYC 1000	.....4
FCSC 1140 or	.....2
FCSC 1141	.....3

KIN 2030 or	.....3
KIN 3034	.....3
KIN 3037 or	.....3
KIN 3038	.....3
Additional upper-division required course work (minimum 6 hours from the following courses):	
KIN 3021	.....4
KIN 3040	.....3
KIN 3042	.....3
FCSC 3145	.....3
FCSC 4147	.....3
PSYC 3120	.....3
PSYC 3250	.....3
PSYC 4070	.....3

**Bachelor of Fine Arts Design/Technical Concentration (Preprofessional)**

Students in the B.F.A. degree program who are completing the Design/Technical concentration will have the option of petitioning for permission to serve on the production staff of a departmental production as a designer or technician. Ordinarily, the petition would be submitted to the departmental faculty during the student's junior year and the project would be completed during the student's senior year. This project would be done under THEA 4880 or 4990 for 1 to 3 hours of credit.

**These are the required courses for a B.F.A. with Design/Technical Concentration:**

*Certain substitutions may have to be made and all scheduling of classes should be discussed with an adviser.*

THEA 1040	..... 0.5
THEA 1100	.....3
THEA 2010	.....3
THEA 2020	.....3
THEA 2040	..... 0.5
THEA 2145	.....3
THEA 2150	.....3
THEA 2220	.....3
THEA 2250	.....3
THEA 2800	.....3
THEA 2810	.....3
THEA 2990	.....3
THEA 3790	.....3
THEA 3810	.....3
THEA 3820	.....3
THEA 3850	.....2
THEA 4930	.....3
THEA 4940	.....3
THEA 4990	.....3
ART 1005	.....3
<i>Plus 2 of the following 3 courses:</i>	
THEA 3805	.....3
THEA 4810	.....3
THEA 4850	.....3

**Recommended Electives:**

THEA 2160	.....2
THEA 4820	.....3
ART 2010	.....3
ART 2020	.....3

**Bachelor of Fine Arts**

**Theatre and Dance (Musical Theatre Performance Concentration)**

*The following are the required courses for a Bachelor of Fine Arts in Performance (Musical Theatre):*

THEA 1040	..... 0.5
THEA 1100	.....3
THEA 1200	.....3
THEA 1300	.....4
THEA 1360	.....3
THEA 1700	.....2
THEA 2010	.....3
THEA 2020	.....3
THEA 2040	..... 0.5
THEA 2160	.....2
THEA 2170	.....3
THEA 2220	.....3
THEA 2340	.....6
THEA 3720	.....2
THEA 3730	.....3
THEA 3740	.....3
THEA 3790	.....3
THEA 3950	.....3
THEA 4330	.....3
THEA 4710	.....3
THEA 4720	.....3
THEA 4820	.....3
THEA 4940	.....3

*Plus 3 hours from the following:*

THEA 1410	.....1
THEA 1430	.....1
THEA 1450	.....1
THEA 1480	.....1

Plus two additional dance courses in an area of choice.

**Minor Programs**

**The following courses are required for a minor in Theatre:**

THEA 1040	..... 0.5
THEA 1100	.....3
THEA 1200	.....3
THEA 2010	.....3
THEA 2020	.....3
THEA 2040	..... 0.5
THEA 2220	.....3
THEA 2800 or	.....3
THEA 3810 or	.....3
THEA 3820	.....3

Plus 3 hours of electives in Theatre and Dance (must be 4000 level or above)

The following courses are required for a minor in Dance:

THEA 1040.....	0.5
THEA 1410.....	1
THEA 1420.....	1
THEA 1430.....	1
THEA 1440.....	1
THEA 1480.....	1
THEA 2040.....	0.5
THEA 2200.....	3
THEA 3410.....	1
THEA 3420.....	1
THEA 3430.....	1
THEA 3440.....	1
THEA 4010.....	2
THEA 4030.....	2
THEA 4250.....	2

Plus 3 hours of electives in Theatre and Dance (must be 4000 level or above)

## Scholarships

A number of scholarships are available to interested majors in theatre or within the dance option. The University Theatre also maintains a summer company. Applications should be sent to the Department of Theatre and Dance, Dept. 3951, 1000 E. University Ave., Laramie, WY 82071.

## Departmental Activities/Organizations

The department sponsors one of the largest all-student activities on campus. Nearly 250 students take part in its productions each season. All students are eligible to participate in its productions through auditions.

Productions are mounted in the Center for the Fine Arts which includes a flexible proscenium theatre and an experimental-studio theatre complete with scene and costume support facilities.

Auditions, open to all university students, are publicly announced for each production. Qualified students may receive credit in performance and production areas (THEA 2050).

The Wyoming Summer Theatre presents a season of plays of varying types during the summer session. Theatre majors and minors are urged to spend at least one summer working with this group.

## Graduate Study

At present, no program for graduate degrees in theatre and dance is offered; however, courses may be counted at the graduate level.

## Theatre and Dance (THEA)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

**1000. Introduction to the Theatre. 3. [CA◀▶H]** A broad examination of theatre through the ages. Designed for students with little or no knowledge of theatre history, production, dramatic literature, creativity art, entertainment and censorship from the dawn of history to the 21st century. (Offered both semesters)

**1020. Freshman Seminar: Academic and Professional Issues in Theatre. 3. [I,L◀▶(none)]** Introduces first year theatre and dance students to the basic skills necessary to engage in intellectual discourse in their fields. It aims to advance students' analytical, research, and writing skills by studying the meaning and aesthetics of the performing arts through special topics and Aristotle's poetics.

**1021. Freshman Seminar: Academic and Professional Issues in Dance. 1. [I,L◀▶(none)]** Introduces freshman to the discipline of dance and academic study at the University of Wyoming. Key intellectual and literacy concepts will be introduced, including, but not limited to: critical thinking and analysis, knowledge of the discipline, career options, diversity of the discipline, university and region.

**1040. Production Crew I. 0.5.** Participation in one Departmental production during semester enrolled. Contribute to the preparation and/or actual production of one stage play in the area(s) of lighting, costume construction, set construction, scenic painting, stage properties, or arts management. Required for all Theatre & Dance freshmen. *Prerequisite:* consent of instructor. (Offered both semesters)

**1100. Beginning Acting. 3. [CA◀▶H]** Explores inner resources of beginning actor and brings these resources to bear upon the art of creating a believable stage image. (Offered both semesters)

**1101. First-Year Seminar. 3. [(none)◀▶FYS]**

**1200. Introduction to Stage Design. 3.** Introduces and explores visual aesthetic principles as they relate to various aspects of stage design. Studio projects in scene, lighting, and costume design supplement lectures. *Prerequisite:* for other design courses. (Normally offered fall semester)

**1300. Musical Theatre Workshop. 1 (Max. 16).** Workshop production of a Musical or Musical Theatre scenes. (Offered both semesters)

**1340. Musical Theatre Class Voice. 3.** Group instruction in singing techniques and performance styles associated with Musi-

cal Theatre. Includes demonstration, brief lectures, discussion, and active participation through singing, analyzing, movement, and scene preparation.

**1360. Fundamentals of Music for Theatre Majors. 3.** Basics of music theory to include music notation, rhythm, pitch, scales, key signatures, triads, and basic ear training and keyboard skills, specific to the needs of Musical Theatre. Assumes little or no music theory background.

**1405. Introduction to Pilates Training. 1 (Max. 2).** An introduction to Pilates based training, including mat work and exercises on the Reformer. *Prerequisite:* consent of instructor.

**1410. Ballet I/I. 1. [CA◀▶H]** Introduces principles and practices of classical ballet technique.

**1420. Ballet I/II. 1. [CA◀▶H]** Continues studies in classical ballet technique. *Prerequisite:* THEA 1410. (Offered spring semester)

**1430. Modern Dance I/I. 1. [CA◀▶H]** Introduces principles and techniques of modern dance.

**1440. Modern Dance I/II. 1. [CA◀▶H]** Continues studies in modern dance technique. *Prerequisite:* THEA 1430. (Offered spring semester)

**1450. Beginning Tap Dance. 1.** Explores basic tap techniques and related principles of tap dance composition. (Offered spring semester)

**1470. Men's Technique. 1 (Max. 2).** Introduces and develops the principles and techniques of movement and dance specific to men.

**1480. Beginning Jazz. 1. [(none)◀▶H]** Introduces jazz dance. (Offered fall semester)

**1700. Voice for the Actor. 2.** Introduction to voice work. Emphasizes breath freedom, flexibility and support for the actor. Methodologies studied include: Fitzmaurice Voicework, Linklater and Lessac systems.

**2005. Creative Drama in the Classroom. 3.** Focuses on K-12 Theatre teaching methods. Students discover teaching methods for integrating improvisation, storytelling, movement/dance, and puppetry into the school curriculum. Students design and implement theatre lessons using these creative drama techniques. To engage real life practice teaching, students are given opportunities to teach creative drama lessons to the class.

**2010. Theatrical Backgrounds Drama I. 3.** First semester of a two-course series. Introduces dramatic literature through the ages.

**2020. Theatrical Backgrounds Drama II. 3.** Second semester of a one-year course. Continues THEA 2010. *Prerequisite:* THEA 2010.

**2030 [3500]. Beginning Playwriting. 3.** Introduces writers to the creative process of playwriting (writing for the stage) or screen-

writing (writing for the movies). Strongly emphasizes character and story development, as well as practical side of the industry. Students write a play or screenplay. *Prerequisites:* WA and THEA 1000, 1100.

**2040. Production Crew II. 0.5.** Continues the “hands-on” production crew experience provided by Production Crew I. Contribute to a Theatre Department production in the area(s) of lighting, costume construction, set construction, scenic painting, stage properties, stage management, or arts management. Required for all Theatre & Dance majors. *Prerequisite:* THEA 1040.

**2050. Theatre Practice. 1-2 (Max. 4).** Encompasses individually supervised practical training in performance and production. Offered for S/U only. *Prerequisite:* consent of instructor.

**2145. Costume Construction. 3.** Teaches the basic skills and terminology that are used in costume construction. Teaches hand and machine sewing focusing on techniques used to stitch historical and modern costumes as well as basic knowledge of fabric.

**2150. Drafting for Design. 3.** Introduces Design and Technical students to the basics of hand drafting and numerous drafting techniques and conventions. After completing this course, students will be well prepared for scenic and lighting design courses. *Prerequisite:* THEA 1200.

**2160. Stage Makeup. 2.** Introduction to theatrical makeup with the stage performer in mind. Focus on principles, materials, and techniques; concentrating on problems of designing and executing specific makeup designs and applications for a wide range of ages, types, and styles. (Offered fall semester)

**2170. Speech for the Actor. 3.** Studies speech techniques, including the International Phonetic Alphabet and Standard American Speech for the Stage. Builds upon the Fitzmaurice-Voicework technique as well as other voice methodologies. *Prerequisites:* THEA 1100 and 1700.

**2180. Costume Crafts. 3.** Focuses on the area of costume crafts which may include but not limited to dyeing, millinery, masks, fabric painting and distressing, working with a variety of materials. *Prerequisite:* THEA 2145. (Offered spring semester every other year)

**2200. Backgrounds of Dance. 3. [CA,G◀H]** Surveys ethnic and theatrical dance forms from primal society to 20th century. Examines the place of the arts as a reflection of the culture. (Offered fall semester)

**2220. Stagecraft. 3.** Introduces students to basic stage production practices and techniques, including safe rigging practices, set

construction, scenic painting, stage properties, and stage lighting. Students are encouraged to participate in “hands-on” demonstrations during classes. (Offered both semesters)

**2240. Stage Production. 3.** Introduces students to basic Stage Production techniques in numerous areas, including but not limited to costume construction, property design and construction, scenic painting, upholstery, and lighting instrument repair and maintenance. *Prerequisite:* THEA 2220.

**2250. Computer Aided Design I. 3.** Introduces students to computer drafting techniques for the Theater using AutoCAD. Students learn the basics of two-dimensional drawing using AutoCAD, and also learn basic drawing standards as they apply to the Theater. *Prerequisites:* THEA 1200, THEA 2150.

**2340. Musical Theatre Voice Lesson. 1 (Max. 4).** Solo instruction in singing techniques and performance styles associated with Musical Theatre. Includes demonstration, brief lecture, discussion, and active participation through singing, analyzing, movement, and performance.

**2400. Vertical Dance I. 1.** An introduction to vertical dance including safety issues, beginning rigging and performance. Satisfactory/Unsatisfactory only. *Prerequisite:* consent of instructors.

**2410. Ballet II/I. 1.** Continues studies in classical ballet. *Prerequisite:* THEA 1420.

**2420. Ballet II/II. 1.** Continues studies in classical ballet. *Prerequisite:* THEA 2410.

**2430. Modern Dance II/I. 1.** Continues studies in modern dance technique. *Prerequisite:* THEA 1440.

**2440. Modern Dance II/II. 1.** Continues studies in modern dance technique. *Prerequisite:* THEA 2430.

**2450. Tap II. 1.** Continues studies in techniques and principles of tap dance. *Prerequisite:* THEA 1450. (Offered spring semester in alternate years)

**2480. Jazz II. 1. [(none)◀H]** Continues studies in techniques and principles of jazz dance. *Prerequisite:* THEA 1480. (Offered spring semester)

**2800 [3800]. Stage Lighting I. 3.** Examines the elemental aspects of stage lighting including equipment, facilities, color, and fundamental electricity. Requires studio work on departmental productions. Intended for majors in the program. *Prerequisite:* THEA 2220. (Normally offered fall semester)

**2810. Scenic Painting for the Theatre. 3.** Introduces the art of scenic painting by the hands-on use and instruction of a variety of scenic paints, application on select construction materials, the use of unique tools and

techniques commonly used to paint scenery for the stage. Safe use and proper handling of such material are addressed. *Prerequisite:* THEA 2220.

**2900. Sound Design for Theatre and Dance. 3.** Examines the basic aspects of sound design for the theatre, dance, entertainment and film worlds. Topics covered include recording, sampling, live mixing, playback, and non-linear editing through several software packages. *Prerequisite:* THEA 2220.

**2990. Period Styles in Design for Theatre. 3.** Developed to provide an overview of social cultural, art, architecture, music, fashion, literature, and period styles and décor from antiquity to the modern age of western civilization applicable to theatrical stage design.

**3021. Foundations of Dance Pedagogy. 1.** Introduces students to basic theories and practices of dance pedagogy. Lecture and discussion will be balanced with peer teaching and coaching, observation of lessons and integration within a dance classroom situation with some teaching responsibilities and development of a portfolio with lessons and resources for teaching. *Prerequisites:* sophomore standing in the department of Theatre and Dance; successful completion of THEA 3420 or THEA 3440.

**3100. Kinesiology for Dance. 3.** Encompasses seminar in current kinesiology research for dancers. Includes practicum based projects, lectures and supplementary materials. *Prerequisite:* ZOO 2040. (Offered every third semester)

**3160. Advanced Stage Makeup. 2.** Extension of Stage Makeup, focusing primarily on the development of a life mask and ultimately prosthetics using a variety of mediums. *Prerequisite:* THEA 2160.

**3180. Drama and Religion. 3.** Drama and religion seek to communicate ideas about the ultimate meaning of human life. Both influence and are influenced by the culture from which they developed. Examines plays that are influenced by the Bible, Greek plays whose concepts have influenced Christianity over the centuries, and modern plays that address religious issues. Cross listed with RELI 3180. *Prerequisite:* junior standing.

**3400. Vertical Dance II. 1 (Max. 2).** A continuing course in vertical dance emphasizing the math and physics of the rigging; safety and design, choreography and research in the field. *Prerequisites:* completion of THEA 2400 and consent of instructors.

**3410. Classical Ballet III/I. 1 (Max. 2).** Continued studies in classical ballet technique. Emphasizes improving technical skills and introducing more advanced steps. Includes

research into one discipline of ballet. *Prerequisite:* successful completion of THEA 1420 or its equivalent and consent of instructor.

**3420. Classical Ballet III/II. 1 (Max. 2).** Continued studies in classical ballet technique. Emphasizes broadening the dancer's movement vocabulary while refining acquired technical skills. Dancers begin work in study of Baroque dance terms. *Prerequisite:* successful completion of THEA 3410 and consent of instructor.

**3430. Modern Dance III/I. 1. (Max. 2).** Continued studies in modern dance technique. Presents rhythmic analysis, introduction to pre-classic dance forms and historical survey of modern dance. *Prerequisite:* successful completion of THEA 1440 or its equivalent as deemed by instructor.

**3440. Modern Dance III/II. 1. (Max. 2).** Continued studies of sequential modern dance technique at intermediate level. Introduces Laban effort/shape theory, compositional forms, improvisation and additional rhythmic analysis. *Prerequisite:* THEA 3430 or its equivalent as deemed by instructor.

**3480. Jazz III/I. 1 (Max. 2).** An intermediate jazz technique class. Students will learn varying styles of jazz dance, ranging from historical to contemporary, and will perform these for evaluation and incorporate them into class compositions. *Prerequisite:* THEA 2480. (Offered fall semester)

**3490. Jazz III/II. 1 (Max. 2).** An advanced class in jazz technique and performance. Students will learn varying styles of jazz dance, ranging from historical to contemporary, and will perform these for evaluation as well as incorporate them into class compositions. *Prerequisite:* THEA 3480. (Offered spring semester)

**3600. Teaching Theatre in Elementary or Secondary School. 3.** Focuses on aspects of age appropriate teaching methods, strategies, and curriculum planning for either elementary or secondary education. Additional emphasis include planning a production season, arts management and budgeting, using national and state content and performance standards, assessing student growth, and developing community advocacy plans. *Prerequisite:* THEA 1100.

**3650. Theatre for Young Audiences: Plays and Production. 3.** Highlights aspects of performance and directing for child audiences. Students will explore the work of outstanding contemporary playwrights who are writing for young audiences, and develop techniques in writing, acting, and directing for and with young people. *Prerequisite:* THEA 1100.

**3720. Intro to Stage Combat. 2.** The basic techniques used in staging both unarmed stage combat and rapier and dagger fight scenes. Students will experience the process of learning, rehearsing, and performing fight scenes. Includes analysis, discussion, training exercises, and choreographed performance. General curriculum follows that set forth by the Society of American Fight Directors. *Prerequisite:* THEA 1100. (Normally offered fall semester)

**3730. Intermediate Acting. 3.** Develops the actor's voice and body for characterization and character interaction through performance of scenes. Study of character and scene analysis. *Prerequisites:* THEA 1100. (Normally offered fall semester)

**3740. Acting Styles. 3.** Focuses on textual analysis of plays from different periods and styles of dramatic literature. Emphasizes vocal and physical interpretation of character as represented in non-realistic styles of drama. *Prerequisites:* THEA 1100 and 3730. (Normally offered alternating spring semesters)

**3750. Acting for the Camera. 3.** Addresses performance skills required in acting for the camera. Covers various techniques, styles, and skills necessary to be successful in the professional world of film and television as an actor. Students perform scenes for 3-camera and single camera set-ups, and become familiar with rudimentary technical skills as crewmembers for shoots. Lecture and test material cover career opportunities, union affiliations, and current trends in the film and television industry. *Prerequisites:* THEA 1100 and 3730.

**3790. Stage Management. 3.** Study of the essential elements of supervising theatrical productions. Stresses the art of organizing auditions, casts, crews, rehearsals, and performances while developing a unique professional relationship with directors, designers and actors. Students will work on a live production. *Prerequisites:* THEA 1100, 1200, 2220.

**3805. Stage Lighting II. 3.** Analyze proposed productions in terms of period, style, theatre limitations and instrumental inventories. Determine appropriate design solutions in written descriptive analyses that result in 2-D drawings of the design. Produce all supporting paperwork including drafting a plan view, section view, instrument schedules, magic sheets and proposed cue lists. *Prerequisites:* THEA 2220, 2800, 2810 and 2900.

**3810. Scene Design. 3.** Applies graphic design to scenic design commencing in drop point perspective, designer's elevations and scenic design rendering. Requires practical work on theatre productions. *Prerequisite:* THEA 2150. (Normally offered spring semester)

**3820 [4840]. Stage Costuming I. 3.** A study of basic drawing and rendering skills, and a selective study of historical silhouettes. Objectives include the ability to trust instinct, application of the basic elements of design, applying historical reference and research to a specific character, developing a concept and finally the application of these principles to a final project. *Prerequisite:* THEA 1100. (Normally offered fall semester)

**3840. Historical Costumes from the Skin Out. 3.** Learning how to replicate period gowns and undergarments prior to the 1920s by draping and flat-patterning techniques. Includes the research and construction of one complete set of period undergarments and gown either as an individual or in a team to be determined by the complexity of the garment and the skill level of the students. *Prerequisite:* FCSC 3174 (4170) or FCSC 3175.

**3850. Design and Technology Seminar. 2.** Introduces designer/technician to process of preparing successful interview material, including a professionally developed portfolio. Exposes designer/technician to business aspects of the theatre world, including resumes, letters of inquiry and application, contracts, unions and professional organizations, internships, apprenticeships, URTAs and professional design/technical training programs. Culminates in junior End-of-the-Year Evaluations. *Prerequisite:* junior standing in the BFA Program with Design/Technical emphasis.

**3890. Lighting CADD. 3.** Designed for the advanced lighting student, provides further exploration of the computer technology that has become so critical for modern lighting design. Introduces students to software programs such as VectorWorks, Lightwright, and Photoshop, as well as networking and advanced programming for modern light boards. *Prerequisites:* THEA 2250 and 2800.

**3910 [591]. 20th Century Theatre Diversity. 3.** Studies plays and production techniques, within the context of historical and sociological events, as developed in the 20th Century that has led to the cultural diversity seen in modern theatre. *Prerequisite:* junior standing. (Normally offered spring semester)

**3950. Dialects for the Actor. 3.** Introduces the actor to five major dialects for the stage. Examines sensibility, vowel and consonant changes, pitch placement and charting. *Prerequisites:* THEA 1100, 1700, and 2170.

**4000. Character Dance. 1.** Principles, style and technique of character dance. *Prerequisite:* THEA 3410.

**4001. Historical Dance. 1-2 (Max. 2).** Historical dance forms in the "Noble Style" dating from the 15th through 18th Centuries. Class

work covers the relationship of musical forms to the specific step vocabulary and dances of each period, deportment, period costume as it relates to movement, social environment, period style with an emphasis on reconstruction of 17th and 18th Century dances from Feuillet notation. *Prerequisite:* THEA 3420.

**4010. Advanced Ballet. 2-3 (Max. 18).** Encompasses progressive technical training and performance style. *Prerequisite:* THEA 3420.

**4030. Advanced Modern Dance. 2-3 (Max. 18).** Encompasses progressive technical training and performance style in modern dance techniques. *Prerequisite:* THEA 3440.

**4060. English/Theatre Studies in \_\_\_\_\_.** 3. Identical to ENGL 4060. (Normally offered spring semester)

**4200. 20th Century Dance. 3. [CA,WC◀COM3]** Intensely studies dance in 20th Century, emphasizing contemporary movement in modern, ballet, jazz and musical theatre dance. Examines social, political and aesthetic trends influencing dance theory and performance. *Prerequisite:* THEA 2200.

**4230. Greek Tragedy. 3.** Reading and discussion of major plays by Aeschylus, Sophocles, and Euripides, together with examination of the performance and social context of Greek drama, its use of traditional myths, and selected issues in contemporary scholarship on the tragedies. Cross listed with CLAS/ENGL 4230. *Prerequisite:* 3 hours of classics courses. (Offered in spring in alternate years)

**4250. Beginning Dance Composition. 2.** Presents and criticizes movement studies based on various approaches to composition. Explores experimentation in choreography. *Prerequisite:* THEA 2420, 2440. (Offered fall semester of alternate years)

**4260. Intermediate Dance Composition. 2-3 (Max. 3).** *Prerequisites:* THEA 4250 and consent of instructor. (Offered spring semester of alternate years)

**4330. History of American Musical Theatre. 3. [WC◀COM3]** History of the American Musical from its inception to today. Emphasis on developments and literature. *Prerequisites:* THEA 2010, 2020, 6 hours in theatre at the 3000-level. (Normally offered alternating fall semesters)

**4500. Advanced Playwriting. 3.** An intensive continuation of THEA 3500. Focuses on the creation, analysis and rewriting of play script(s), culminating in a public reading or performance of the script(s). *Prerequisite:* THEA 2030.

**4600. Teaching Theatre Artists: Service Learning in the Community. 3.** Focus on Service Learning in the Community. Students will have the opportunity to observe various settings in the community of development of

theatre program. Some areas of observation and practicum include drama/theatre-in-education, community-issue-focused-theatre, and theatre with special populations, crisis prevention, drama therapy, Preventive Medical Agencies, etc. *Prerequisite:* THEA 1100.

**4700. Auditioning and Careers in Dance.**

**1.** Designed for dance majors as a culminating course in preparation for final semester auditions and applications for companies and graduate schools. Through this course, students will set career goals, create an audition portfolio, and gain exposure to the many challenges and opportunities in dance. *Prerequisites:* senior standing, THEA 1021, and one semester of THEA 4010 or 4030.

**4710. Advanced Scene Study. 1-3 (Max. 6).** Involves intensive work at an advanced level dealing with individual actor's problems through the medium of scene study. *Prerequisite:* THEA 3740. (Normally offered spring semester of alternate years)

**4720. Auditioning and Professional Issues. 3.** Introduces actors to process of finding, preparing and executing successful audition material, including monologues, songs and dance combinations. Exposes actors to business aspects of the theatre world, including resumes, photos, contracts, unions, internships, apprenticeships, Equity Membership Candidacy programs, URTA's and professional actor training graduate programs. Culminates preparation for final semester auditions for the company/school of choice. *Prerequisites:* THEA 1100, 3730 and 3740. (Normally offered fall semester)

**4730. Movement for Actors. 2.** An exploration of the underlying physical skills of actors as well as the art of physical acting and non-verbal storytelling. We will be using a mix of Viewpoints, LeCoq, Suzuki, and other practitioners' contributions, including Mask, Mime, Clowning, Devised Theatre and more. *Prerequisite:* THEA 1100 and 3720. (Normally offered alternating spring semesters)

**4750. Computer Aided Design II. 3.** Gives design and Technical students advanced training in AutoCAD and Softplot. Also explores methods for effectively transferring files and data between these two programs, and incorporating spreadsheet programs such as Microsoft Excel to improve efficiency. *Prerequisites:* THEA 2250, THEA 2800.

**4770. Summer Theatre. 1-3 (Max. 6).** Offers credit for participation in the Wyoming Summer Theatre program in all phases of production. Offered for S/U only. *Prerequisites:* 12 hours in theatre and consent of instructor. (Offered summer session)

**4800. Stage Lighting-Production. 3.** Explores design and execution of lighting for theatrical production. Includes practical laboratory work with Theatre & Dance productions. *Prerequisite:* THEA 2800, 2900, and 3805. (Normally offered alternating spring semesters)

**4810. Advanced Scenic Design. 3.** Explores alternate styles of scenic design in the realization of a design for a complete stage setting. Emphasis in course work will be on creating the portfolio. *Prerequisite:* THEA 3810. (Offered alternating spring semesters)

**4820. Directing I. 3.** Tools course. Focuses on basic pictorial and blocking skills of the director. Includes in-class exercises that cover structural and character analysis of play scripts, blocking annotation and prompt scripts, developing ground plans, creating compositions with emphasis, focus and balance, and employing movement as a dynamic tool. Requires two outside directing projects with verbal evaluations of all project work. *Prerequisites:* THEA 2010, 2020, 3730, and 3810. (Normally offered fall semester)

**4830. Directing II. 3.** Focuses on creative process of developing directorial concepts, establishing the world and style of the play, working with the actor, and functioning as a designer. Includes exercises that analyze different directorial approaches, as well as the audition and casting process. Culminates one-act mounted production performed before invited audience. *Prerequisites:* THEA 4820 and written permission of instructor. (Normally offered alternating spring semesters)

**4845. Costume Fit and Alteration. 3.** Focuses on fitting modern clothing and historical costumes to individuals. Students learn how to identify fit issues in a fitting, make the proper corrections and fit the garment again. Students use a combination of previously constructed garments and also pattern garments to fit. *Prerequisite:* FCSC 3174 (4170) or FCSC 3175.

**4850. Stage Costuming II. 3.** Explores costume design, emphasizing various rendering techniques. Emphasis is placed on the portfolio. *Prerequisite:* THEA 3820. (Normally offered spring semester)

**4880. Advanced Theatre Practice. 1-2 (Max. 4).** Encompasses individual problems in theatre or interpretation. Includes research, writing and practical work. *Prerequisites:* 12 hours in theatre and consent of instructor. (Offered both semesters)

**4930. Theatre History I. 3. [WC◀COM3]** First semester of a one-year series. Surveys theatrical and dramatic practices from origins of Western European theatre to the theatre of the avant-garde. Specifically focuses on the climate

of ideas and theoreticians, theatrical practitioners and audiences. *Prerequisites:* THEA 2010, 2020, 6 hours in theatre at 3000-level. (Normally offered alternating fall semesters)

**4940. Theatre History II. 3.** Second semester of a one-year series. Continues THEA 4930. *Prerequisite:* THEA 4930. (Normally offered alternating spring semesters)

**4950. Senior Thesis. 3.** Encompasses senior research project under faculty member guidance and supervision. *Prerequisite:* senior standing.

**4960. Senior Project. 1-3 (Max. 3).** Exercise in the practical application of production, centered on a UW production, either main stage or studio. It may deal with design in scenery, costumes, properties, sound, makeup, playwriting, technical direction, directing, dance pedagogy, or choreography. The project is intended to be a "real" exercise in theatrical production.

**4990. Research in Theatre. 1-3 (Max. 6).** *Prerequisite:* 6 hours in area of research and consent of instructor.

## Zoology and Physiology

428 Biological Sciences Building,

(307)766-4207

FAX: (307)766-5625

Web site: [www.uwyo.edu/Zoology](http://www.uwyo.edu/Zoology)

Department Head: Donal Skinner

### Professors:

**MERAV BEN-DAVID**, B.S. Tel Aviv University 1984; M.S. 1988; Ph.D. University of Alaska 1996; Professor of Zoology and Physiology 2010, 2000.

**CRAIG W. BENKMAN**, B.A. University of California at Berkeley 1978; M.S. Northern Arizona State University 1981; Ph.D. State University of New York at Albany 1985; Robert Berry Professor of Ecology, Professor of Zoology and Physiology 2004.

**HAROLD L. BERGMAN**, B.A. Eastern Michigan University 1968; M.S. 1971; Ph.D. Michigan State University 1973; Director SENR/IENR 1997; Professor of Zoology and Physiology 1984, 1975.

**FRANCIS W. FLYNN**, B.A. University of Colorado, Boulder 1973; M.A. Northern Arizona University 1977; Ph.D. Kansas State University 1981; Professor of Zoology and Physiology 2001.

**WILLIAM A. GERN**, B.A. Western State College 1971; M.A. 1973; Ph.D. University of Colorado Boulder 1976; Professor of Zoology and Physiology 1989, 1979.

**ROBERT O. HALL JR.**, B.S. Cornell University 1989; Ph.D. University of Georgia 1996; Professor of Zoology and Physiology 2010, 1998.

**PAULA M. LUTZ**, B.S. University of Missouri-Rolla 1976; Ph.D. Duke University 1981; Dean, College of Arts and Sciences 2013; Professor of Zoology and Physiology 2013.

**CARLOS MARTINEZ del RIO**, B.Sc. Universidad Nacional de Mexico 1984; Ph.D. University of Florida 1990; Professor of Zoology and Physiology 2004, 2000.

**DAVID B. MCDONALD**, A.B. Harvard College 1973; Ph.D. University of Arizona 1987; Professor of Zoology and Physiology 2010, 1996.

**FRANK J. RAHEL**, B.A. Kenyon College 1974; M.S. University of Wisconsin 1977; Ph.D. 1982; Professor of Zoology and Physiology 1998, 1985.

**ROBERT S. SEVILLE**, B.S. San Diego State University 1981; M.S. University of Wyoming 1987; Ph.D. 1992; Professor of Zoology and Physiology 2011, 1995.

**DONAL C. SKINNER**, B.S. Rhodes University 1987, B.S. (Hons.) University of the Witwatersrand 1988; Ph.D. University of Cambridge 1993; Professor of Zoology and Physiology 2012.

### Associate Professors:

**MICHAEL E. DILLON**, B.S. University of Texas, Austin 1998; Ph.D. University of Washington 2005; Associate Professor of Zoology and Physiology 2015, 2009.

**JACOB R. GOHEEN**, B.S. Kansas State University 1998; M.S. Purdue University 2002; Ph.D. University of New Mexico 2006; Associate Professor of Zoology and Physiology 2015, 2010.

**MATTHEW J. KAUFFMAN**, B.A. University of Oregon 1992; Ph.D. University of California, Santa Cruz 2003; Associate Professor of Zoology and Physiology 2014, 2006.

**JONATHAN F. PRATHER**, B.S. University of Virginia 1995; Ph.D. Emory University 2001; Associate Professor of Zoology and Physiology 2015, 2009.

**QIAN-QUAN SUN**, B.Sc. Shandong Normal University 1990; M.S. 1993; Ph.D. St. Andrews University 1998; Associate Professor of Zoology and Physiology 2010, 2004.

**CHARLES J. WOODBURY**, B.S. Arizona State University 1982; Ph.D. State University of New York at Stony Brook 1989; Associate Professor of Zoology and Physiology 2008, 2003.

### Assistant Professors:

**SARAH BENSON-AMRAM**, B.A. Cornell University 2001; Ph.D. Dual Degree Michigan State University 2011; Assistant Professor of Zoology and Physiology 2014.

**MATTHEW D. CARLING**, B.S. University of Michigan 1997; M.S. University of Idaho 2002; Ph.D. Louisiana State University 2008; Assistant Professor of Zoology and Physiology 2011.

**ANNA D. CHALFOUN**, B.A. Smith College 1995; M.S. University of Missouri-Columbia 2000; Ph.D. University of Montana-Missoula 2006; Assistant Professor of Zoology and Physiology 2011.

**BRIAN D. CHERRINGTON**, B.A. Washington University 1996; M.S. Colorado State University 2001; Ph.D. 2005; Assistant Professor of Physiology 2011.

**HAYLEY C. LANIER**, B.S. University of Kansas 2004; Ph.D. University of Alaska, Fairbanks 2010; Assistant Professor of Zoology and Physiology 2013.

**AMY M. NAVRATIL**, B.S. Colorado State University 1999; Ph.D. 2005; Gardner-Fiske Assistant Professor of Physiology 2011.

**KARA PRATT**, B.A.S. University of Delaware; Ph.D. Brandeis University 2004; Assistant Professor of Zoology and Physiology 2011.

**STEPHEN W. SANTORO**, B.S. University of Wyoming 1994; Ph.D. Scripps Research Institute 1999; Assistant Professor of Zoology and Physiology 2014.

**COREY E. TARWATER**, B.S. University of California, Davis 1999; M.S. University of Illinois, Urbana-Champaign 2006; Ph.D. 2010; Assistant Professor of Zoology and Physiology 2015.

**ANNIKA W. WALTERS**, B.A. Princeton University 2002; M.S. Yale University 2006; Ph.D. 2009; Assistant Professor of Zoology and Physiology 2011.

### Senior Academic Professional Lecturers:

**MARGARET J. FLANIGAN**, B.Sc. University of Strathclyde 1984; Ph.D. University of the Witwatersrand 1993; Senior Academic Professional, Zoology and Physiology 2015, 2003.

### Senior Academic Professional Research Scientist:

**ZHAOJIE ZHANG**, B.S. Shandong University 1985; M.S. 1988; Ph.D. University of Oklahoma 1999; Director, Microscopy Core Facility, University of Wyoming 2001; Senior Research Scientist in Zoology and Physiology 2012.

**Senior Academic Professional Research Scientist:**

**AMY C. KRIST**, B.A. State University of New York at Potsdam 1991; Ph.D. Indiana University 1998; Senior Research Scientist, Zoology and Physiology 2015, 2004.

**Professors Emeritus:**

Robert W. Atherton, Steven W. Buskirk, Zoltan M. Fuzessery, Robert P. George, Henry J. Harlow, Wayne A. Hubert, Robert M. Kitchin, J.A. Lillegraven, Frederick G. Lindzey, James R. Lovvorn, Graham Mitchell, James D. Rose, Joan Smith-Sonneborn

**Academic Professional Lecturer**

**Emeritus:**

Jane Beiswenger

**Wyoming Cooperative Fish and Wildlife Research Unit**

**Unit Leader:** Matthew W. Kauffman

**Assistant Unit Leader for Fisheries:** Annika W. Walters

**Assistant Unit Leader for Wildlife:** Anna D. Chalfoun

The Department of Zoology and Physiology offers a variety of courses in the biological sciences that encompass many aspects of animal form, function, and biology.

Whether you are interested in the intricacies of cell biology or the complexities of ecosystem functioning and whether you want to become a wildlife biologist or a physician, we offer a major that will suit your needs. Students can choose from four undergraduate degrees: biology, physiology, wildlife and fisheries biology and management, or zoology. Course requirements for each degree are detailed on our website: [www.uwyo.edu/zoology](http://www.uwyo.edu/zoology).

**Undergraduate Degrees**

**Biology Major**

The Biology major is an interdepartmental program that provides a broad education in biological sciences. It enables students to combine courses in biology, botany, zoology, physiology, and other biological sciences to meet the requirements of the major. On completion of the core requirements for the major, specific courses selected to complete the major may vary according to students' interests and are worked out by consultations between student and adviser. The requirements for a bachelor's degree are outlined in the Biology section of this *Catalog* or see the web site at [www.uwyo.edu/biology](http://www.uwyo.edu/biology).

**Physiology Major**

Physiology is the study of how animals work: how they breathe, feed, interact with their environment, and carry out many other activities and functions. Physiology is the knowledge that the health sciences are built on and so is especially important for students who may be thinking of becoming medical practitioners, veterinarians or health care professionals. In addition to the University and College of Arts and Sciences requirements, a degree in physiology typically involves the following courses:

**Freshman and Sophomore Years**

Students take introductory courses in biology, chemistry, physics, and mathematics as these are essential for understanding physiological processes. Students begin the study of physiology with Human Systems Physiology which focuses on how the cardiovascular and respiratory systems function.

**Junior and Senior Years**

Students take Integrative Physiology, which is concerned with how the body regulates such functions as reproduction or blood glucose concentrations.

Students can specialize in an area of physiology they find particularly interesting. The department has strong expertise in neuroscience physiology, cell physiology, ecological and comparative physiology. For details, visit our web site.

At the end of this program students will have a thorough knowledge of physiology, will be well prepared to enter health sciences or graduate education, and will have a range of skills attractive to employers.

**Wildlife and Fisheries Biology and Management Major**

Wildlife and Fisheries Biology and Management is a professional degree designed to prepare students for state, federal, and other positions in resource management and conservation biology. The degree provides students with knowledge of the natural world, understanding of processes governing dynamics of wildlife and fish populations, as well as an appreciation of human-mediated effects on wildlife and fish populations. A student graduating with this degree will be familiar with the theory of resource management as well as with methods used to determine population status, habitat quality, and conservation. In Wyoming the abundance of wild animals and pristine

habitats provide a unique natural laboratory for studying the responses of wildlife and fish populations to changing climates and habitats.

In addition to the University and College of Arts and Sciences requirements, a degree in wildlife and fisheries biology and management typically involves the following:

**Freshman and Sophomore Years**

Students take introductory courses in biology, chemistry, physics, and mathematics as these provide essential tools for understanding ideas and processes in wildlife and fisheries biology and management.

Students begin the study of wildlife and fisheries biology and management by taking courses in resource management, natural history of vertebrates, physiology, genetics, and evolution, as these subjects provide the underlying principles of population dynamics and the mechanisms of evolution.

**Junior and Senior Years**

Students can elect to concentrate in those areas of wildlife and fisheries biology and management they find most interesting and can specialize in a terrestrial or aquatic option. For details, see our web site.

A student graduating with a degree in WFBM will have comprehensive knowledge of wildlife and fisheries biology and management, will have earned a degree that is compatible with the requirements for professional certification with the American Fisheries Society or the Wildlife Society, and will have a range of knowledge and skills that are valuable to potential employers.

**Zoology Major**

Zoology is the study of animals: their structure, physiology, development and evolution. One of the enduring fascinations of zoology is that we can learn so much about ourselves and our environment by studying what our fellow creatures do.

In addition to the University and College of Arts and Sciences requirements, a degree in zoology typically involves the following courses:

**Freshman and Sophomore Years**

Students take introductory courses in biology, chemistry, physics, and mathematics as these provide essential tools for understanding zoological ideas and processes.

Students begin the study of zoology by taking courses in anatomy, physiology, genetics, ecology, and evolution, as these subjects



provide the underlying principles of the mechanisms of evolution, and animal structure, function, and ecology.

### **Junior and Senior Years**

Students take courses in five main areas: invertebrate zoology, ichthyology, herpetology, ornithology, and mammalogy. For details of these and other courses see our web site.

At the end of this program students will have a comprehensive knowledge of zoology, will be well prepared for graduate education, and will be equipped to enter any of the many employment opportunities that are available.

### **Learning Outcomes for Undergraduates**

The learning outcomes that direct the teaching of the department's degrees and which we expect our graduates to have acquired are:

- Competence in basic sciences;
- Competence in the content of the specific courses that constitute the principal knowledge of the degree;
- Ability to comprehend, analyze, and interpret biological data where appropriate; and
- Ability to synthesize information from the biological literature, and communicate it effectively in writing or orally.

### **Undergraduate Minor**

Minors in zoology, physiology, wildlife fisheries biology management, and neuroscience are offered. Contact the department for further information or see the web site [www.uwyo.edu/zoology](http://www.uwyo.edu/zoology).

## **Graduate Study**

The Department of Zoology and Physiology offers programs leading to the master of science and the doctor of philosophy in zoology and physiology. We also participate in graduate programs through the Neuroscience Program and the Program in Ecology.

### **Program Specific Admission Requirements**

Admission is open to all students who meet the minimum requirements set forth in the admissions section of this *Catalog*.

Research and teaching assistantships are available for graduate students working toward the M.S. or Ph.D. degrees. Applicants can

apply for this financial assistance at the time they apply for admission to graduate standing. Applications must be completed by February 15 in order to be considered for the following academic year.

Information on how to apply to the graduate program in the Department of Zoology and Physiology is detailed on our web site. Begin by identifying a faculty member in our department whose research interests are similar to yours. We will only consider an application if a faculty member has indicated a willingness to serve as the student's adviser. After finding a potential adviser, e-mail a completed departmental application form, a copy of your curriculum vitae, copies of college transcripts, recommendation letters and GRE scores to him or her. Our graduate admissions committee will review all applications and make decisions on admission based on the availability of funding and a commitment from a faculty member to serve as the adviser. Students recommended for admission will then be asked to fill out an application to the University of Wyoming and pay a non-refundable application fee.

Consult the website, [www.uwyo.edu/zoology](http://www.uwyo.edu/zoology), to find out about faculty research.

### **Program Specific Degree Requirements**

#### **Master's Program**

##### **Plan A (thesis)**

Includes 26 hours of coursework and 4 hours of thesis research.

Applicants should have at least 20 semester hours of undergraduate work in zoology, physiology, or other areas of the biosciences and have completed introductory courses in mathematics, chemistry, and in at least one other natural or physical science. Early in the second semester the student must file a program of study with the university and have a graduate committee appointed. Plan A candidates shall orally defend the thesis before the graduate committee.

All M.S. candidates will be required to complete credit in two graduate seminars. A student may enroll in more than one of these required seminars during one semester or academic year.

After two semesters in the department, a Plan A master's candidate may request permission from the department's graduate advisory board to proceed directly to the Ph.D. degree; however, such a bypass is granted only by the department head after considering recommendations from the graduate advisory board.

Zoology and physiology may be used as a field by a candidate working for the interdisciplinary master of science in natural science in the College of Arts and Sciences and the College of Education.

#### **Plan B (non-thesis)**

Includes 30 hours of coursework.

The program for the Plan B is established by the student and a faculty adviser and must be approved by the department head during the student's second semester or summer session.

The graduate committee will require the candidate to take a written examination. An oral examination may also be required. The final examination is comprehensive, covering all areas of zoology, but emphasizing one major area.

#### **Doctoral Program**

This is a 72 hour program.

A Ph.D. applicant must have 20 hours of undergraduate work in zoology, physiology, or other areas of biology and also have completed substantial undergraduate work in other sciences. Under exceptional circumstances, a student with an undergraduate major in a scientific discipline other than biology may be admitted. After the Ph.D. student has completed two semesters of graduate work, s/he must be approved for continued work toward the doctorate by the graduate advisory board. This board can reconsider a candidate thereafter if it so desires.

A graduate committee shall be appointed for the individual student no later than the third semester. After consultation with the student, this committee will prescribe special requirements (courses, minors, research tools, etc.) that must be fulfilled. At this time, the graduate committee shall consult with the candidate on the proposed research and shall identify the subject matter areas to be included in the preliminary examination. The preliminary examination will consist of a written research proposal, its oral defense, and a written and oral preliminary examination. When training outside zoology and physiology is specified by the committee, certification of satisfactory completion of the requirement will be made by the appropriate department.

In addition to the general university requirements for the Ph.D. degree, the department requires the following:

The coursework program should include work in a discipline outside the department, generally in the sense of a minor, to be identified in consultation with the graduate committee.

The preliminary examination consisting of written and oral portions should be taken no later than midterm of the fourth semester in residence. The graduate committee will certify satisfactory performance for the preliminary examination.

The dissertation must be received by each member of the graduate committee three weeks before the final dissertation seminar. As oral defense of the dissertation, the candidate will deliver a formal 50 minute seminar on original research from the dissertation. The seminar will be followed by an examination by the graduate committee.

Some time during their degree program, all Ph.D. candidates will be required to complete credit in three graduate seminars. A student may enroll in more than one of these required seminars during one semester or academic year.

All candidates for the Ph.D. degree shall be required to teach for one semester during their program.

The dissertation may be written in a format suitable for publication in a journal and the usual extensive literature review, description of study sites, technical details, raw data, supporting figures, charts, and photographs should be included in a well-organized appendix. (See also format requirements by the university.)

## Zoology (ZOO)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**1101. First-Year Seminar. 3. [(none)♦FYS]**  
**2040. Human Anatomy. 3. [SB♦(none)]**  
 Study of human structure in terms of its microscopic and gross anatomy. Provides students with adequate background to study human physiological function. The corresponding course, to be taken concurrently, is ZOO/KIN 2041. Cross listed with KIN 2040. *Prerequisite:* LIFE 1010.

**2041. Human Anatomy Laboratory. 1. [SB♦(none)]**  
 A laboratory study of human structure in terms of human microscopic and gross anatomy. This laboratory course is designed to provide students with an adequate background to study human physiology and kinesiological function. *Prerequisite:* KIN/ZOO 2040 or concurrent enrollment.

**2450. Principles of Fish and Wildlife Management. 3.** Emphasizes principles of habitat and population biology and management, human dimensions of wildlife management, as well as law and policy. Cross listed with ENR 2450. *Prerequisites:* LIFE 1010 and 2022. (Offered spring semester)

**3010. Vertebrate Anatomy, Embryology, and Histology. 4.** Provides a comprehensive overview of vertebrate anatomy. The structural organization, embryological derivation, and histological organization of the major organ systems will be emphasized. The evolution and functional organization of anatomical structure will also be emphasized. Includes laboratory sessions. Fulfills degree requirement in physiology subsection for zoology major. *Prerequisites:* LIFE 2022 or equivalent, and a semester of chemistry.

**3021. Physiology of Exercise. 4.** Applies physiological principles to human physical activities. Emphasizes interaction of neuromuscular, circulatory and respiratory mechanisms as affecting, and affected by, immediate exercise situation and physical training. Includes laboratory. Cross listed with KIN 3021. *Prerequisites:* QA, KIN/ZOO 2040 and 3115; minimum 2.5 GPA. (Offered fall and spring semesters)

**3115. Human Systems Physiology. 4.** Covers the fundamental function(s) of the human body systems, from cells and tissues through organs and systems, focusing also on biological communication and homeostasis. Students learn how to interpret physiological data. Includes laboratory and tutorial sessions. Fulfills degree requirement in physiology subsection for zoology major. Cross listed with KIN 3115. *Prerequisites:* At least ((C in CHEM 1020 or CHEM 1050) or B in CHEM 1000) and C in LIFE 1010.

**3600. Principles of Animal Behavior. 3.** Intensively introduces scientific study of animal behavior. Utilizes evolutionary, ecological and physiological approach. *Prerequisite:* introductory course in zoology, biology or psychology. (Normally offered spring semester)

**4100. Scientific Communication. 3. [WC,L♦COM3]**  
 This course is designed to provide intensive instruction in written, oral, and digital communication for zoology and physiology, biology, and botany majors. The course teaches students to communicate and execute research using practices common in the biological sciences. Cross listed with BOT 4100. *Prerequisites:* COM1, COM2, and concurrent or prior upper division BOT, ZOO, or LIFE course.

**4110. HIV/AIDS: The Disease and the Dilemma. 3.** Explores the basic biology of the HIV virus, and its effects upon the human body, the magnitude of the global HIV/AIDS pandemic, treatment and prevention of AIDS, and the social, political, economic, and legal issues of HIV/AIDS. *Prerequisite:* LIFE 1003 or LIFE 1010.

**4125 [3120]. Integrative Physiology. 4.**  
 Examines how functional organ systems are coordinated and integrated to establish and maintain health. It considers, among others, the functions of the endocrine and central nervous systems. Dual listed with ZOO 5125. *Prerequisites:* grade of C or higher in ZOO 3115; and/or a Pharmacy 1 standing.

**4190 [4230]. Comparative Environmental Physiology. 4.** Studies and interprets principles of physiology which adapt animals to various environmental constraints. Introduces discipline which has risen between traditional fields of physiology and ecology and provides understanding of animal distribution and survival. Fulfills degree requirements in physiology subsection for the zoology major. Dual listed with ZOO 5190. *Prerequisites:* LIFE 2022 and one year of chemistry. (Offered spring semester)

**4280. Introduction to Neuroscience. 3.**  
 Examines the basic electrical properties of neurons and from there identifies determinants of brain development, how neuronal "circuits" are formed and how these neuronal systems enable the processing of sensory information, coordinated movement, adaptation to the environment, and other complex functions (e.g., sleep, sex). Dual listed with ZOO 5280. *Prerequisite:* ZOO 3115 or equivalent.

**4290. Neural Mechanisms Underlying Animal Behavior. 3.** Studies ways in which nervous systems of both invertebrates and vertebrates contribute to and control their behavioral repertoires. Focuses on aspects of sensory physiology with brief orientation to structure and function of nervous systems. Presents analysis neural control of movement. Includes laboratory demonstrations. *Prerequisite:* ZOO 3115 or equivalent.

**4300 [4720]. Wildlife Ecology and Management. 5.** Integrates concepts of vertebrate ecology with the art of wildlife management, stressing approaches to deal with the inherent uncertainty of managing populations. Strategies to increase or decrease populations of target species, tools used to determine population status (e.g., viability analysis, monitoring, habitat assessment), and ecosystem management approaches. Laboratory included. Dual listed with ZOO 5300. *Prerequisite:* LIFE 3400. (Offered fall semester)

**4310 [4730]. Fisheries Management. 3.** Acquaints students with theory and techniques of inland fisheries management. Includes methods of evaluating growth and production, rates of mortality and recruitment and use of yield models in fisheries biology. Includes laboratory and field exercises. Dual listed with ZOO 5310. *Prerequisite:* ZOO 4330. (Normally offered fall semester)

**4330 [4750]. Ichthyology. 3.** Anatomy, physiology and classification of fishes, emphasizing classification and identification of Wyoming fishes. Includes laboratory. Dual listed with ZOO 5330. *Prerequisite:* LIFE 2022. (Normally offered spring semester)

**4340. Developmental Biology and Embryology. 4.** Introduces study of vertebrate embryology and cellular differentiation. Includes gametogenesis, fertilization, blastulation and organogenesis, growth and differentiation, teratology, metamorphosis, regeneration and asexual reproduction. Emphasizes mechanisms that create form and regulate cellular differentiation. Dual listed with ZOO 5340. *Prerequisite:* one year of life sciences, one year of chemistry. (Normally offered spring semester)

**4350 [4780]. Ornithology. 3.** Acquaints students with classification, identification, morphology, distribution, natural history and ecology of the birds of North America. Includes laboratory. Dual listed with ZOO 5350. *Prerequisite:* LIFE 2022. (Offered spring semester)

**4370 [4790]. Mammalogy. 3.** Studies mammals of the world, emphasizing natural history, distribution, taxonomy, ecology and morphology of mammalian species. Includes laboratory. Dual listed with ZOO 5370. *Prerequisite:* LIFE 2022. (Offered fall semester)

**4380. Herpetology. 3.** Introduces the ecology, behavior, morphology, evolution, systematics and conservation of reptiles and amphibians. Dual listed with ZOO 5380. *Prerequisite:* LIFE 2022.

**4390. Environmental Toxicology. 3.** Explores the disciplines of aquatic and wildlife toxicology from environmental, chemical, and regulatory perspectives. Emphasis on standard environmental toxicology testing methods, field studies, statistical analyses, and mechanistic principles, with discussions of contemporary issues in the field. Dual listed with ZOO 5390.

**4400. Population Ecology. 3.** Explores quantitative ecology of animal populations, emphasizing theoretical and empirical work. Provides modern coverage of principles of population ecology for wildlife majors and others who expect to deal with ecological problems in their careers. Dual listed with ZOO

5400. *Prerequisites:* LIFE 1010, LIFE 3400 and STAT 2050 or consent of instructor. (Offered spring semester)

**4415. Behavioral Ecology. 3.** Applies empirical and theoretical approaches to ecological and evolutionary underpinnings for behaviors ranging from foraging and predation to social grouping and mating systems. Emphasizes comparative analyses (what phylogenetic patterns exist across diverse species?) as well as genetic/fitness benefits (how do individuals benefit from apparently puzzling behaviors?). Dual listed with ZOO 5415. *Prerequisites:* ZOO 3600 or LIFE 3400 or permission of the instructor. (Offered fall semester)

**4420. Conservation Biology. 3.** Addresses the broadest environmental issues facing society (habitat loss, invasion, overexploitation) and the mechanisms driving them, with particular attention to the Intermountain West. Through computer exercises, students also learn how to evaluate conservation efforts and make management recommendations. Cross listed with BOT/ENR 4420. *Prerequisites:* LIFE 3400 and one of the following: ENR 3500, STAT 2050, or STAT 2070.

**4425. Genetic Markers. 3.** Overview of the use of genetic, molecular markers for the analysis of natural populations of plants and animals. Approaches range from individual identification to systematics, with a core focus on populations. Dual listed with ZOO 5425. *Prerequisite:* LIFE 3050.

**4430. Limnology Laboratory. 2.** Utilizes basic field techniques in limnology. Emphasizes analysis and interpretation of data obtained from field and laboratory exercises. *Prerequisite:* concurrent enrollment in ZOO 4440. (Offered fall semester)

**4440. Limnology. 3.** Studies ecology of inland waters; biological, chemical and physical features of lakes and streams. *Prerequisites:* LIFE 1010, 3400 and one year of chemistry. (Offered fall semester)

**4540. Invertebrate Zoology. 4.** Studies major invertebrate phyla of the animal kingdom. Studies each phylum with respect to morphological and taxonomic characteristics; functional and evolutionary relationships; environmental adaptations; life cycles of representative types. Includes laboratory. Dual listed with ZOO 5540. *Prerequisite:* LIFE 2022. (Offered fall semester)

**4550. Wetland Ecology. 3.** Study of the function of inland and coastal wetlands: hydrology, biogeochemistry, microbial ecology, distribution and production of algae and macrophytes, decomposition, contaminant processing, ecology of invertebrates and vertebrates, and food-web structure. Roles of wetlands in aquatic and

terrestrial landscapes, wetland classification schemes, and conservation programs. One-day field trip required. Dual listed with ZOO 5550. *Prerequisites:* LIFE 1010; LIFE 2022 or 2023; CHEM 1030.

**4560. Quantitative Conservation Biology. 4.** Covers the application of ecology and genetics to conservation biology, emphasizing the use of mathematical analysis and quantitative thinking. Includes mathematical homework, discussion sections, computer labs, and independent student projects. Dual listed with ZOO 5560. *Prerequisite:* approval of instructor.

**4670. Cell Physiology. 4.** Focuses on the cellular mechanisms, functions, and pathways that define the cell as the fundamental living unit. Topics include metabolism, second messengers, cell ultrastructure, membrane excitability, transport physiology, contractile systems, cell division, and programmed cell death. Dual listed with ZOO 5670. *Prerequisites:* MOLB 3610, LIFE 3600.

**4735. [5730] Advanced Topics in Physiology. 1-4 (Max. 12).** Designed to cover advanced topics in Physiology for students specializing in Physiology or related fields. Examples of topics include endocrinology, cardiovascular, renal, neurological, respiratory, and metabolic physiology. Integrative topics (e.g. circadian rhythms, thermal stress) may also be included. Dual listed with ZOO 5735. *Prerequisites:* ZOO 3115 and 4125 or equivalent as approved by the instructor.

**4740. Fish Culture and Nutrition. 3.** Studies methods in artificial propagation of fishes. Includes spawning, hatchery methods, water quality requirements and nutritional requirements. Includes laboratory. *Prerequisite:* LIFE 2022, CHEM 1020. (Offered fall semester)

**4900. Problems. 1-8 (Max. 8).** For advanced students. Studies some particular problem or phase of zoology, or presents reviews and discussions of current advancement in zoological investigations. Content is arranged to suit individual needs of students. Satisfactory/Unsatisfactory only. *Prerequisites:* courses necessary to pursue the problem selected; prior written consent of the instructor.

**4970. Internship in Wildlife Management. 1 (Max. 1).** Provides practical field experience in resource management for undergraduate credit. Satisfactory/unsatisfactory only. *Prerequisite:* consent of instructor.

**4971. Internship in Zoology and Physiology. 1-3 (Max. 6).** Provides practical experience in selected biological fields by working with a professional to help bridge the gap between academic and the world of work. Satisfactory/Unsatisfactory only. *Prerequisite:* consent of instructor.

**4975. Practicum in Laboratory Instruction. 1-3 (Max. 6).** For advanced students. Students will assist GAs and professors in laboratory preparation and demonstration in undergraduate teaching labs. Satisfactory/Unsatisfactory only. *Prerequisite:* consent of instructor.

**5060. Fundamental Concepts in Evolution. 3.** Explores fundamental concepts in evolutionary biology including evolutionary ecology, population genetics, and speciation with an emphasis on both theoretical frameworks and practical applications. Discussion included. Cross listed with ECOL/BOT 5060. *Prerequisite:* graduate student in good standing.

**5050. Statistical Methods for the Biological Science. 3.** General statistical analyses and their application to the biological and behavioral sciences. Analysis of variance, regression and correlation methods are studied from a data analytic perspective, emphasizing the conceptual understanding of where and when these techniques should be used and the interpretation of their results. Available computer programs will be utilized. Credit cannot be earned in more than one of the following courses: STAT 2020, 3050, 5050, 5060, 5070. Cross listed with STAT 5050. *Prerequisite:* one course in statistics (all introductory courses except 2000).

**5100. Structure and Function of the Nervous System. 4.** Aimed at understanding the structure and interconnections within the nervous system, and how structure gives rise to the complex functions mediated by the brain. This is an essential feature of neuroscience. Covers gross anatomy of the central and peripheral nervous system, followed by detailed consideration of the divisions of the brain and their functional significance. Cross listed with NEUR 5100. *Prerequisites:* admission to the graduate neuroscience program, or graduate standing in another related program, or permission for undergraduate enrollment following discussion with the instructor.

**5125. Integrative Physiology. 4.** Examines how functional organ systems are coordinated and integrated to establish and maintain health. Considers, among others, the functions of the endocrine and central nervous systems. Dual listed with ZOO 4125. *Prerequisites:* C Grade or higher in ZOO 3115; and/or a Pharmacy 1 standing; Graduate students must have permission from the instructor.

**5190. Comparative Environmental Physiology. 4.** Studies and interprets principles of physiology which adapt animals to various environmental constraints. Introduces the discipline which has risen between the traditional fields of physiology and ecology and provides

an understanding of animal distribution and survival. Dual listed with ZOO 4190. *Prerequisite:* LIFE 2022 or 2023 and 1 year of chemistry.

**5280. Introduction to Neuroscience. 3.** Examines the basic properties of neurons and from there identifies determinants of brain development and how neuronal circuits are formed. How neuronal circuits underlie processing sensory information, coordinated movement, complex functions (e.g. sleep, learning) and homeostasis are discussed. Cross listed with NEUR 5280; dual listed with ZOO 4280. *Prerequisite:* ZOO 3115 or equivalent.

**5300. Wildlife Ecology and Management. 1-5 (Max. 6).** Concepts of vertebrate ecology integrated with the art of wildlife management, stressing approaches to deal with the inherent uncertainty of managing populations. Strategies to increase or decrease populations of target species, tools used to determine population status (e.g. viability analysis, monitoring, habitat assessment), and ecosystem management approaches are discussed. Lab included. Dual listed with ZOO 4300. *Prerequisite:* LIFE 3400.

**5310. Fisheries Management. 3.** Acquaints students with theory and techniques of inland fisheries management. Includes methods of evaluating growth and recruitment, and the use of yield models in fisheries biology. Laboratory and field exercises included. Dual listed with ZOO 4310. *Prerequisite:* ZOO 4330.

**5330. Ichthyology. 3.** Studies anatomy, physiology, and classification of fishes, emphasizing classification and identification of Wyoming fish. Includes laboratory. Dual listed with ZOO 4330. *Prerequisite:* LIFE 2022 or 2023.

**5340. Developmental Biology and Embryology. 4.** Introduces study of vertebrate embryology and cellular differentiation. Includes gametogenesis, fertilization, blastulation and organogenesis, growth and differentiation, teratology, metamorphosis, regeneration, and asexual reproduction. Emphasizes mechanisms that create form and cellular differentiation. Dual listed with ZOO 4340. *Prerequisite:* one year of life science or one year of chemistry.

**5350. Ornithology. 3.** Acquaints students with classification, identification, morphology, distribution, natural history, and ecology of the birds of North America. Laboratory included. Dual listed with ZOO 4350. *Prerequisite:* LIFE 2022.

**5370. Mammalogy. 3.** Studies mammals of the world, emphasizing natural history, distribution, taxonomy, ecology, and morphology of mammalian species. Includes laboratory. Dual listed with ZOO 4370. *Prerequisite:* LIFE 2022 or 2023.

**5380. Herpetology. 3.** Introduces the ecology, behavior, morphology, evolution, systematics and conservation of reptiles and amphibians. Dual listed with ZOO 4380. *Prerequisite:* LIFE 2022.

**5390. Environmental Toxicology. 3.** Explores the disciplines of aquatic and wildlife toxicology from environmental, chemical, and regulatory perspectives. Emphasis on standard environmental toxicology testing methods, field studies, statistical analysis, and mechanistic principles, with discussions of contemporary issues in the field. Dual listed with ZOO 4390. *Prerequisites:* LIFE 3400, CHEM 1030, or STAT 2050.

**5405. Winter Ecology of the Yellowstone Ecosystem. 2.** Winter Ecology emphasizes the effects of winter abiotic conditions on organisms and organismal adaptations. Energy flux, snowpack physics, organismal adaptations, avalanche awareness, and the influence of winter on wildlife management are emphasized through lectures and field laboratories. Students will develop an independent research project and present their results. *Prerequisite:* graduate standing.

**5400. Population Ecology. 3.** Explores quantitative ecology of animal populations, emphasizing theoretical and empirical work. Provides modern coverage of principles of population ecology for wildlife majors and others who expect to deal with ecological problems in their careers. Dual listed with ZOO 4400. *Prerequisites:* LIFE 1010, 3400 and STAT 2050.

**5415. Behavioral Ecology. 3.** Behavioral ecology applies empirical and theoretical approaches to ecological and evolutionary underpinnings for behaviors ranging from foraging and predation to social grouping and mating systems. Emphasizes comparative analyses (what phylogenetic patterns exist across diverse species?) as well as genetic/fitness benefits (how do individuals benefit from apparently puzzling behaviors?). Dual listed with ZOO 4415. *Prerequisite:* ZOO 3600 or LIFE 3400.

**5420. Ecological Inquiry. 3.** Addresses basic ecological concepts and natural resource management issues in the Greater Yellowstone Ecosystem (GYE). Emphasis will be placed on developing critical thinking skills and exploring the effects of resource management policy and actions. Course direction will involve moving from a known facts way of thinking in to realm of evaluating effects of human management of the GYE. *Prerequisites:* LIFE 2022, 3400, and graduate standing.

**5425. Genetic Markers. 3.** Overview of the use of genetic, molecular markers for the analysis of natural populations of plants and

animals. Approaches range from individual identification to systematics, with a core focus on populations. Dual listed with ZOO 4425. *Prerequisite:* LIFE 3050.

**5430. Ecology of the Greater Yellowstone Ecosystem. 3.** Covers plant and animal community ecology from both a qualitative and quantitative perspective. Topics include: community interaction of plants and animals; community dynamics, succession, and disturbance; basic data collection and statistical analysis of habitat association data; and the effect of abiotic factors on community structure. *Prerequisite:* LIFE 2022, 3400, and graduate standing.

**5540. Invertebrate Zoology. 4.** Studies invertebrate phyla of the animal kingdom. Studies each phylum with respect to morphological and taxonomic characteristics; functional and evolutionary relationships; environmental adaptations; life cycles of representative types. Includes laboratory. Dual listed with ZOO 4540. *Prerequisite:* LIFE 2022.

**5550. Wetland Ecology. 3.** Study of the function of inland and coastal wetlands: hydrology, biogeochemistry, microbial ecology, distribution and production of algae and macrophytes, decomposition, contaminant processing, ecology of invertebrates and vertebrates, and food-web structure. Roles of wetlands in aquatic and terrestrial landscapes, wetland classification schemes, and conservation programs. One-day field trip required. Dual listed with ZOO 4550. *Prerequisites:* LIFE 1010; LIFE 2022 or 2023; CHEM 1030.

**5560. Quantitative Conservation Biology. 4.** Covers the application of ecology and genetics to conservation biology, emphasizing the use of mathematical analysis and quantitative thinking. Includes mathematical homework, discussion sections, computer labs, and independent student projects. Dual listed with ZOO 4460. *Prerequisite:* approval of instructor.

**5600. Research in Physiology. 1-16 (Max. 16).** Opportunities are available for research in physiology and in animal behavior. Maximum credit not to exceed 8 hours for master's candidates and 16 hours for PhD candidates.

**5670. Cell Physiology. 4.** Focuses on the cellular mechanisms, functions, and pathways that define the cell as the fundamental living unit. Topics include metabolism, second messengers, cell ultrastructure, membrane excitability, transport physiology, contractile systems, cell division, and programmed cell death. Dual listed with ZOO 4670. *Prerequisite:* LIFE 3600.

**5685. Neurophysiology. 3.** Designed to investigate the structure and function of nervous systems, drawing information from both vertebrate and invertebrate organisms. Topics

such as sensory systems, motor coordination and central integrative mechanisms are covered in addition to the basic neurophysiology of nerve cells. The laboratory complements the lecture sequence. Cross listed with NEUR 5685. *Prerequisite:* one course in physiology, chemistry, physics.

**5690. Advanced Animal Behavior. 3.** An advanced consideration of research in, and theory of, animal behavior. *Prerequisite:* senior or graduate standing in zoology or psychology.

**5715. Seminar in Neuroscience. 2 (Max. 20).** A continuing seminar. All students in the graduate neuroscience program are expected to register for this seminar each semester. The interdisciplinary approach to the nervous system is used employing work from physiology, neuroanatomy and neurochemistry, psychology, pharmacology, and biochemistry. Cross listed with NEUR 5715. *Prerequisite:* admission to the graduate neuroscience program or graduate standing.

**5725. Transmission Electron Microscopy. 3.** With the emphasis on modern techniques, course prepares students via theory and technical experience to use transmission electron microscopy in biological and material science research. An individual research project is required. *Prerequisite:* consent of instructor.

**5735. Advanced Topics in Physiology. 1-4 (Max. 12).** Designed to cover advanced topics in Physiology for students specializing in Physiology or related fields. Examples of topics include endocrinology, cardiovascular, renal, neurological, respiratory, and metabolic physiology. Integrative topics (e.g. circadian rhythms, thermal stress) may also be included. Dual listed with ZOO 4735. *Prerequisites:* ZOO 3115 and 4125 or equivalent as approved by the instructor.

**5740. Biological Confocal Microscopy. 2.** With the advances of technology, confocal microscopy is an increasingly important tool for biological research. Teaches students the basic principles of confocal microscopy and its biological applications. This is a hands-on course and students have the chance to practice on a state-of-the-art confocal microscope.

**5750. Research: Ecology. 1-16 (Max. 16).** A wide variety of biotic communities, both terrestrial and aquatic, occur in Wyoming which afford excellent opportunities for ecological studies with responses of animals to the physical, chemical, and biotic factors of their environment. The research must be conducted under the supervision of a faculty member.

**5780. Advanced Limnology. 3.** A consideration of recent limnological work, emphasizing its relation and contribution to the

development of ecological theory. Laboratory provides training in advanced limnological work. *Prerequisite:* ZOO 4440.

**5820. Research in Vertebrate Fauna. 1-16 (Max. 16).** Wyoming affords unusual opportunities for the study of a wide variety of vertebrate animals. The taxonomy, distribution, and certain aspects of the life histories of these animals are still inadequately known and afford excellent opportunities for research. Numerous problems concerning the management of our game animals remain to be investigated. The research must be conducted under the supervision of a zoology faculty member.

**5840. Advanced Fisheries Management. 3.** Familiarizes students in wildlife management and ecology with the advanced methods and techniques in fisheries management. *Prerequisite:* ZOO 4310/5310 and consent of instructor.

**5890. Graduate Seminar. 1-4 (Max. 10).** Provides an opportunity for graduate students to critically evaluate publications on zoological research. *Prerequisite:* 20 hours of biological sciences.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

**5990. Internship. 1-12 (Max. 12).** *Prerequisites:* graduate standing.

## Neuroscience (NEUR)

**5100. Structure and Function of the Nervous System. 4.** Aimed at understanding the structure and interconnections within the nervous system, and how structure gives rise to the complex functions mediated by the brain. This is an essential feature of neuroscience. Covers gross anatomy of the central and peripheral nervous system, followed by detailed consideration of the divisions of the brain and their functional significance. Cross listed with ZOO 5100. *Prerequisites:* admission to the graduate neuroscience program, or graduate standing in another related program, or permission for undergraduate enrollment following discussion with the instructor.

**5160. Neurologic diseases: mechanisms and therapeutic approaches. 3.** We will use lectures, student presentations and discussions to learn about impacts, molecular mechanisms and prospects for effective therapy of some important neurologic diseases of man and animals. Disorder we will study will include chronic traumatic encephalopathy, Alzheimer's disease, prion diseases, stroke and epilepsy. Cross listed with PATB 5160. *Prerequisite:* Courses in neuroanatomy and biochemistry; graduate level standing.

**5280. Introduction to Neuroscience. 3.** Examines the basic properties of neurons and from there identifies determinants of brain development and how neuronal circuits are formed. How neuronal circuits underlie processing sensory information, coordinated movement, complex functions (e.g. sleep, learning) and homeostasis are discussed. Cross listed with ZOO 5280. *Prerequisite:* ZOO 3115 or equivalent.

**5685. Neurophysiology. 3.** Designed to investigate the structure and function of nervous systems, drawing information from both vertebrate and invertebrate organisms. Topics such as sensory systems, motor coordination and central integrative mechanisms will be covered in addition to the basic neurophysiology of nerve cells. Cross listed with ZOO 5685. *Prerequisite:* one course in physiology, chemistry, physics.

**5715. Seminar in Neuroscience. 1-2 (Max. 20).** A continuing seminar. All students in the graduate neuroscience program are expected to register for this seminar each semester. The interdisciplinary approach to the nervous system is used employing work from physiology, neuroanatomy and neurochemistry, psychology, pharmacology and biochemistry. Cross listed with ZOO 5715. *Prerequisites:* admission to the graduate neuroscience program or graduate standing.

**5800. Research in Neuroscience. 1-16 (Max.16).** The research must be conducted under the supervision of one of the neuroscience program faculty. Laboratory opportunities for research include neuroendocrinology, behavioral neuroscience, sensory neurophysiology, neuroanatomy, neuropharmacology, neurotoxicology, neural cell biology, and neurochemistry. *Prerequisite:* admission to the graduate neuroscience program or graduate standing.

**5887. Molecular Neuropharmacology. 3.** Focus on the molecularly-induced functional changes within the nervous system in normal and disease states. In addition, will provide a thorough explanation of the cellular and molecular actions of drugs on synaptic transmission and discuss the neurochemical basis of behavior. *Prerequisites:* PharmD current standing and instructor's permission or NEUR 5280.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5960. Thesis Research. 1-12 (Max. 24).** *Prerequisite:* advanced degree candidacy.

**5980. Dissertation Research. 1-12 (Max. 48).** *Prerequisite:* advanced degree candidacy.

The College of Business prepares students for careers by providing quality education in business disciplines, creating and disseminating knowledge, and assisting in Wyoming's economic development. The College of Business expects the highest level of integrity from our administration, faculty, staff, students, and alumni.

The College of Business grew from roots established in 1899 when the UW School of Commerce was founded. While the programs offered have changed over the years, the college remains firmly committed to academic excellence and positive student experiences.

The college has three academic departments: accounting; economics and finance; and management and marketing. The college also houses the College of Business Peter M. and Paula Green Johnson Career Center and Academic Advising Office which are instrumental in maintaining the college's link with the business world.

These units are committed to preparing all College of Business students to enter our rapidly-changing world. Successful graduates are fully prepared to compete in their chosen professions or in graduate school. More importantly, they are well-educated individuals prepared to live fulfilling lives, and to meet the challenges presented by the complex ethical, moral and cultural contexts of our times.

## College of Business Learning Outcomes

The College of Business expects that its graduates:

1. Understand the nature of the various disciplines within business and how these disciplines fit together.
2. Possess in-depth knowledge of his or her discipline and use this disciplinary knowledge to solve business problems.
3. Possess the professional skills and personal attributes necessary for a successful career in their chosen field.

## AACSB Accreditation

The business degree programs offered by the College of Business are accredited by AACSB-International. AACSB standards ensure that College of Business students are provided comprehensive, high-quality, well-

rounded degree programs. The "Common Course Work" and the "Advanced Business Standing Prerequisites" (ABS) described on the following pages have been developed to meet the AACSB accreditation standards. Per accreditation guidelines, non-College of Business majors are limited to 30 hours of business courses.

A minimum of 50% of COB courses required for the major must be taken from the degree-awarding institution.

## Programs of Study Undergraduate Degrees

### *Bachelor of Science*

- Accounting
- Business administration (online)
- Business economics
- Economics
- Finance
- Management
- Marketing

## Graduate Degrees

### *Master of Science*

- Accounting
- Economics
- Finance
- Dual Economics and Finance

### *Master of Business Administration*

### *Doctor of Philosophy*

- Economics
- Marketing with emphasis on sustainability

## Student Advising

### *Academic Advising*

All College of Business undergraduate students, except economics majors, are advised by professional academic advisers in the College of Business Academic Advising Office (COB/AAO) in room 175, Business Building. Economics students are advised by David Finnoff, room 229, Business Building.

### *Career Advising*

All career advising is conducted by College of Business faculty members and the Peter M. and Paula Green Johnson Career Center. Students are encouraged to request career advice from their assigned faculty mentor. The COB/AAO assigns students to an appropriate faculty member for career advising.

## The Peter M. and Paula Green Johnson Career Center

vacant, Director

The College of Business Peter M. and Paula Green Johnson Career Center offers business students comprehensive career planning services.

Services include job search strategies, resume and interview preparation, networking, internship resources, and self-marketing skills development. Individual appointments may be scheduled by e-mail ([jcc@uwyo.edu](mailto:jcc@uwyo.edu)) or by phone, (307) 766-4807.

## Student Responsibilities

College of Business students are responsible for knowing and meeting requirements for graduation. In addition to degree requirements, all College of Business students must complete the advanced business standing requirements prior to enrollment in most upper-division (3000/4000-level) College of Business courses (see Advanced Business Standing Prerequisites section).

All students must have already completed any prerequisites listed (in addition to ABS for COB students), including having the appropriate class standing. Class standing means for a 2000-level course, the student has **earned** a minimum of 30 hours; 3000-4000-level, the student has **earned** a minimum of 60 hours. Students not meeting the prerequisites are identified and administratively dropped from those courses each semester.

## Requirements for the Bachelor of Science Degree

Candidates for the Bachelor of Science degree in the College of Business must meet university, college, and departmental requirements. Degree candidates for the B.S. degree in the College of Business also must have a minimum 2.50 cumulative grade point average and a 2.50 grade point average in College of Business courses at the time of graduation. In addition, economics majors also must hold a minimum 2.50 grade point average for all economics courses.

College of Business degree candidates must earn a minimum of 120 semester hours depending on major including:

**I. University Studies Requirements:**

All first year students who enter the University of Wyoming (UW) and students who enter a Wyoming Community College (CC) are required to meet the USP 2015 requirements for graduation. Wyoming CC students transferring to UW with an Associate of Arts or Associate of Science degree will have course work evaluated per the General Education Articulation Agreement between the University of Wyoming and Wyoming Community Colleges. Non-resident transfer students and Wyoming CC transfer students without an associate's degree will have course work evaluated on a course-by-course basis, based on all approved USP courses.

Academic advisers will help students select the appropriate courses to satisfy university studies requirements. Some College of Business requirements also meet university studies requirements.

<b>A. Basic skills (USP 2015)</b>	<b>Hrs.</b>
1. First-year seminar (FYS) Choose from list of approved courses .....	3
2. Writing	
a. USP Communications 1 course (COM1) .....	3
b. USP Communications 2 course—Mid-level communications or 2000-4000-level communications intensive course—Choose from list of approved courses (COM2).....	3
c. USP Communications 3 course—Upper-level communications or 3000-4000-level communications intensive course—see department for required courses (COM3) .....	3
3. Physical and Natural World.....	6
4. Human Culture—Two courses required—choose from list of approved courses (H) ..	6
5. U.S. and Wyoming Constitutions (V) .....	3

The number of hours of elective credit varies by department, and there is a limit on the number of military science courses that may be taken.

Students may not take courses for S/U (satisfactory/unsatisfactory) credit to satisfy university studies or college requirements, course requirements in the major, or courses outside the college required by the major department curriculum.

**Advanced Business Standing Prerequisites**

College of Business students must satisfy the following advanced business prerequisites prior to enrolling in most upper-division (3000/4000-level) College of Business courses:

1. Achieve junior standing by completing a minimum of 60 semester hours;
2. Complete 10 specific courses with a grade of C or better in each. These ten courses are: ECON 1010 and 1020, USP Communications 1 and 2 courses, ACCT 1010 and 1020, IMGT 2400, MATH 2200 and 2205 or MATH 2350 and 2355 and STAT 2050 or 2070.
3. Achieve a cumulative grade point average of at least 2.50.

**Common Course Work**

College of Business majors take a common set of courses that expose them to the basic concepts, processes and technical skills necessary to complete a well-rounded high quality business education. The common course work includes FIN 3250, MGT 1040, DSCI 3210, IMGT 2400, MGT 3210, 4800, MKT 3210, ACCT/ECON 1010, and ACCT/ECON 1020.

**Requirements for Non-College of Business Majors**

Students in non-College of Business majors who wish to enroll in College of Business upper-division courses need not meet the advanced business standing prerequisites. However, they are required to meet individual course prerequisites listed in the bulletin, including class standing. This means for 2000-level courses, they must have earned a minimum of 30 hours. For 3000-4000-level courses, they must have earned a minimum of 60 hours.

In accordance with AACSB standards, students in non-College of Business majors may take no more than 25 percent of courses (30 hours) required for their degree programs in the College of Business.

**Acceptance of Transfer Credit**

The College of Business complies with UW policies regarding transfer credit discussed in the front section of this bulletin. The college has special course transfer arrangements with Wyoming community colleges that allow some courses taken at community colleges at the lower-division (freshman-sophomore) level to transfer for upper-division (junior) credit.

Wyoming community college transfer students should contact the College of Business Academic Advising Office for details.

Students transferring to the College of Business from community colleges outside Wyoming and non-AACSB accredited colleges and universities may validate some courses for which upper-division business credit is sought. Students transferring from other AACSB accredited colleges and universities will have their courses reviewed for transfer on a case-by-case basis.

The College of Business does not accept transfer credits for COB courses with equivalents at UW when the grade earned was less than a C.

Students must have a minimum 2.50 grade point average to transfer into the College of Business from across campus.

**Business Administration Online Program**

The College of Business offers students a business administration degree accredited by *AACSB International* and delivered through Online UW. The program is designed to help students maximize their flexibility in the business world as it focuses on all functional areas in business.

After completing UW approved general education courses and business administration prerequisites at a community college or university, students are eligible to apply for admission into the online undergraduate business administration degree program.

Students will be required to apply to UW, have a 2.50 cumulative grade point average, and advanced business standing before being considered for admission into the business online administration program. The application for admission into the business online administration degree program must be completed on or before March 1 for summer or fall enrollment and October 15 for spring enrollment. Students must also attain a 2.50 GPA for graduation for both College of Business and UW courses, and must take the ETS exam to graduate.

To ensure you the availability of required courses in this program, enrollment into courses is managed and approved by the College of Business Academic Advising office.

**College of Business Minors**

Minors are available to on-campus students through the College of Business in the areas of accounting, banking and financial services, business (not available to College of Business



majors), decision science, economics, entrepreneurship, finance, information management, international business, management, marketing, marketing communication, real estate finance, and sustainable business practices. Minors requirements may often be met by simply focusing the elective credits available in a student's major.

The minors program consists of course requirements ranging from 18 to 24 hours of study. A minimum grade of C must be earned in each course. Certification of a successful minor program completion occurs as part of the DegreeWorks progress report, and the registrar notes the completion of the minor on student transcripts. Minors must be approved by the COB/AAO prior to graduating semester.

To earn a College of Business minor, students must first apply for admission to the minors program in the College of Business Academic Advising Office in 175 Business Building no later than the first semester of their senior year. To be admitted to College of Business minors program, students must have a minimum 2.50 cumulative UW GPA. Students must maintain a cumulative 2.50 GPA in the required College of Business courses for the minor to be awarded. Non-College of Business students must meet the individual course prerequisites listed in this Catalog, although they need not meet the advanced business standing requirements.

#### College of Business Student Intern Program

Local, regional, national and international internship opportunities are available to College of Business majors through the Student Intern Program located in the Peter M. and Paula Green Johnson Career Center (181 Business Building).

Internships match the needs of students for early experiences in business with the needs of participating organizations for managerial talent.

#### Cooperative Undergraduate Programs *The Concentration in Environment and Natural Resources*

College of Business majors may earn a cross major in Environment and Natural Resources (ENR) in cooperation with the UW School of Environment and Natural Resources. The appropriate use of natural resources and awareness of environmental consequences of decisions have become major issues for business. Exposure to ideas, skills and sensibilities in these areas is critical to future business people. Students majoring

in economics may elect an environment and natural resources concentration in which an economics approach to problem solving is stressed. For more information call the ENR office at (307) 766-5089.

#### Graduate Study

The College of Business is comprised of three academic departments: accounting, economics and finance, and management and marketing. The faculty of these departments cooperate in the presentation of graduate work leading to the following degrees:

- Master of Business Administration
- Master of Science in Accounting
- Master of Science in Economics
- Master of Science in Financial Economics
- Master of Science in Finance
- Doctor of Philosophy in Economics
- Doctor of Philosophy in Marketing with an emphasis on sustainability

The College of Business faculty is firmly committed to the excellence of its graduate programs. The graduate programs in the College of Business are accredited by AACSB-International.

The three academic departments coordinate course offerings to support all of the graduate degree programs; the M.B.A. program in particular is a college-wide effort.

#### Minor in Environment and Natural Resources

College of Business graduate students may earn an interdisciplinary minor in environment and natural resources (ENR) in cooperation with the UW School of Environment and Natural Resources. The appropriate use of natural resources and awareness of environmental consequences of decisions have become major issues for all areas of business and economics. The School of Environment and Natural Resources is designed to move beyond the strictly disciplinary design and management of their long-term solutions. The school seeks to attract outstanding graduate students from a variety of disciplines, who are eager to pursue careers that engage other professionals, policymakers, and the public in finding innovative ways to resolve complex environmental and natural resource issues. To pursue a minor in ENR, students must first be admitted to another master's or doctoral degree program offered at the University of Wyoming. For more information call the ENR office at (307) 766-5080.

## Business (BUSN)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◆Q]).

1101. First-Year Seminar. 3. [(none)◆FYS]

### Department of Accounting

252 East Business Building, 766-3136

FAX: (307) 766-4028

Web site: [www.uwyo.edu/accounting](http://www.uwyo.edu/accounting)

Department Chair: Penne Ainsworth

#### Professors:

**PENNE AINSWORTH**, B.S. Kansas State University 1983; M.Acc. 1984; Ph.D. University of Nebraska 1988; Professor of Accounting 2001, 1997.

**ERIC N. JOHNSON**, B.A. Whittier College 1978; M.B.A. Arizona State University 1982; Ph.D. 1989; Clara R. Toppan Professor of Accounting 2011; Professor of Accounting 2013, 2011.

#### Associate Professors:

**LINDA A. KIDWELL**, B.A. Smith College 1984; Ph.D. Louisiana State University and Agricultural and Mechanical College 1993; Associate Professor of Accounting 2008, 2005.

#### Assistant Professors:

**ROBSON GLASSCOCK**, B.B.A. Texas State University 2003; M.S. University of Denver 2008; Ph.D. Virginia Commonwealth University 2014; Assistant Professor of Accounting 2014.

**JOY L. EMBREE**, B.S. Oral Roberts University 1982; M.B.A. University of Akron 2004; Ph.D. University of Nebraska-Lincoln 2012; Assistant Professor of Accounting 2013.

**J. ERIC SIMS**, B.A. University of West Florida 1990; M.Acc. University of Central Arkansas 2007; Ph.D. University of Mississippi 2012; Assistant Professor of Accounting 2012.

**XIN (SHAWN) XU**, B.S. Tsinghua University, Beijing, China; M.S. University of Michigan 2001; Ph.D. Michigan State University 2009; Assistant Professor of Accounting 2014.

#### Academic Professionals:

**JANICE A. BENSON**, B.S. Kansas State University 1991; M.B.A. 1993; Senior Lecturer of Accounting 2010, 1999.

**MICHAEL J. DOHERTY**, B.S. University of Wyoming 1994; M.B.A. 2000; Senior Lecturer of Information Management 2012, 2006, 2000.

**AMBER MERCIL**, B.S. University of Wyoming 2004; M.S. University of Oregon 2006; Graduate Coordinator in Accounting; Assistant Lecturer of Accounting 2014.

**JACQUELYN A. WALKER**, B.S. Regis University 1983; M.S. University of Wyoming 2004; Ed.D. 2013; Assistant Lecturer of Information Management 2013.

**JODY YELTON**, B.S. University of Wyoming 2001; M.S. 2002; Assistant Lecturer of Accounting 2014.

#### Emeriti:

Richard G. Elmendorf

George R. McGrail

Suzanne S. Roe

Kenton B. Walker

Stuart K. Webster

#### Please Note:

Students who anticipate preparing themselves for the CPA examination following completion of their degree should be aware of the Wyoming statute governing eligibility to sit for the exam. Please see the state board's web site for information: [cpaboard.state.wy.us](http://cpaboard.state.wy.us). The current combined curricula (B.S. and M.S.) enable students to satisfy the educational requirements to sit for the CPA exam in Wyoming and other jurisdictions.

The basic objectives of the accounting program are twofold: to provide students who do not intend to major in accounting with the basis for understanding the role accounting plays in business today; and to provide those students who desire to major in accounting with the educational background necessary for lifelong learning and a rewarding career in the accounting profession. The curriculum offered by the department attempts to blend the conceptual with the practical. Exposure to the underlying conceptual framework of accounting provides a basis for dealing with emerging accounting issues, while examination of technical pronouncements enables students to gain insight into practical issues encountered in an accounting environment.

Accounting majors may enter the professional world of accounting from a variety of directions. Choices available in the form of elective courses enable students to chart a course that leads them toward public accounting, private accounting, governmental or not-for-profit accounting, as well as other specialties that rely on a strong accounting background. Those students seeking professional certification, such as the CMA or CIA, are able to satisfy requirements to sit for these professional examinations by completing the undergraduate accounting degree.

All accounting majors must comply with requirements of the advanced business prerequisites for enrollment in upper-division courses and must complete the common body of knowledge courses as listed previously. All accounting courses for the major require a minimum grade of C.

In addition to university, college, and departmental requirements cited previously, requirements for accounting majors include:

**Accounting courses.....27**  
ACCT 3240, 3230, 3430, 3070, 3830, 3610, 4060, 4050, 4600

**Accounting electives (select one).....3**  
ACCT 4830, 4020, 4540

**Total 30**

Complete curriculum sheets, as well as anticipated changes in course numbering, are available from the College of Business Academic Advising Office in Room 175 West of the College of Business building.

## Graduate Study

Accounting is an integral part of the College of Business degree programs. The department offers courses in support of college graduate degree programs, as well as a master of science in accounting (MS in Accounting) degree. The MS in Accounting degree was developed in response to emerging needs of the accounting profession. Those students who wish to become professional accountants, whether that be in a corporate setting, a not-for-profit setting, or public accounting, will find the MS in Accounting degree to be one that enables them to develop both the personal and professional skills needed to enjoy a productive career.

The MS in Accounting program satisfies the state requirements for individuals to take the Certified Public Accountant (CPA) exam and it further develops students' professional skills. The MS in Accounting program focuses on the two main areas of development: 1) advanced accounting and business education, and 2) professional skills development—including written, oral, interpersonal communication, computer applications, critical thinking, and adaptability.

The MS in Accounting degree is designed for students who have completed an undergraduate degree in accounting in the United States. However, it is possible to be admitted to the program once deficiency courses are successfully completed. Those holding a bachelor's degree from within the U.S., but not in

accounting, and international applicants can still apply for admission once the deficiency courses are successfully completed.

## Program Specific Admission Requirements

To be admitted to the MS in Accounting program, a student must have a bachelor's degree in accounting or meet requirements listed previously and must have completed courses in the following core areas: accounting (U.S. GAAP, U.S. tax code, U.S. auditing, managerial accounting), finance, management, and marketing. Coverage in these courses must include: ethical and global issues; political, social, legal, and environmental issues; technological issues; and the impact of diversity on organizations.

Completed M.S. in Accounting application (submit online at [www.uwyo.edu/accounting](http://www.uwyo.edu/accounting)).

Completed University of Wyoming Admissions Graduate Application and required application fee (complete online at: [www.uwyo.edu/admissions/graduate/application.html](http://www.uwyo.edu/admissions/graduate/application.html)).

An undergraduate GPA of 3.0/4.0.

Official transcripts from **all** previous post-secondary institutions attended (not necessary if UW is the most recent institution attended). Official transcripts should be sent directly from the issuing institution to the MS in Accounting Program.

GMAT total score of 550 or better, or combined GRE score of 300 or better. Official test scores must be sent directly to the MS in Accounting Program by the sponsoring test provider (UW school code: 4855).

Three (3) work- or school-related letters of recommendation sent by the reference directly to the MS in Accounting Program.

International applicants (from non-English speaking countries) must complete the TOEFL (Test of English as a Foreign Language). Applicants must score 540 on the Paper-based test (TOEFL PBT) or 76 on the Internet-based test (TOEFL iBT). Official test scores must be sent directly from the Educational Testing Service. TOEFL scores are valid for two years after the test date.

International applicants must also have sufficient financial resources as established by the University of Wyoming.

Summer/fall admittance requires all completed application materials to be submitted on or before March 15 if applying for a graduate assistantship, or May 1 if not applying for an assistantship and/or a scholarship. Spring

admittance requires all completed application materials to be submitted on or before October 15.

GMAT or GRE scores, TOEFL scores, transcripts, and letters of recommendation should be sent to:

M.S. in Accounting Program  
College of Business  
Dept. 3275  
1000 East University Avenue  
Laramie, WY 82071 USA

## Program Specific Degree Requirements

### *Master of Science in Accounting*

The objectives of the master of science in accounting are:

- To provide students with an advanced understanding of the field of accounting,
- To provide students with specific advanced knowledge of the sub-topics within accounting,
- To provide students with professional skills that will enable them to enjoy productive and rewarding careers in accounting and other accounting-related areas.

The program consists of a minimum of 30 semester hours of graduate coursework. Students must complete coursework in accounting and elective business and/or non-business areas. Eighty percent of the student's total coursework must consist of 5000-level courses; the remaining 20 percent may be 4000-level non-accounting courses (approximately six hours). Non-accounting courses should be selected in consultation with the student's graduate adviser. Non-accounting courses at the 4000-level may be taken during the senior year of undergraduate study and applied to the master's program, but they must be reserved for graduate credit and approved by the graduate program director, prior to the first day of such classes.

Students must take at least these 5 required accounting courses (minimum 15 credit hours):

- ACCT 5030. Advanced Financial Accounting
- ACCT 5040. Seminar in Managerial Accounting
- ACCT 5060. Auditing II
- ACCT 5070. Tax II
- ACCT 5065. Fraud Examination

Students may take up to 9 additional credit hours of accounting coursework from the following:

- ACCT 5075. Individual and Estate Tax Planning
- ACCT 5503. Fundamentals of Accounting in the Energy Industry
- ACCT 5650. Seminar in Accounting Information Systems
- ACCT 5800. Seminar in Contemporary Topics in Acct (as needed)
- ACCT 5830. Survey of International Accounting
- ACCT 5850. Advanced Problems in Accounting (as needed)

The remaining hours will come from 4000- or 5000-level courses offered in the College of Business or in other colleges at the University of Wyoming.

The student must complete the required coursework (both graduate and prerequisite) with a minimum GPA of 3.0 (on a 4.0 scale).

A student may have only one C in his or her program of study.

Any student falling below a cumulative GPA of 3.0 is automatically placed on probation for the following semester and must raise their GPA to 3.0 to avoid dismissal.

Students earning a grade lower than a C or a second C will be dismissed.

## Accounting (ACCT)

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).**

**1010 [2010]. Principles of Accounting I. 3.** Provides a basic understanding of the financial accounting information role in business and society. Focuses on the recording and reporting of business operating, financing, and investing events. Provides insights on business and enables students to become familiar with shareholder/external party reporting conventions. (Offered fall, spring and summer)

**1020. [2020]. Principles of Accounting II. 3.** Provides a basic understanding of the managerial accounting information role in business decision-making. Provides insights on how businesses operate and enables students to become familiar with the conventions used by business to make decisions and how accounting information is reported to managers. *Prerequisite:* ACCT 1010. (Offered fall and spring)

**2110 [3110]. Managerial Accounting. 3.** An introductory course concerned with the use of accounting information by nonaccountants for planning, product costing, performance assessment and non-routine decision making. Not available for credit for accounting majors.

*Prerequisites:* ACCT 1010 and 1020 (or equivalents); non-accounting majors. (Offered fall, spring and summer)

**3070. Tax I. 3.** Introduction to a broad range of tax concepts applicable to corporations, partnerships, and individuals. Emphasis is on the role of taxation in the business decision-making process. Students are exposed to basic tax research and planning techniques. *Prerequisites:* ACCT 3240 and ACCT 3230 with grades of C better in each; advanced business standing.

**3100 [4100, 2000, 3000]. Financial Statement Analysis. 3.** Advanced study of financial statements and how to analyze those statements from both an internal and external perspective. *Prerequisites:* FIN 3250 (or equivalent) with a grade of C or better; advanced business standing; non-accounting majors.

**3230 [2230]. Intermediate Accounting I. 3.** First of three courses studying financial reporting. Topics include recording and reporting events in the expenditure and revenue cycles. *Prerequisites:* ACCT 1020 and MATH 1400 with grades of C or better in each; sophomore standing.

**3240 [2240]. Cost Accounting I. 3.** Organizational uses of information to plan, make decisions, and evaluate performance. Specific topics include job order and process costing, cost estimation and CVP analysis, budgeting and variance analysis. *Prerequisites:* ACCT 1020 and MATH 1400 with grades of C or better in each; sophomore standing.

**3430. Intermediate Accounting II. 3.** Second of three courses studying financial reporting. Topics include recording and reporting events in the investing and financing cycles. *Prerequisites:* ACCT 3230 with grade of C or better; advanced business standing.

**3610 [2040, 3010]. Accounting Information Systems I. 3.** Provides an understanding of accounting information systems and internal controls. Emphasis on the use of current accounting technology, accounting software and internal control systems. *Prerequisites:* ACCT 3240 and ACCT 3430 (or equivalents) with grades of C or better in each; advanced business standing.

**3700. Accounting Internship. 1-6 (Max. 6).** Allows students to obtain college credit for experience in an approved accounting work situation. The general objectives are to increase students' understanding of business, specific types of accounting tasks and types of accounting employment through work experience. For credit, the job description and credit hours must be approved in advance and job performance must be reported and evaluated. Does not apply toward required 30 hours of

accounting. *Prerequisites:* advanced business standing; junior standing and consent of instructor. (Offered based on sufficient demand and resources)

**3830. Intermediate Accounting III. 3.** Third of three courses studying financial reporting. Topics include full disclosure and special issues in expense and liability recognition. *Prerequisites:* ACCT 3430 with grade of C or better; advanced business standing.

**4010. Accounting Information Systems II. 3.** Advanced topics in accounting information systems. Focuses on a database approach to accounting system design and also explores special topics in accounting system technology. May be partially taught in a lab setting. *Prerequisites:* ACCT 3610 and 3830 (or equivalents) with grades of C or better in each; advanced business standing. (Offered based on sufficient demand and resources.)

**4020. Information Security. 3.** Investigation, prevention and control surrounding the protection of business related data, information and technology resources. Includes the use of industry supported frameworks aimed at the evaluation of threats; design of information security architectures; implementation processes; reporting and monitoring, along with ongoing maintenance, intrusion detection, security log analysis, and contingency planning. Cross listed with IMGT 4020. *Prerequisite:* IMGT 3400 or ACCT 3610.

**4050. Governmental and Nonprofit Accounting. 3.** Designed to introduce students to accounting for state and local governmental entities and nonprofit organizations. Students learn about the entity structure, accounting practice, accounting systems and reporting practices for these organizations. *Prerequisites:* ACCT 3830 and 3610 (or equivalents) with a grade of C or better in each; advanced business standing.

**4060. Auditing I. 3.** A study of the scope, activities, and responsibilities of professional auditors. Topics include assurance services by public accountants, operational and compliance auditing by internal and governmental auditors, fraud auditing, and the role of internal control in all audits. *Prerequisites:* ACCT 3070, 3610, and 3830 (or equivalents) with grades of C or better in each; advanced business standing.

**4540. Cost Accounting II. 3.** Advanced topics in cost accounting concerning the organizational uses of information to plan, make decisions, and evaluate performance. *Prerequisites:* ACCT 3240 with a grade of C or better and sophomore standing.

**4600. Professionalism and Ethics. 3. [WC◀COM3]** Examines professional ethics for accountants from both a philosophical and business perspective. Moral development, ethical reasoning, and ethical decision making provides a framework for examining the importance of ethics in the accounting profession. Professional guidance on ethics in accounting is also examined, including the AICPA Code of Professional Conduct, the Sarbanes-Oxley Act, and the codes for other professional accounting organizations. *Prerequisites:* ACCT 3070, 3610, and 3830 (or equivalents) with grades of C or better in each; ACCT 4060 with a C or better or concurrent enrollment; advanced business standing.

**4830. Survey of International Accounting. 3.** Introduction to international accounting practices and current developments. Includes an exploration of cultural, historical, and political reasons for international accounting practice diversity; an introduction to International Accounting Standards; tracking current developments in the process of convergence; and an introduction to international auditing standards and ethical expectations of accountants world-wide. Dual listed with ACCT 5830. *Prerequisites:* ACCT 3430 (or equivalent) with a grade of C or better; advanced business standing.

**4900. Problems in Accounting. 1-4 (Max. 4).** An arrangement whereby students may investigate a particular problem area in accounting on an individual basis. *Prerequisites:* 6 hours in accounting; advanced business standing; junior standing; and written consent of instructor. (Offered based on sufficient demand and resources)

**NOTE: ACCT 4010, 4020, 4050, 4060, 4100, 4600, 4900, and 5000 are not applicable for M.S. accounting students' programs of study.**

**5030. Advanced Financial Accounting. 3.** Advanced topics in financial reporting for students planning careers as professional accountants. Topics may include: business combinations, consolidated financial reporting, segment and interim reporting, SEC reporting, multinational accounting and reporting, and other emerging topics. *Prerequisite:* ACCT 3830 (or equivalent) with a grade of C or better; graduate standing.

**5040. Seminar in Managerial Accounting. 3.** Organizational development of financial and nonfinancial budgets, interaction between performance measurement systems and human behavior, and advanced topics in uses of information for decision making. *Prerequisite:* ACCT 3240 (or equivalent) with a grade of C or better; graduate standing.

**5060. Auditing II. 3.** An in-depth study of the financial statement audit and the professional responsibilities of public accountants. Covers professional standards, audit services, planning, internal control, audit testing including sampling, audit reports, the code of professional conduct, and the legal liability of auditors. *Prerequisite:* ACCT 4060 (or equivalent) with a grade of C or better; graduate standing.

**5065. Fraud Examination. 3.** Gives consideration to the methodology for resolving allegations of fraud from inception to disposition. Topics covered include: gathering evidence, taking statements, writing reports, and assisting in the detection and deterrence of fraud. Coverage may also include emerging topics germane to fraud and ethics. *Prerequisite:* ACCT 4060 (or equivalent) with a grade of C or better; graduate standing.

**5070. Tax II. 3.** Choice of entity and special tax subjects. Emphasis will be placed on the importance of ethical considerations, competent tax research, and thoughtful tax planning. *Prerequisite:* ACCT 3070 (or equivalent) with a grade of C or better; graduate standing.

**5075. Individual and Estate Tax Planning. 3.** Focuses on tax-planning strategies and techniques. Investigates a wide variety of topics, ranging from individual issues to estate, gift, trust, and small business tax planning. *Prerequisite:* ACCT 3070 (or equivalent) with a grade of C or better; graduate standing.

**5503. Fundamentals of Accounting in the Energy Industry. 3.** Introduces students to basic financial accounting and reporting issues related to energy producing activities. Specifically, the course will investigate current accounting practices of energy producing companies related to exploration, acquisition, development, and delivery of energy products. The course will also cover financial requirements of the Financial Accounting Standards Board (FASB), the International Accounting Standards Board (IASB), and the Securities and Exchange Commission (SEC). Cross listed with MBAM 5503. *Prerequisite:* Permission of MBA Program Director, or student's graduate program coordinator in consultation with MBA Program Director.

**5650. Seminar in Accounting Information Systems. 3.** An advanced study of the implications of information systems for accountants with emphasis upon accounting application as well as the body of knowledge required for the accountant who is expected to provide relevant, significant data for an increasingly wide range of purposes. *Prerequisite:* ACCT 3610 (or equivalent) with a grade of C or better; graduate standing.

**5800. Seminar in Contemporary Accounting Topics. 1-3 (Max. 6).** An in-depth investigation of selected issues in accounting. Course is offered on an infrequent basis. *Prerequisite:* consent of instructor; graduate standing.

**5830. Survey of International Accounting. 3.** Introduction to international accounting practices and current developments. Includes an exploration of cultural, historical, and political reasons for international accounting practice diversity; an introduction to International Accounting Standards; tracking current developments in the process of convergence; and an introduction to international auditing standards and ethical expectations of accountants world-wide. Dual listed with ACCT 4830. *Prerequisites:* ACCT 3430 (or equivalent) with a grade of C or better; graduate standing and admission to the Master of Science in Accounting Program.

**5850. Advanced Problems in Accounting. 1-8 (Max. 8).** An arrangement whereby students may investigate a more advanced problem area in accounting on an individual basis. *Prerequisite:* consent of instructor; graduate standing.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: Credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrollment in a graduate degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Information Management (IMGT)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB↔Q]).

**2400. Introduction to Information Management. 3.** Concerned with the role of information systems in managing organizations to make them more competitive and efficient. Specific topics include organizational and technical foundation of information systems and building and managing systems. *Prerequisite:* ACCT 1020 or concurrent enrollment.

**3400. Database Management Systems. 3.** Concerned with the fundamentals of modern database information systems. Specific topics include database systems design, entity-relationship models, relational, hierarchical, and network database models, query languages, and data warehousing. *Prerequisite:* IMGT 2400.

**4020. Information Security. 3.** Investigation, prevention and control surrounding the protection of business related data, information and technology resources. Includes the use of industry supported frameworks aimed at the evaluation of threats; design of information security architectures; implementation processes; reporting and monitoring, along with ongoing maintenance, intrusion detection, security log analysis, and contingency planning. Cross listed with ACCT 4020. *Prerequisite:* IMGT 3400 or ACCT 3610.

**4455 [3450]. Systems Analysis and Design. 3.** Concerned with the analysis, management, and conceptual design of information systems. Specific topics include systems planning, requirements analysis, business process modeling and redesign, flexibility analysis, alternative analysis, and architectural selection and design focused on supporting an organization's business requirements through various system design methodologies. Cross listed with MGT 4455. *Prerequisite:* IMGT 2400 and Advanced Business Standing.

**4990. Contemporary Topics in Information Management. 1-3 (Max. 6).** Concerned with contemporary topics in information management and serves as elective credits for a minor in information management. A variety of subjects may be considered for this course including corporate information systems, object oriented technology, management of information technology, decision support systems, and data communication and network. *Prerequisites:* IMGT 3400 or concurrent enrollment. (Offered based on sufficient demand and resources)

## Department of Economics and Finance

225E Business Building, 766-2175

FAX: (307) 766-5090

Web site: [business.uwyo.edu/EconFin](http://business.uwyo.edu/EconFin)

Department Chairman: Frederic P. Sterbenz

**John S. Bugas Professor of Economics: EDWARD B. BARBIER**, B.A. Yale College, Yale University 1979; M.Sc. London School of Economics 1980; Ph.D. Birkbeck College, University of London 1986; Professor of Economics 2000.

**H.A. (Dave) True, Jr. Chair in Petroleum and Natural Gas Economics: CHARLES F. MASON**, A.B. University of California 1977; Ph.D. 1983; Professor of Economics 1994, 1982.

**John A. Guthrie, Sr. Distinguished Professor of Banking and Financial Services: SHERRILL SHAFFER**, B.A. Rice University 1974; Ph.D. Stanford University 1981; Professor of Finance 1997.

**Stroock Professor of Natural Resource and Environmental Economics: JASON F. SHOGREN**, B.A. University of Minnesota-Duluth 1980; Ph.D. University of Wyoming 1986; Professor of Economics 1995.

**Professors: TIMOTHY J. CONSIDINE**, B.A. Loyola University 1975; M.S. Purdue University 1977; Ph.D. Cornell University 1981; Professor of Economics 2008.

**OWEN R. PHILLIPS**, B.A. Stanford University 1974; Ph.D. 1980; Professor of Economics 1995, 1985.

**FREDERIC P. STERBENZ**, B.S. Massachusetts Institute of Technology 1975; M.A. University of Pennsylvania 1977; Ph.D. 1981; Professor of Economics and Finance 2003, 1987, 1981.

**Associate Professors: DAVID M. AADLAND**, B.A. Augustana College 1991; M.S. University of Oregon 1996; Ph.D. 1997; Associate Professor of Economics 2005, 2003.

**SUMAN BANERJEE**, B.S. University of Calcutta 1989; M.A. Delhi School of Economics 1996; Ph.D. University of Iowa 1999; Associate Professor of Economics 2014.

**DAVID C. FINNOFF**, B.S. University of Wyoming 1994; Ph.D. 2001; Associate Professor of Economics 2010, 2004.

**ROBERT GODBY**, B.S. Trent University 1990; M.A. University of Guelph 1992; Ph.D. McMaster University 1997; Associate Professor of Economics 2003, 1997.

**THORSTEN M. JANUS**, B.A. University of Copenhagen 2000; M.A. University of California at Santa Cruz 2003; Ph.D. 2006; Associate Professor of Economics 2012.

**KLAAS T. VAN 'T VELD**, B.Sc. University of London 1992; M.S. University of California-Berkeley 1993; Ph.D. 1997; Associate Professor of Economics 2010, 2004.

**Assistant Professors:**

**NICOLE CHOI**, B.A. Chungbuk National University 2002; M.B.A. Washington State University 2004; Ph.D. 2009; Assistant Professor of Finance 2009, 2012.

**BENJAMIN T. GILBERT**, B.A. Whitman College 1999; Ph.D. University of California, San Diego 2011; Assistant Professor of Economics 2011.

**SRIDHAR GOGINENI**, Management Studies Birla Institute of Technology and Science 2002; M.A. Ohio University 2005; Ph.D. University of Oklahoma 2011; Assistant Professor of Finance 2011.

**ALEXANDRE SKIBA**, Specialist Diploma Rivne State Technical University 1999; M.S. Purdue University 2001; Ph.D. 2003; Assistant Professor of Economics 2008, 2012.

**FELIX NASCHOLD**, B.S. University of London 1994; M.S. 1995; Ph.D. Cornell University 2008; Assistant Professor of Economics 2014.

**HILLA SKIBA**, B.A. University of Kansas 2002; M.A. 2004; Ph.D. 2008; Assistant Professor of Finance 2008, 2012.

**LINDA THUNSTROM**, M.S. Umea University, Sweden 1999; Ph.D. Umea University Sweden 2008; Assistant Professor of Economics 2013.

**Professors Emeriti:**

John W. Birch, Curtis A. Cramer, Thomas D. Crocker, William E. Morgan, John T. Tschirhart

**Business Economics Major**

The science of efficient allocation, economics has much to offer students in the way of general and specialized preparation for positions in business, as well as government and the academic profession.

In addition to university and college requirements cited previously, requirements for business economics majors include:

	<b>Hrs.</b>
1. ECON 3010,3020, 4240 or 4250 .....	9
2. Economics electives .....	15
At least 12 hours must be 4000-level courses	
3. Common business course work.....	18
MGT 1040, FIN 3250, MGT 3210, DSCI 3210, MKT 3210 and MGT 4800	
4. IMGT 2400 .....	3
5. Electives .....	26

A complete curriculum sheet is available from the College of Business Academic Advising Office.

All economics majors must comply with requirements of the advanced business prerequisites for enrollment in upper-division courses.

Economics majors must hold a 2.50 cumulative grade point average in all economics courses at graduation, as well as a minimum 2.50 cumulative UW grade point average and a minimum 2.50 grade point average in all College of Business courses.

With approval of the department chair, students may substitute work in certain areas of accounting, agricultural economics, business administration, history, political science, finance, mathematics, statistics or law for 6 hours of 4000-level economics courses.

Students who intend to continue on to graduate work are urged to give special attention to courses in economics theory, statistics and mathematics. Those planning a career in econometrics or mathematical economics should consult the department head as to mathematics and statistics requirements in these fields of study.

A complete curriculum sheet is available from the College of Business Academic Advising Office.

**Economics Undergraduate Major**

The economics major in the College of Business must complete 30 semester hours in economics courses.

Basic requirements for the B.S. degree include: ECON 1010, 1020, 3010, 3020, 4240 or 4250, and 15 hours of upper level economics electives; STAT 2010 or 2070 and one year of calculus sequence, MATH 2200 and 2205, or 2350 and 2355. Upon securing the approval of the department head, a student may substitute work in certain areas of accounting, agricultural economics, business administration, history, political science, finance, mathematics, statistics or law for 6 hours of the 4000-level economics electives.

This program allows considerable flexibility for the student to specialize in interdisciplinary study. For example, the student can be advised on selecting upper level division courses for pre-law study, political economy, environmental and natural resources, women's studies, and international studies.

Students who intend to continue in graduate work are urged to give special attention to courses in economic theory, statistics and mathematics. Those planning a career in mathematical economics or econometrics should consult the department head regarding the mathematics and statistics requirements in these fields of study.

A complete curriculum sheet is available from the College of Business Academic Advising Office.

**Graduate Work**

The College of Business Department of Economics and Finance offers programs leading to the Master of Science degree, and to the Ph.D. degree.

**Graduate Study**

The Department of Economics and Finance offers programs leading to a master of science degree in economics, a master of science degree in finance, a dual master of science, and the doctor of philosophy degree in economics.

**Program Specific Admission**

**Requirements  
Economics Program**

Admission to the economics program is granted to students who show high promise of success. Candidates of high promise generally have a cumulative grade point average of 3.0 or better (A=4) and score at or about the 65th percentile or better on both the verbal and quantitative sections of the GRE. It should be noted that attainment of the minimal GPA and GRE does not necessarily constitute automatic admission.

The TOEFL is required for international students. See the department web site for minimum scores required.

In addition to the minimum requirements, the Department of Economics and Finance requires that students have completed courses in intermediate micro and macro theory (ECON 3010, 3020 or equivalent) and 6 hours of introductory calculus (MATH 2200, 2205 or equivalent). A course in linear algebra (MATH 2050) is recommended but not required. No

graduate credit is given for making up these deficiencies. In addition, an entering student may be required to take an examination to aid in planning his or her course of study.

### **Finance Program**

All candidates for the master of science in finance must complete or have previously completed, for a letter grade (no S/U grades), courses which satisfy the master of science in finance prerequisite course requirements. Students admitted to the M.S. finance program may take graduate courses in conjunction with their prerequisite courses once the prerequisites for those graduate courses have been met. A minimum 3.0 GPA (on a 4.0 scale) must be maintained in a student's finance prerequisite courses. The prerequisite courses include:

Accounting (6 hours): ACCT 1010 and 1020 Principles of Accounting I and II.

Economics (6 hours): ECON 3010 (2010, 4010) Intermediate Macroeconomics and ECON 3020 (2020, 4020) Intermediate Microeconomics, or ECON 4030 Managerial Economics.

Finance (3 hours): FIN 4520 Financial Markets.

Mathematics (4 hours): MATH 2350 Business Calculus I or MATH 2200 Calculus I.

Statistics (4 hours): STAT 2010 Statistical Concepts for Business and Management Science or STAT 2070 Introductory Statistics for the Social Sciences meets this requirement.

### **Program Specific Degree Requirements**

#### ***Master of Science in Economics***

A minimum of 18 hours in economics is required; at least 15 of these must be at the 5000 level. A basic core sequence of ECON 5010, 5020, and 5330 (math econ) must be taken and is credited toward the 15 hours of 5000-level courses required. Also, ECON 5340 is required.

The student must complete 26 hours of coursework and 4 hours of ECON 5960 Thesis Research for the Plan A option. The student must complete 30 hours of coursework and a shorter paper for the Plan B option.

Students may take 4000-level courses for graduate credit up to 12 hours.

A maximum of 6 semester hours of graduate coursework not used toward any other degree from another institution may be applied to the M.S. economics program subject to

regulations regarding transfer of credit listed in this bulletin and with the approval of the director of graduate studies.

At the beginning of the second semester, the student selects a major professor who directs the Plan A or Plan B research. A graduate committee, nominated by the major professor, the student, and the department chair, conducts an oral examination of the student on the paper or thesis and area he/she has studied in the program. A favorable report by the committee and approval by the Office of the Registrar complete the degree requirements.

The majority of students complete the M.S. degree within two years.

#### ***Master of Science in Finance***

A minimum of 21 hours in economics and finance is required. At least 21 hours must be at the 5000 level beyond the prerequisite course requirements. A basic core sequence of ECON 5010, FIN 5310, FIN 5320, FIN 5510 and FIN 5520 must be taken and is credited toward the 21 hours of 5000-level courses required. For the Master of Finance program only, Banking Management (FIN 4510) or Monetary Theory (ECON 4450) may be taken in lieu of Advanced Macroeconomics Analysis (ECON 5010). Also, ECON 5340 is required to complete the econometrics requirement. Remaining courses necessary to fulfill the requirement of 21 credit hours in finance and economics can be chosen in consultation with the Director of Graduate Studies.

The student must complete 26 hours of coursework and 4 hours of FIN 5960 Thesis Research for the Plan A option. The student must complete 30 hours of coursework and a shorter paper for the Plan B option.

Students may take 4000-level courses for graduate credit up to 12 hours.

A maximum of 6 semester hours of graduate coursework not used toward any other degree from another institution may be applied to the M.S. finance program subject to regulations regarding transfer of credit listed in this bulletin and with the approval of the director of graduate studies.

At the beginning of the second semester, the student selects a major professor who directs the Plan A or Plan B research. A graduate committee, nominated by the major professor, the student, and the department chair, conducts an oral examination of the student on the paper or thesis and area he/she has stud-

ied in the program. A favorable report by the committee and approval by the Office of the Registrar complete the degree requirements.

The majority of students complete the M.S. degree within two years.

#### ***Master of Science with a Dual Major in Economics and Finance***

This program is designed for students who wish to have a more quantitative background suitable for research, including study at the Ph.D. level or analysis as a financial market researcher. The program includes heavy emphasis in the areas of research and quantitative methodologies not usually emphasized at the master's level. The dual major will prepare a student for research or future graduate studies at the Ph.D. level in both finance and economics.

A program like this is offered at few other schools. We are able to offer this dual major at the University of Wyoming because our economics and finance programs reside in the same department. Several of our faculty members have expertise in financial economics, allowing students to study topics in finance from an economics perspective.

The master's with a dual major in economics and finance offers two different plans to the students, both of which require 39 credits to be completed. Plan A consists of 33 credits of coursework and a master's thesis, which completes the final 6 credits for the degree. Plan B consists of completing 36 credits of coursework and writing a Plan B paper, worth 3 credits.

Students will start their course of study with three courses in economics theory (ECON 5010, 5020, and 5330). The students will then complete courses in econometrics (ECON 5340 or 5350), investment management (FIN 5310), and finance theory (FIN 5520). Students will also take a two semester series of financial economics (ECON 5640 and ECON 5650) and a course in corporate governance (FIN 5320). The students are also offered a variety of electives to fulfill their 39 credits.

A maximum of 6 semester hours of graduate coursework not used toward any other degree from another institution may be applied to the M.S. degree subject to regulations regarding transfer of credit listed in this bulletin and with the approval of the director of graduate studies.

At the beginning of the second semester, the student selects a major professor who directs the Plan A or Plan B research. A graduate committee, nominated by the major professor, the student, and the department chair, conducts an oral examination of the student on the paper or thesis and area he/she has studied in the program. A favorable report by the committee and approval by the Office of the Registrar complete the degree requirements.

The majority of students complete the M.S. degree within two years.

### **Doctoral Program**

#### **Doctor of Philosophy in Economics**

To earn a doctor of philosophy degree in the field of economics, students are required to specialize in two of four complementary areas: resource and environmental economics, financial economics, international trade and development, and industrial organization. A third optional field in applied econometrics may be available. These four areas compose a unified field of study adapted to faculty research and to the unique opportunities for study of Wyoming's resource and environmental problems.

Student participation in faculty research programs to gain experience in applying concepts and techniques is considered an integral part of one's education. A minimum of 42 hours of coursework is required; at least 21 of these must be at the graduate (5000) level. A minimum of 28 hours must be in economics. Graduate credits may be transferred from other institutions subject to the approval of the Office of the Registrar. A minimum of 24 hours must be taken at the University of Wyoming and at least two semesters in residence are required.

The first-year program is designed to give the student a strong foundation in economic theory and the basic quantitative and mathematical tools necessary for professional research. Doctoral students are required to take the basic theory sequence consisting of six courses (ECON 5010, 5020, 5130, 5330, 5110, 5120) and to pass a written qualifying examination in economic theory. The qualifying examination is taken following completion of the first year theory sequence. The examination is given in May and in August. Students who enter the program with advanced standing and have taken courses equivalent to ECON 5010, 5020 and 5110, 5120 are not required to take the theory sequence but are required to pass the qualifying examination. Doctoral students must also demonstrate an ability to use mathematical and statistical tools of re-

search. This requirement may be satisfied by taking courses in Mathematical Economics (ECON 4320 or ECON 5330) and Econometrics (ECON 5350 and 5360) and earning a grade of B or better. Students who have taken equivalent courses elsewhere may demonstrate proficiency by passing the final examinations in ECON 4320, 5350 and 5360 with a grade of B or better.

During the second year, the student chooses two areas of concentration. Two graduate courses (6 hours) must be taken in each area. Additional courses in related fields in economics or other disciplines may be required at the discretion of the faculty in the areas chosen. The optional field in econometrics consists of three advanced econometrics courses. By the beginning of the fifth semester, the student selects the area of concentration in which he/she intends to write his/her dissertation.

After completing the coursework in the two areas of concentration, written examinations in both areas are required. These field examinations may not be taken until the qualifying examination in theory has been passed and proficiency requirements in mathematics and econometrics met.

During the third year, or no later than the fall semester of the fourth year, a graduate committee nominated by the major professor and the director of graduate studies, will conduct an oral examination of the student following successful completion of the field examinations. The purpose of the oral examination is to determine whether the student has formulated a workable dissertation project and has the necessary skills to complete it.

Following successful completion of the dissertation, and completion of 30 hours of dissertation research, the student presents an oral defense to the graduate committee. The doctor of philosophy degree is granted on recommendation of the committee and approval by the Office of the Registrar, providing all other requirements have been satisfactorily fulfilled.

## **Economics (ECON)**

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).**

**1000. Global Economic Issues. 3. [CS,G♦H]** Incoming students are introduced to basic principles of economics through the examination of contemporary global economic problems. Issues include sustainable development, economic causes of wars, global energy dependence, patterns of international capital flows, foreign aid, the brain drain and the

emerging global business community. Topics selected will define the set and level of economic principles introduced.

**1010. Principles of Macroeconomics. 3. [CS♦H]** A beginning study of how economic society is organized and uses scarce resources to provide for its material wants. National income analysis; business cycles; the banking system; monetary and fiscal policy. Inflation and unemployment. Cross listed with AGECE 1010.

**1020. Principles of Microeconomics. 3. [CS♦H]** A basic study of value and price theory, monopoly and public policy; markets for productive goods and services; alternative forms of economic organization; international trade. Cross listed with AGECE 1020.

**1200. Economics, Law and Government. 3. [V♦V]** Markets and free enterprise depend on supportive legal and political institutions. The course exposes students to the U.S. political economy. Important relationships between market development, the legal framework and the political system are presented. The U.S. and Wyoming constitutions are studied to show their importance to free enterprise. Topics deal with public choice, cost-benefit analysis in policy, the importance of property rights and regulation. (Offered fall and spring semesters)

**1300. Oil: Business, Culture, and Power. 3. [CS,G♦(none)]** A multi-disciplinary approach to understanding how oil affects the international relations and commerce. The relationships between oil technology, social and political institutions, the unique cultures in oil-producing regions will be investigated in case studies. Cross listed with ERS 1300.

**1400. Sports Economics. 3. [CS♦(none)]** Examines economic issues pertaining to professional and collegiate sports. Topics include: determinants of player salaries, owner profits and team values; effects of salary caps, revenue sharing, etc. on competitive balance; labor markets and discrimination; antitrust issues, and the impact of franchises on local economies.

**2100. Introduction to Money and Banking. 3.** An introduction to the entire area of money and public finance. Oriented towards students wishing to obtain a broad general understanding of importance of money and public finance upon economic activity. Covers money and private financial institutions, monetary theory and policy, as well as public finance and fiscal policy. Credit will not be allowed for more than one of: ECON 2100 or FIN 4520. *Prerequisites:* ECON 1010, 1020.

**2400. Economics of the Environment. 3. [WB,G♦COM2]** This introductory course examines in detail the relationship between



the economy and the natural environment. Primary attention is given to efficient environmental management and policies. Current environmental issues are studied and evaluated from an economic perspective. *Prerequisites:* ECON 1010, 1020. (Offered based on sufficient demand and resources)

**2500. The Impact of the Union Pacific on Wyoming History. 3.** Students will experience and interpret the impact of the building of the Union Pacific Railroad on the history and culture of Wyoming through the lens of three disciplinary perspectives. Students will explore how the railroad impacted Wyoming geography, economic development and the people of the state through personal research projects. Cross listed with GEOG 2500 and HIST 2500.

**2910. Topics in Economics. 3.**

**3010 [2010, 4010]. Intermediate Macroeconomics. 3.** A presentation and study of national income aggregates and accounting; equilibrium analysis of output, employment and the price level; general equilibrium analysis; and an introduction to economic dynamics. *Prerequisites:* ECON 1010 and 1020, QA and MATH 2200/2350 and sophomore standing. (Offered fall and spring semesters)

**3020 [2020, 4020]. Intermediate Microeconomics. 3.** Relative to a beginning course, this is a more advanced course on the theory of demand, production, cost and supply; and the theory of the firm, including market price under monopoly, monopolistic competition and oligopoly. Attention is given to the theory of factor prices and topics on welfare economics. *Prerequisites:* ECON 1010 and 1020, QA, and MATH 2200/2350 and sophomore standing. (Offered fall and spring semesters)

**4000. Conference. 1-4 (Max. 4).** A tutorial-conference course intended to give economics majors an opportunity to engage in extensive research in some aspect of economics. Specific topics vary with students' needs and interests. *Prerequisites:* ECON 3010, 3020. (Offered fall, spring and summer)

**4030. Managerial Economics. 3.** An advanced course on the theory of demand, production, cost, and supply; the theory of the firm, including market price under monopoly, monopolistic competition and oligopoly. Attention is given to the theory of factor prices and topics on welfare economics. *Prerequisite:* senior standing or above. Credit cannot be earned for this course and ECON 3020.

**4115 [4110, 611]. Time Series Analysis and Forecasting. 3.** Designed to have an applied orientation in a number of estimation procedures, such as exponential smoothing and

forecasting with and without the presence of trends and seasonal repetitive patterns. The Box-Jenkins procedure will be covered in detail. Students become proficient in the application of statistical tools used in time series analysis of economic data. Cross listed with STAT 4115. *Prerequisites:* STAT 3050 or equivalent; STAT 4015/5015 recommended. (Offered based on sufficient demand and resources)

**4230 [4340]. Intermediate Econometric Theory. 3.** Covers simple and multiple regression models, problems of estimation, hypothesis and diagnostic testing, dummy variable, autoregressive and distributed lag models, and time-series analysis. The objective is to understand the underlying theory of econometric modeling and obtain operational ability to construct, estimate, and test econometric models. Cross Listed with AGECE 4230. *Prerequisites:* ECON 3020, STAT 2050 and MATH 2350. (Normally offered spring semester)

**4240. History of Economic Thought. 3. [WC◀COM3]** Focuses on the most influential economists who have shaped the evolution of economic thinking throughout history. Emphasis is on tracing the evolution of economic thought into the modern intellectual foundation of economics. Traces changing economic thought from mercantilism through modern paradigms. *Prerequisites:* ECON 3010 and 3020.

**4320. Mathematical Economics. 3.** A study of the principal mathematical techniques as used in economic theory and modeling. Topics include fundamental concepts underlying marginal analysis, linear programming and comparative statics. *Prerequisites:* ECON 3010, 3020, MATH 2205 or 2355. (Normally offered fall semester)

**4350. Game Theory. 3.** Discusses a variety of important concepts from game theory – the study of how individuals interact strategically. The course focuses on the development of students' ability to think strategically. To that end the course covers basic concepts in game theory; notions related to credibility; and notions related to forming and evaluating strategies. *Prerequisites:* ECON 3010 and 3020.

**4360. Seminar in Economics. 1-3 (Max. 6).** An analysis of selected problems of economics theory. Topics vary with student interest and with current stress in economics theory. *Prerequisites:* ECON 3010, 3020. (Offered based on sufficient demand and resources)

**4400. Environmental Economics. 3.** The study of economic issues involved in development and maintenance of human environment. Problems of resource allocation, social cost, pollution (water and air) and policy issues involved in these areas. Major emphasis is directed toward evaluating welfare implications

of these environmental issues. *Prerequisites:* ECON 3020 and junior standing. (Offered based on sufficient demand and resources)

**4410. Natural Resource Economics. 3.** A study of the economic issues associated with renewable and nonrenewable resources. Special emphasis is directed toward hard rock minerals, fossil fuels, fisheries and forestry resources. Issues of optimal extraction and depletion, effect of alternative market structures, and role of uncertainty are addressed with regard to efficient management and allocation of these resources. *Prerequisite:* ECON 3020 and junior standing. (Offered based on sufficient demand and resources)

**4420. Seminar: Economics for ENR. 2-4.** For students with little or no background in economics interested in economic perspectives on ENR. Emphasis is on integrated ecology-economics approach to investigate the economics environmental services, biological resources, and the ecosystems that contain them. CBEC and ECON majors cannot earn upper-division economics credit for this course. *Prerequisites:* successful completion of QB and senior standing.

**4430. Energy Economics. 3.** Economics of energy, particularly oil and gas. Includes a discussion of the history of the oil industry, as well as aspects of contemporary markets. Apply a variety of concepts from microeconomics, particularly related to industrial economics. *Prerequisites:* ECON 3020, MATH 2200 or 2350.

**4450. Monetary Theory. 3.** Topics in this course center on theories of the value of money and price levels; central banking theory and policy; international exchange; world monetary institutions. *Prerequisite:* ECON 3010, MATH 2200 or 2350. (Offered based on sufficient demand and resources)

**4520. Public Economics. 3.** Studies the role of government within a market economy. The focus is on how governments fund and provide non-market goods demanded by society, e.g., health care, military, education. Examines public goods, taxation, environmental challenges, affects on economic growth and stability, benefit-cost analysis, and state/local finance. *Prerequisites:* ECON 3010, 3020.

**4530. State and Local Finance. 3.** The study of state and local revenues, expenditures, fiscal administration and policies, with special emphasis on Wyoming problems. *Prerequisites:* ECON 1010 and 1020; QA. (Offered based on sufficient demand and resources)

**4700. Economic Development. 3.** Encompasses the study of institutional and social, as well as economic, mechanisms for modernizing an economy while eliminating absolute

poverty. Covers the economic concepts that help us explain why some countries are poor and how economic policies can assist those countries in becoming more developed. Case studies of specific country experiences are presented along with the economic theories in an integrated manner. *Prerequisite:* ECON 3010.

**4710. Comparative Systems. 3.** The study of the origins and characteristics of modern economic systems; similarities and differences in the systems of the U.S., Great Britain, Soviet Union, Germany, India and China. Cross listed with INST 4710. *Prerequisites:* ECON 3010; QA. (Offered based on sufficient demand and resources)

**4720. International Trade. 3.** The gains from specialization and trade are studied, as are explanations of trade patterns among countries, policies affecting trade such as tariffs, quotas, tax breaks, subsidies, cartels and price stabilization plans. Topics on labor migration and multinational corporations are covered. *Prerequisites:* ECON 3020 and junior standing. (Normally offered fall semester)

**4740. International Finance. 3.** The focus is on foreign exchange markets, balance of payments analysis and effects of international trade and capital flows on the domestic economy. Policies to correct payment deficits, gold, international liquidity and international financial institutions are studied. *Prerequisites:* ECON 3010 and 3020; QA.

**4800. Labor Economics. 3.** The study of labor supply, labor demand, wage determination, resource allocation and income distribution. Emphasis is on public policy. *Prerequisites:* ECON 3010 and 3020; QA. (Offered based on sufficient demand and resources)

**4820. Industrial Organization and Public Policy. 3.** The conduct and performance of market structures is analyzed. Structures include perfect competition, monopolistic competition, oligopoly and monopoly. Special attention is given to the study of strategic behavior in industry. Game theory is introduced. Public policy against monopoly practices is reviewed. *Prerequisite:* ECON 3020. (Offered based on sufficient demand and resources)

**4830. Telecommunications Policy and Regulation. 3.** Deals with telecommunications policy and regulation. Major emphasis is placed on specific contemporary issues in telecommunications policy such as the emergence of competition, the states and federal mix of regulations, alternative forms of regulation and technology and competitive industrial structure. *Prerequisites:* ECON 1010 and 1020.

**4840. Public Utility Economics. 3.** The economic foundations of the public utility industries; the theory of public utility rate mak-

ing; pricing and resource allocation; and the effectiveness of utility regulation. *Prerequisites:* ECON 1010 and 1020; QA. (Offered based on sufficient demand and resources)

**5010. Advanced Macroeconomic Analysis. 3.** An advanced application of economic theory to complex macroeconomics problems facing the economy of the state and nation, such as inflation, unemployment, and fiscal and monetary policies. *Prerequisite:* ECON 3010, 3020, or equivalent.

**5020. Advanced Microeconomic Analysis. 3.** A rigorous course in the analysis of demand and the theory of consumer behavior, supply and the theory of the firm, market equilibrium and stability, and income distribution. *Prerequisite:* ECON 3010, 3020, or equivalent.

**5110. Advanced Topics in Economic Theory. 3.** A study of selected topics in modern economic theory. Topics include growth theory, optimal control, dynamics, uncertainty, and game theory. *Prerequisites:* ECON 5010, 5020.

**5115. Time Series Analysis and Forecasting. 3.** An applied introduction to time series and forecasting. Brief coverage of time series regression, decomposition methods, and smoothing will lead into a more detailed coverage of Box-Jenkins (ARIMA) modeling. Computer analysis using MINITAB and SAS will be an important part of the course. Dual listed with ECON 4115; cross listed with STAT 5115. *Prerequisites:* STAT 3050 or equivalent, STAT 4015/5015 recommended.

**5120. Advanced Analysis II-Microeconomics. 3.** Part of a sequence with ECON 5020. It is advanced microeconomic analysis covering general equilibrium and welfare economics, and advanced topics in consumption and production theory. *Prerequisites:* ECON 5010, 5020.

**5130. Dynamic Optimization. 3.** Covers methods for obtaining the optimal choice for economic variables that change over time, including calculus of variations and optimal control. These methods are applied to various dynamic economic problems, including optimal resource extraction, optimal capital allocation, and optimal growth. *Prerequisites:* ECON 5020, 5370.

**5300. Game Theory. 3.** Discusses a variety of important concepts in the application of game theory to modern microeconomics, including Nash equilibrium, subgame perfect equilibrium, and Bayesian Nash equilibrium. Time permitting, the class will also explore some relatively new uses of game theory, including evolutionary games and differential games. *Prerequisites:* admission to the graduate program in Economics and Finance.

**5310. Research Methods. 3.** A variety of topics of importance to the advanced student who is preparing to write his or her dissertation are discussed. *Prerequisite:* admission to the graduate program in Economics and Finance.

**5320. Experimental Methods in Economics. 3.** Accepted experimental techniques in behavioral economics are studied. Critical review of previous experimental work is used to learn proper procedure. The value of subject control and creative construction is stressed. *Prerequisites:* ECON 3010, 3020.

**5330. Advanced Mathematical Economics. 3.** Study of the principal mathematic techniques used in economic theory and modeling. Taught jointly with ECON 5020. *Prerequisite:* graduate standing.

**5340. Applied Econometrics. 3.** Presents a thorough coverage of the general and normal linear regression models. Then proceeds to deal with the standard methodologies for estimating variations of this model including autocorrelation and hetero-skedasticity, extreme multicollinearity, disturbance-related sets of regression equations, simultaneous equation bias, and simultaneous equation models. *Prerequisites:* ECON 3010, 3020 and STAT 2010.

**5350. Advanced Economic Theory I. 3.** Review topics in probability theory and mathematical statistics. Also provides an introduction to the classical linear regression model, estimation, hypothesis testing, and prediction. *Prerequisites:* Calculus and Basic Statistics.

**5360. Advanced Economic Theory II. 3.** Continue the analysis in ECON 5350 and cover topics such as panel data, limited-dependent variables, simultaneous systems, nonlinear models, Bayesian analysis, and time series methods. *Prerequisites:* ECON 5350.

**5370. Advanced Econometric Theory III. 1 - 3 (Max 9).** More in-depth coverage of topics in ECON 5350 and 5360. Topics are selected based on current advancements in econometrics and students' research interests and may include generalized method of moments (GMM), nonparametric estimation, state-space models and the Kalman filter, mixed and nested logit models, multinomial discrete-choice models, and simulated maximum likelihood. *Prerequisite:* ECON 5360.

**5400. Advanced Resource and Environmental Economics. 3.** An analysis of resource development projects and environmental change. Included are cost-effectiveness analysis and other quantitative techniques used in evaluating resource projects and public policy issues concerning the environment. *Prerequisite:* ECON 3020, 4400 or consent of instructor.

**5410. Seminar in Advanced Resource and Environmental Economics. 1-3 (Max. 6).**

This course explores recent theoretical and empirical advances in natural resources and environmental economics. The lectures and seminars will be organized around the following key topics: land use and soil erosion; forestry for timber and non-timber benefits; valuing non-market ecological functions; trade and resources use; resources management under uncertainty; and sustainable development. *Prerequisites:* ECON 4400 and ECON 5020.

**5520. Theory of Public Finance. 3.** A survey course covering welfare foundations of public finance, theory of public goods, benefit-cost analysis, fiscal federalism, the economics of taxation (incidence analysis, excess burden and optimal taxes), the U.S. tax system, and tax issues in open economics. *Prerequisite:* ECON 5010, 5020 or equivalent.

**5640. Financial Economics I. 3.** Focuses on theoretical topics. Covers optimal portfolio selection under uncertainty and differential information as well as fundamental theoretical issues in banking and financial intermediation. In the latter part of the semester, students have an opportunity to present one of the assigned articles in class and lead a discussion on it, with active participation by the entire class. *Prerequisites:* PhD-level microeconomics class (5020) and at least one 4000-level finance class.

**5650. Financial Economics II. 1-3 (Max. 6).** Topics include corporate finance, capital structure and the theoretical valuation of financial securities; also, asset pricing and financial econometrics. *Prerequisite:* ECON 5640.

**5700. Advanced Economic Development. 3.** Explores basic growth theory, "economic history" models of economic expansion, theories of natural resource based development and trade-resource models, the role of institutions and public policy in influencing development, and the effects of population, trade and finance on development. *Prerequisites:* ECON 5010, 5020.

**5720. Advanced International Economics. 3.** Studies the economics of trade between nations. Important trade theories are studied along with their empirical evaluation. Time is devoted to the importance of international trade growth. Government trade policies are given theoretical and empirical evaluation. *Prerequisite:* ECON 5020.

**5730. Advanced Regional Analysis. 3.** An advanced study of regional economic models. Included are structural and simulation models, regional growth models, and income estimation models. Emphasis is placed on

quantitative analysis of regional growth and development. *Prerequisite:* ECON 3010, 3020 and 4600 or equivalents.

**5820. Advanced Industrial Organization and Public Policy. 3.** An application of market and price theory to concentration, size, competition; antitrust; close-knit and loose-knit combinations; business practices; price leadership and discrimination; delivered pricing; fair trade; unfair competition; and public policy. *Prerequisite:* ECON 5010, 5020, or equivalent.

**5830. Empirical Industrial Organization. 3.** Focuses on methods of analyzing data and testing hypotheses arising in the field of industrial organization. Much of the material builds on concepts introduced in ECON 5020 along with concepts presented in econometrics classes. Although many of the relevant concepts are primarily covered in ECON 5820, this course can be taken before or without taking ECON 5820. *Prerequisite:* admission to the graduate program in Economics and Finance.

**5840. Advanced Public Utility Economics. 3.** Explores the contribution that economics can make to government regulation of business. Regulation theory is concerned with defining the goal of economic efficiency and providing rules for achieving it. Specifically covers market structures, systems of incentives, laws and administrative procedures, and economic performance in the field of regulation. *Prerequisite:* ECON 4840 or equivalent.

**5890. Seminar in Advanced Economics. 1-3 (Max. 9).** An advanced tutorial-conference course intended to give graduate students experience in research in economic problems. *Prerequisite:* consent of instructor.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for

students whose coursework is complete and are writing their thesis. *Prerequisites:* enrolled in a graduate degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Finance Major

Modern Business is characterized by its emphasis upon finance. The application of sound financial management principles often will be the difference between success and failure in business.

Courses prescribed for those who wish to major in finance are designed to provide a background for financial management of business concerns and, if students desire, to specialize in bank management, corporation finances, investment management and real estate. Since financial policies of business enterprises are subject to economic principles which make all businesses financially interdependent and sensitive to disturbances in the economic structure, students in this field should study the economic, as well as the technical, administrative aspects of finance and accounting. Prescribed work in this area attempts to emphasize all three phases of the subject.

All finance majors must comply with requirements of the advanced business prerequisite for enrollment in upper-division courses.

Finance majors must hold a 2.5 cumulative grade point average in all finance courses at graduation, as well as a minimum 2.50 cumulative grade point average and a minimum 2.50 grade point average in all College of Business courses.

In addition to university and college requirements cited previously, requirements for business economics majors include:

	Hrs.
1. FIN 3310, 3520, and 4250.....	9
2. Finance electives .....	6
3. Accounting elective.....	3
(junior or senior level)	
4. Economics electives.....	6
5. Restricted electives.....	3
(Must be junior/senior level FIN, ACCT or ECON courses)	

A complete curriculum sheet is available from the College of Business Academic Advising Office.

## Finance (FIN)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**2010 [3010]. Personal Finance and Investments. 3.** A general course treating the fundamentals and organization of the securities markets, types of orders, elementary market computations, basic investment management and etc. For students university-wide who have an interest in investments.

**3100. Real Estate Development. 3.** This course presents the basic principles involved in real estate development. Topics include: land acquisition and appraisal, site improvements, market feasibility analysis, development financing, real estate government approval and regulations, real estate engineering and construction issues, real estate marketing and property operations and performances. *Prerequisite:* ACCT 1010.

**3250. Corporate Finance. 3.** Deals with management of capital in a business firm. It treats policies and actions relating to asset structure, risk, income and cash flows. Operating and financial analysis is introduced. *Prerequisites:* ACCT 1010 and STAT 2010, 2050, or 2070 and sophomore standing.

**3310 [4310]. Investment Management. 3.** Fundamental principles of investments and practical implications of financial theory. Students acquire a framework for understanding returns on financial assets, risk and return, fundamentals of portfolio theory, efficient market hypothesis, and asset pricing models. Other topics include financial statement analysis, behavioral finance, and introduction to options and futures. *Prerequisites:* FIN 3250 and advanced business standing.

**3520 [4520]. Financial Markets and Institutions. 3.** Portfolio and capital market theory and the analysis of risk are introduced. Integrates theory into practical aspects of financial markets and management of financial institutions. *Prerequisites:* FIN 3250, STAT 2010 or 2050/2070, IMGT 2400 and advanced business standing.

**4100. Internship: Finance. 1-4.** Provides students with practical business knowledge, policy, procedures and decision making. Students work as interns in operating organizations. *Prerequisites:* FIN 3250 and advanced business standing, written consent from instructor. (May not be used to substitute an Economics or Finance elective)

**4250. Advanced Corporate Finance. 3.** Give students a better appreciation of the techniques and theories of corporate finance and

investments that may have been introduced in introductory finance courses. *Prerequisites:* FIN 3250, 3310.

**4340. Portfolio Management. I. 3.** Manage, monitor and invest real money provided by the State of Wyoming and the University of Wyoming Foundation. Students should obtain from the course the ability to construct investment portfolios from scratch, to learn the signals from which to obtain sell and buy data and the ability to act on this information. *Prerequisites:* FIN 3310, advanced business standing and a written recommendation from the professor teaching the course.

**4350. Portfolio Management II. 3.** Manage, monitor and invest real money provided by the State of Wyoming and the University of Wyoming Foundation. Students should obtain from the course the ability to construct investment portfolios from scratch, to learn the signals from which to obtain sell and buy data and the ability to act on this information. *Prerequisites:* FIN 3310, advanced business standing and a written recommendation from the professor teaching the course.

**4360. Options and Futures. 3.** Provides an introduction to financial futures such as currency futures and interest rate futures. Explores the markets on which they are traded. Also analyzes pricing of options and other derivative securities. Includes the leverage and risk aspects of options. *Prerequisite:* FIN 3250, 3310.

**4400. Empirical Finance. 3.** Involves the application of basic econometric methods to the analysis of financial data. The course is focused on empirical estimation and analysis of theoretical financial models. The study of market microstructure models and other characteristics of financial data are included. Dual listed with FIN 5400. *Prerequisites:* FIN 3250, FIN 3310, IMGT 2400 and advanced business standing.

**4410. Behavioral Finance. 3.** Discusses popular and accepted theories of human behavior from the field of psychology to investigate features of irrational behavior in the financial markets. Topics covered include fundamental behavioral biases, behavioral asset pricing, investor behavior, and consequences of irrationality to financial markets at the aggregate level. *Prerequisites:* FIN 3250, FIN 3310.

**4420. Long-Term Capital Management. 3.** A course designed to give students exposure to extensive analysis of problems in management of capital structure and capital expenditures. *Prerequisites:* FIN 3250, FIN 3310, STAT 2010 or equivalent, IMGT 2400 and advanced business standing.

**4460. Multinational Finance. 3.** Deals with quantitative techniques used by financial managers and investors in global financial markets. Topics covered include exchange rate determination, management of foreign exchange exposure, international portfolio investment, and current topics in international finance. *Prerequisite:* FIN 3250, 3310.

**4510. Bank Management. 3.** Deals with financial decision-making in financial institutions, particularly emphasizing commercial banks. Topics covered include managing financial assets, deposit acquisition and capital management. *Prerequisites:* FIN 3250, IMGT 2400 and advanced business standing.

**4540. Banking Policy. 3.** Intended to be taken either with or after FIN 4510, Bank Management, and will cover similar topics but in greater depth and breadth. Integrated application of these topics will take place in a selection of case studies, some of which will be analyzed in teams. *Prerequisites:* FIN 4510 or concurrent enrollment in FIN 4510.

**4560. Entrepreneurial Finance. 3.** Expands business knowledge by focusing attention on accounting and finance concerns that are vital to new ventures. Focuses on issues that must be addressed to assist these businesses in meeting their objectives of growth, preparation for a public offering, and exit strategies. Cross listed with MGT 4560. *Prerequisites:* ACCT 1010, MGT 3210, FIN 3250.

**4610. Real Estate and Urban Economics. 3.** Discusses the physical, legal and economic fundamentals of real estate using an integration of real estate markets, mortgage financing, appraisal principles, and investment analysis. Topics include basic property and contract law, leases, financing, taxation, and the fields of property management, finance, appraisal, brokerage, and investments. *Prerequisite:* Advanced business student.

**4710. Risk Management. 3.** Analyzes the risk management and insurance problem in the business enterprise with emphasis on methodology for risk analysis; techniques for risk and loss control; and models for risk management decision-making. *Prerequisites:* FIN 3250, FIN 3310, IMGT 2400 and advanced business standing.

**4800. Real Estate Finance. 3.** Exposes students to the fundamentals of real estate finance such as mortgage financing, commercial leases, pro-forma analysis, financial modeling, tax implications, leveraged real estate and valuation of income producing properties. While the theory of each topic will be presented, the focus is on the applications of the material. *Prerequisites:* FIN 3250 and advanced business standing.

**4810. Real Estate Investment. 3.** Covers advance real estate investment topics such as investments risk and valuation sensitivity analysis, futures and real options, liquid real estate investments, analysis of development projects, and commercial mortgage backed securities. While the theory the topics will be presented, the course focus is on the application of the material. *Prerequisites:* FIN 4800 and advanced business standing.

**4900. Problems in Finance. 1-4 (Max. 4).** Students register on an individual basis to study any phase of finance not included in organized courses. Written report required. *Prerequisites:* FIN 3250, IMGT 2400, advanced business standing, senior standing and written consent of instructor.

**4910. Selected Topics in Finance. 3 (Max. 6 seniors and M.S.; Max. 9 Ph.D.).** The material covered involves extensive in-depth investigations into topics which are specialty areas of the instructor in charge in any given term. *Prerequisites:* 9 hours in finance including FIN 3250, IMGT 2400 and advanced business standing.

**5000. Macroeconomics and Management Finance. 3.** Introduction to macroeconomics and management finance. Macroeconomics helps define the environment in which firms make financial decisions. *Prerequisite:* ACCT 2010, STAT 2010, MATH 2350 or 2355.

**5310. Investment Management and Analysis. 3.** The theory of investment management and security values, portfolio management including the analysis of investment policies and objectives, the analysis and use of investment information, and the development and application of the tools for determining values. *Prerequisite:* FIN 5510 and graduate standing.

**5320. Corporate Finance and Governance. 3.** Designed to provide a framework to analyze issues in corporate finance and governance. The firm is viewed as a nexus of contracts designed to reduce the costs of trade-and corporate finance is regarded as an investigation of the incomplete contracts that involve the providers of capital. *Prerequisites:* FIN 3250 (or equivalent); admission to the Master of finance, Graduate Program in Economics and Finance or Master of Accounting.

**5400. Empirical Finance. 3.** Involves the application of basic econometric methods to the analysis of financial data. The course is focused on empirical estimation and analysis of theoretical financial models. The study of market microstructure models and other characteristics of financial data are included. Dual listed with FIN 4400. *Prerequisites:* FIN 3250, IMGT 2400 and advanced business standing; graduate standing.

**5510. Financial Management. 3.** Studies of environmental influences on corporate financial decision making and measurement devices useful in corporate financial management. *Prerequisite:* MATH 2220, STAT 2020, ACCT 2020, COSC 1200 or equivalent; accepted in a graduate program.

**5520. Seminar in Finance Theory. 3.** Deals with the theory and application of security analysis and portfolio management. *Prerequisite:* FIN 5510 or equivalent; accepted in a graduate program.

**5810. Real Estate Appraisal. 3.** Covers the basics of appraisal, the three main approaches to valuation, reconciliation, and report. Topics of mass appraisal and multiple regression analysis are also considered. Deals with elements of real estate appraisal as they apply to residential, commercial/industrial and rural real property. Dual listed with FIN 4810. *Prerequisites:* FIN 3250 and advanced business student.

**5890. Advanced Problems in Finance. 1-9 (Max. 9).** An arrangement whereby a student is permitted to develop an advanced phase of finance not offered in the formally structured courses or to investigate a finance problem, a written report is required. *Prerequisite:* 9 hours in finance and consent of instructor.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrolled in a graduate degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Department of Management and Marketing

College of Business 354, 766-3124

FAX: (307) 766-3488

Web site: business.uwyo.edu/mgmtmkt

Department Chairman: Roland Kidwell

### Professors:

**STACEY K. BAKER**, B.S. University of Nebraska—Lincoln 1990; M.B.A. 1992; Ph.D. 1996; Professor of Marketing and Sustainable Business Practices 2014, 2003.

**ROLAND E. KIDWELL JR.**, B.S. University of Maryland 1978; M.B.A. Radford University 1987; Ph.D. Louisiana State University 1994; Professor of Management 2011, 2005.

**TIMOTHY C. MAZUR**, A.B. San Diego State University 1986; M.B.A. The George Washington University 1989; Bill Daniels Distinguished Professor of Business Ethics 2014-16.

**RICHARD C. MCGINITY**, A.B. Princeton University 1966; M.B.A. Harvard Business School 1973; D.B.A. 1980; Bill Daniels Chair of Business Ethics 2007; Professor of Management and Marketing 2009; President of the University 2013.

**JOHN MITTELSTAEDT**, B.A. Saint Olaf College 1986; M.T.S. Harvard University 1989; Ph.D. University of Iowa 1995; Professor of Marketing 2011.

**C. MARK PETERSON**, B.A. University of Virginia 1978; M.S. Georgia Institute of Technology 1989; Ph.D. 1994; Professor of Marketing 2014, 2007.

**SANJAY PUTREVU**, M.M.S. Birla Institute of Technology and Science 1997; Ph.D. University at Buffalo, State University of New York 1992; Professor of Marketing 2015.

**JOSE A. ROSA**, B.S. General Motors Institute 1977; M.B.A. Dartmouth College 1979; M.A. University of Michigan 1992; Ph.D. 1992; Professor of Marketing and Sustainable Business Practices 2008.

**KELLY TIAN**, B.S. University of Alabama 1982; M.A. University of Alabama 1985; Ph.D. Georgia State University 1991; Professor of Marketing 2012.

**PHILIP E. VARCA**, B.A. Florida State University 1971; M.S. Louisiana State University 1975; Ph.D. 1978; Professor of Management 2008, 1989.

**LARRY R. WEATHERFORD**, B.A. Brigham Young University 1982; M.B.A. University of Virginia 1990; Ph.D. 1991; Professor of Decision Science 2002, 1991.

**Associate Professors:**

**KENT G. DRUMMOND**, B.A. Stanford 1980; M.B.A. Northwestern University 1982; Ph.D. The University of Texas, Austin 1990; Associate Professor of Marketing 2002.

**GRANT L. LINDSTROM**, B.S. Utah State University 1981; M.B.A. University of Utah 1986; Ph.D. 1989; Associate Professor of Management 1996, 1990.

**STEPHANIE A. ONETO**, B.S. University of Nebraska-Lincoln 1999; M.A. University of Houston 2001; Ph.D. 2007; Associate Professor of Marketing 2014, 2007.

**TERRIL. RITTENBURG**, B.S. University of Nebraska-Lincoln 1978; M.A. 1980; Ph.D. 1988; Associate Professor of Marketing 1995, 1989.

**ROBERT D. SPRAGUE**, B.S.B.A. University of Denver 1980; J.D. 1985; M.B.A. University of Southern California 1999; Associate Professor of Legal Studies in Business 2010, 2004.

**Assistant Professors:**

**ANDREW ARNETTE**, B.S. Virginia Polytechnic Institute & State University 2000; M.B.A. Virginia Polytechnic Institute & State University 2002; Ph.D. Virginia Polytechnic Institute & State University 2010; Assistant Professor of Decision Science 2012.

**BARRY L. BREWER**, B.S. United States Air Force Academy 1991; M.S. Air Force Institute of Technology 1995; Ph.D. Arizona State University 2006; Assistant Professor of Decision Science 2011.

**JARON HARVEY**, B.S. Utah Valley University 2006; Ph.D. University of Oklahoma 2010; Assistant Professor of Management 2012.

**STEPHEN JONES**, B.S. Oregon State University 2002; M.B.A. Brigham Young University 2010; A.B.D. University of Minnesota 2015; Assistant Professor of Management 2015.

**KRISTA B. LEWELLYN**, B.S. Syracuse University 1986; M.S. Georgia Institute of Technology 1988; M.B.A. Robert Gordon University 2003; Ph.D. Old Dominion University 2013; Assistant Professor of Management 2014.

**ELIZABETH A. MINTON**, B.S. University of Alaska Southeast 2008; M.B.A. Idaho State University 2010; Ph.D. University of Oregon 2014; Assistant Professor of Marketing 2014.

**Academic Professionals:**

**R. CLIFFORD ASAY**, B.S. Brigham Young University 1991; M.B.A. Portland State University 1998; Associate Lecturer 2011, 2006.

**COREY A. BILLINGTON**, B.S. Stanford University 1981; M.S. 1981; Ph.D. 1987; Visiting Professor in Entrepreneurship and Innovation 2015.

**TORI KRICKEN**, B.S. University of Wyoming 1996; J.D. 2000; Lecturer of Management 2014.

**Professors Emeriti:**

Robert E. Allen, John H. Jackson, Anthony F. McGann, J. Brooks Mitchell, Robert G. Roe, Jack C. Routson, Samuel G. Taylor

The Department of Management and Marketing offers programs of study leading to the Bachelor of Science degree in (1) Management, (2) Marketing, (3) Business Administration (online only starting Fall 2015). The departmental requirements for each of these degree programs are listed below.

All majors in the Department of Management and Marketing must meet requirements of the advanced business prerequisite for enrollment in upper-division courses, must complete the common body of knowledge courses as listed previously and require a minimum grade of C for courses in their major and MGT 4800.

Students outside the business major may take business courses, and are not held to advanced business standing requirements, but they should first check with course instructors to see if they meet other prerequisites. The College of Business Academic Advising Office (COB/AAO) oversees the formal petition process that provides non-majors permission to take business courses, and COB/AAO should be the next step in getting permission after getting consent of the instructor.

Business and accounting 3000- and 4000-level courses are reserved for those with junior or senior level standing whether majors or non-majors unless otherwise noted.

**Entrepreneurship Emphasis**

The college recommends entrepreneurship as an area of study for business students, and others as well. Entrepreneurship focuses on starting businesses and is useful for all those students who think they might want to own and run their own business some day. It is formally available as a minor.

A minor in entrepreneurship features business courses likely to be important to the creator of a new venture and/or the owner-operator of a growing business or family business. The minor includes exposure to entrepreneurs and entrepreneurship, creation of

a new business concept, and formulation of a business plan that can serve as a springboard for a new venture.

**Graduate Study**

The Department of Management and Marketing staffs most of the MBA classes (on-campus and eMBA) although the degree is a college-wide degree. Further, the department offers a Ph.D. in Marketing with an emphasis in Sustainable Business Practices. Some 4000- and 5000-level classes may be counted as graduate classes in other programs.

**Business Administration**

Students who elect to major in the business administration curriculum acquire a comprehensive understanding of business as a whole. Through exposure to all functional areas in business, students are afforded the opportunity to develop broad skills and knowledge. The business administration degree prepares students for a wide variety of career opportunities in business and government. Business Administration major only available online starting Fall 2015.

In addition to university, college and departmental requirements cited previously, requirements for business administration majors include:

<b>Core Requirements</b>	<b>Hrs.</b>
<b>1. Accounting/Finance .....</b>	<b>6</b>
ACCT 2110, FIN 4XXX (choice of 4000-level finance course)	
<b>2. Management/Decision sciences .....</b>	<b>12</b>
MGT 3110, 4340, 3410, DSCI 4240	
<b>3. Marketing .....</b>	<b>3</b>
MKT 4430	
<b>4. Restricted electives.....</b>	<b>6</b>
Chosen in consultation with adviser.	

A complete curriculum sheet is available from the College of Business Academic Advising Office.

**Decision Sciences**

The decision sciences curriculum is designed to serve students with a variety of majors. A minor in decision sciences is available for students wishing to augment their major with quantitative and computer-based decision-making tools. Decision sciences courses emphasize applications to supply chain operations management.

## Decision Sciences (DSCI)

### 3210 [OM 3210]. Introduction to Operations and Supply Chain Management. 3.

An introductory course in production and operations management. Typical topics include operations strategy, quality management, facilities location, facilities layout, forecasting, inventory management, production planning, scheduling and project management. *Prerequisites:* IMGT 2400 or equivalent, MATH 2355 or equivalent, STAT 2010 or equivalent and advanced business standing.

**4230. Purchasing and Supply Management. 3.** Examines how to manage supply function. Topics include organization, planning procedures, category management, supplier selection, quality, inventory decisions, ethical and profession standards, costing, and price determination. *Prerequisite:* DSCI 3210.

**4240. Computer Applications in Decision Sciences. 3.** A study of decision science topics such as mathematical programming, Monte Carlo simulation, forecasting, project management and decision theory. The applications of computer techniques is emphasized. *Prerequisites:* IMGT 2400 or equivalent, DSCI 3210, STAT 2010 or equivalent and advanced business standing.

**4250. Revenue Management. 3.** Examines the tools used by many industries in the service sector to maximize revenue, including forecasting demand, overbooking customers, group decision making, how to allocate fixed assets, and control of the overall network. *Prerequisites:* DSCI 3210, advanced business standing.

**4260. Project Management. 3.** Examines the coordination project management activities. This includes the initiation, planning, implementation, control and evaluation of projects. *Prerequisites:* (DSCI 3210 and advanced business standing), or ES 1060 and junior standing.

**4270. Logistics. 3.** Presents a synthesis of the principles in logistics activities resident in the supply chain. The course emphasizes how to manage the operation and integration of transportation (inbound and outbound), inventory, warehousing, facility location, customer service, packaging and materials handling. *Prerequisites:* DSCI 3210, DSCI 4240, junior class standing, Advanced Business Standing.

**4280. Supply Chain Management. 3.** Examines the coordination of material flows and information through networks of suppliers, producers, warehouses, and customers that are linked by transportation modes. *Prerequisites:* DSCI 3210, advanced business standing.

**4900 [OM 4900]. Problems in Decision Sciences. 1-4 (Max. 4).** Studies, on an individual basis, any decision science topic not included in currently offered courses. *Prerequisites:* DSCI 3210, advanced business standing, senior standing and written consent of instructor.

**4910 [OM 4910]. Selected Topics in Decision Sciences. 3.** For advanced students treating contemporary problems in decision science related areas. Specific area(s) to be considered in a given semester will be printed in class schedule. *Prerequisite:* junior class standing and other courses, as appropriate, for specific area/topic being covered. Obtain permission and specific listing of prerequisites for enrollment from the College of Business Academic Advising Office before registering.

**5890. Advanced Problems in Decision Science. 1-8 (Max. 8).** An arrangement whereby a student is permitted to develop some advanced phase of decision sciences not offered in the formally structured courses or to investigate a particular decision sciences problem. A written report is required. *Prerequisite:* consent of instructor and acceptance into a graduate program.

## International Business

The international business curriculum is designed to serve students with a variety of major. A cross-disciplinary minor in international business is offered to students who want to augment their majors with exposure to global management, finance, economics, accounting and/or a study abroad experience.

A curriculum sheet with the international business minor requirements is available from the College of Business Academic Advising Office.

## International Business (INBU)

**1040 [BUSN 2000]. Introduction to International Business. 3.** A broad survey of the field of international business which introduces basic concepts of international business activity and theory and reviews major foreign environmental forces--financial, economic and socioeconomic, physical, sociocultural, political, legal, labor, competitive and distributive--within the context of strategic management issues. Cross listed with INST 1040.

**3110. Global Business Ethics. 3.** This course will provide students with fundamental grounding in business ethics and corporate social responsibility, including recent developments related to universal principles for ethical business practice. Students will gain tools for

ethical decision making in the global context to maintain sustainable businesses for the 21st century. *Prerequisite:* junior class standing.

**4570 [BADM 4540; BUSN 4540]. Global Business Issues. 1-6 (Max. 6).** Designed to give students a broad overview of current issues in international business. Includes classroom instruction and may include travel to a foreign country and visits to major foreign firms. A written assignment is required. Dual listed with INBU 5570. *Prerequisite:* consent of instructor.

**4900 [BUSN 4900]. Problems in International Business. 1-4 (Max. 4).** Individual projects of a research nature, under direct supervision of a professor. Written report required. *Prerequisite:* consent of instructor.

**4910 [BUSN 4910]. Selected Topics in International Business. 3.** For advanced students; consists of an in-depth study of a selected area of international business. Specific area(s) to be considered in any given semester are printed in the class schedule. Topics may include globalization and business, international accounting, international management and negotiation, or topics related to doing business in a particular country or region. *Prerequisites:* junior standing and other courses, as appropriate, for specific area/topic being covered.

**4920 [BUSN 4920]. International Business: Study Abroad. 1-6 (Max. 6).** Credit for course work related to international business undertaken at foreign institutions. Students are responsible for submitting course materials for evaluation for credit by College of Business faculty prior to enrolling. Students arrange for the foreign institutions to send performance evaluations to the College of Business Academic Advising Office. *Prerequisite:* consent of department head.

**5570 [BADM 4540; BUSN 5540]. Global Business Issues. 1-6 (Max. 6).** Designed to give students a broad overview of current issues in international business. Includes classroom instruction and may include travel to a foreign country and visits to major foreign firms. A written assignment is required. Dual listed with INBU 4570. *Prerequisite:* consent of instructor.

## Management

Successful management requires the effective use of an organization's resources. Planning, organizing, leading, measuring, and controlling what goes on in the organization are critical management jobs. To do them successfully, managers need understanding/skills in dealing with behavior and leadership at work, changing organizations, supervising

others, designing human resource systems, promoting innovation, managing risk and information, negotiating, and decision making.

The curriculum leading to a degree in management is designed to provide the perspectives and tools necessary to help a motivated student move into a career in management.

Students may choose among 3 concentrations (of 12-18 credit hours) in the management major.

**Management Consulting**

The Management Consulting concentration prepares students to be capable of managing different processes and people, so that they can work in both large and small organizations, or consult with organizations about these issues. A particular emphasis is to help students develop both interpersonal and financial analysis skills so they are capable of resolving a broad spectrum of problems for a variety of different types of organizations. This concentration is designed to provide students with a large degree of flexibility when considering different career paths, because students will be prepared to systematically think through the processes that organizations use to create and maintain sustainable competitive advantage. The concentration prepares students to work in for-profit businesses, non-profit organizations, entrepreneurial ventures, or in government organizations.

**Entrepreneurship**

The Entrepreneurship concentration is designed to assist students who wish to start their own businesses by providing them with exposure to the development and testing of business concepts, analyzing the potential success of their concepts using a variety of tools and techniques, being flexible in developing new businesses and innovative ideas, and formulating and implementing business plans that will assist in the establishment and growth of new ventures. The concentration also provides students with exposure to issues involving family firms such as governance, succession and interpersonal relationships as well as innovation and change in existing organizations. Thus, the concentration focuses on entrepreneurship in both new ventures and established firms and prepares students to 1) start new businesses, 2) innovate in their own family firms, and/or 3) be entrepreneurial in an existing business.

**Supply Chain**

The Supply Chain concentration involves the planning, control, and coordination of materials and services from raw materials to customers. Increasing competitiveness through quality, cost, responsiveness, and innovation is essential to supply chain and company success. It is critical to manage processes across boundaries in the firm and across firms that make up the supply chain. Course work will prepare students for managerial positions in the manufacturing and service industries in areas of purchasing, operations, logistics, and customer service.

*Hrs.*

**Management core..... 12**

Ethics 3110 (MGT, MKT, INBU), MGT 3410, 3420, 4470

A complete curriculum sheet is available from the College of Business Academic Advising Office.

**Management (MGT)**

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).**

**1040 [2010, BADM 1040]. Legal Environment of Business. 3.** Provides a broad overview of business-related legal topics. Students are familiarized with courts and alternative dispute resolution, constitutional law, torts, contracts, intellectual law, criminal law, and cyber law.

**2000 [BADM 2005]. Introduction to Business. 3.** Designed to provide an overview of today's business system and how it works. Significant business activities are covered including: accounting, management, marketing, production, finance, decision making, economic markets, and world business. Recommended for those who might have an interest in business, but no real background. *Prerequisite:* freshman or sophomore standing only.

**2600 [BADM 2600]. Internship in Business. 1-4.** Provides students with practical business knowledge and a perceptual basis for later coursework. Students work as interns in operating organizations. *Prerequisites:* COB Majors only and written consent of instructor.

**3110 [BADM 3210]. Business Ethics. 3.** Studies the cognitive, social, behavioral, and corporate processes affecting individual, group, and organizational judgments in morally questionable situations. Through analysis students understand what factors give rise to and influence ethical issues and how organization values precipitate ethical behavior among employees. *Prerequisites:* sophomore standing.

**3210. Management and Organization. 3.**

An introduction to the theory and practice of management with emphasis on individual and small group behavior, design and structure of organizations, relationship between the organization and its environment and statistical and quantitative skills used in examination of management processes. Also covers interpersonal communications, ethics and international management. *Prerequisite:* sophomore standing and completion of COM1.

**3340 [BADM 3000]. Real Estate Law. 3.**

Covers all major areas of real estate law, including the nature of real property, types of ownership, real estate contracts, title and insurance, financing, landlord and tenant, land use, environmental law and regulation. An understanding of real estate law is important in both the personal and professional lives of students. *Prerequisite:* Advanced business standing.

**3410 [4410]. Human Resources Management. 3.**

A study of the formal systems used to manage people at work. Emphasis is on concepts and procedures of EEO, diversity, job analysis, job evaluation, wage and salary administration, performance evaluation, safety, employee services and fringe benefits. *Prerequisites:* MGT 3210 and advanced business standing.

**3420 [4420]. Organizational Behavior and Leadership. 3.**

An interdisciplinary study of individual, group, and organizational processes that affect employee behavior at work. Prepares students for various managerial roles by synthesizing successful leadership practices in both domestic and international settings and by examining critical areas such as individual differences, organizational politics and culture. *Prerequisites:* MGT 3210 and advanced business standing.

**4340 [BADM 4340]. Law for Managers. 3.**

Provides an overview of laws and legal issues associated with managing a business, incorporating aspects of sustainable business practices. Topics include agency and employment, business organizations, including securities laws and corporate governance standards, government regulation of businesses, including environmental/sustainability regulations, and an introduction to international law and global economy. *Prerequisite:* MGT 1040 or equivalent.

**4350 [BADM 4350]. Commercial Law. 3.**

A study of the basic principles of commercial law, including property, sales, negotiable instruments, secured transactions, creditors' rights and bankruptcy. *Prerequisites:* MGT 1040 or equivalent.



**4360. Business Law for Entrepreneurs. 3.**

A survey of the various legal issues confronted by entrepreneurs, particularly related to new ventures. *Prerequisite:* MGT 1040.

**4425. Supervision. 3.** Focuses on interactions with direct report employees. Influence, work maturity, integrity, work standards, communication skills, team management, doing performance appraisal, managing customer service, training, and interviewing are among the supervisory topics. *Prerequisites:* MGT 3210, MGT 4410 or MGT 4410 concurrently; advanced business standing.

**4430. Organization Design and Change. 3.** Examines organizations, what they are, how they operate and are structured and how they can be changed. Focus is on macro managerial issues in the design and change of work organizations. *Prerequisites:* MGT 3210 and advanced business standing.

**4440. Managing Innovation and Problem Solving. 3.** Focuses on individual creativity and the resulting issues of intellectual property in organizations. Further considers making decisions and solving problems in modern organizations. Examines individual, group, and organizational influences and decisions. Topics include problem solving models, human information processing, creativity, leader decision style, managing decision teams. *Prerequisites:* MGT 3210 and advanced business standing.

**4445. Managing Risk and Knowledge. 3.** Focuses on the assessment and mitigation of property, liability, human resources, and income risks. Knowledge management explores strategies for profiting from technology assets and technological innovation. Includes the role of strategy, core competencies, product development, strategic partnership, and more. *Prerequisites:* MGT 3210 and advanced business standing.

**4455. Systems Analysis and Design. 3.** Concerned with the analysis, management, and conceptual design of information systems. Specific topics include systems planning, requirements analysis, business process modeling and redesign, flexibility analysis, alternative analysis, and architectural selection and design focused on supporting an organization's business requirements through various system design methodologies. Cross listed with IMGT 4455. *Prerequisite:* IMGT 2400.

**4465. Managerial Tools. 3.** Supply commonly used tools for managers, including those for controlling operations – budgeting, financial forecasting and analysis using ratios, risk assessment and control, management audits, monitoring, clan control, and employee discipline systems. Planning tools include

strategic and operational plans, goals, MBO, succession, disaster, contingency and scenario planning. *Prerequisites:* MGT 3210, MGT 4420 or MGT 4420 concurrently; advanced business standing.

**4470. Managerial Negotiation and Conflict Resolution. 3. [(none)◀COM3]** Focuses on all aspects of formal managerial negotiation including dealings with suppliers, buyers, unions and etc. Also examined are the theory and practice of interpersonal negotiation. Conflict resolution is approached by identifying types and sources of conflict, organizational parameters of conflict, as well as resolution skills and behavior. *Prerequisites:* MGT 3210 and advanced business standing.

**4500 [BADM 4500]. Employee to Entrepreneur. 3.** Investigates considerations relating to leaving current employment, ethical dilemmas, skills needed to launch a new business, importance of cash flow and financing start-up, personal rewards and costs of entrepreneurship, and an overview of business plan context. *Prerequisite:* Sophomore standing.

**4510 [BADM 4510]. New Entrepreneurial Venture. 3.** Focus is on creating a successful business concept and determining its feasibility in the context of a rapidly changing global business environment. Students research, analyze and present a new business concept, which may evolve into a comprehensive business plan. *Prerequisites:* MGT 3210, ACCT 1010, junior standing.

**4530 [BADM 4620]. Business Plan Development. 3.** Explores and evaluates various intrapreneurial and entrepreneurial opportunities, including business plans. Students demonstrate how to research, analyze, and present new business ventures. Students will analyze a business opportunity and make a presentation to potential investors. *Prerequisite:* MGT 4510 and junior standing.

**4550. Family Business and Corporate Venturing. 3.** Investigates the organizational life cycle using a dual focus of family business and new ventures within established organizations. Topics include start-up considerations, organizational form, cash flow and financing, family dynamics, and identifying appropriate ventures for enhanced organizational growth. Ownership succession and exit strategies are also discussed. *Prerequisites:* advanced business standing and junior standing.

**4560. Entrepreneurial Accounting and Finance. 3.** Expand business knowledge by focusing attention on accounting and finance concerns that are vital to new ventures. Focuses on issues that must be addressed to assist these businesses in meeting their objectives of

growth, preparation for a public offering, and exit strategies. *Prerequisites:* ACCT 1010, FIN 3250, MGT 3210.

**4600. Advanced Internship in Business. 1-4.** Provides students with practical business knowledge, policy, procedure, and decision making. Students work as interns in operating organizations. *Prerequisites:* MKT 3210, MGT 3210, FIN 3250, ACCT 1020, Advanced Business standing, written consent of instructor.

**4800. Business Strategy and Policy. 3.** A capstone course designed to integrate prior courses into a general manager's overall organization perspective. Coverage will emphasize strategic management models which provide frameworks that assist in this task and integrate those internal organization factors with the firm's environment. *Prerequisites:* ACCT 1010, 1020, MGT 1040, DSCI 3210, FIN 3250, MGT 3210, MKT 3210, STAT 2010, advanced business standing, and senior standing.

**4900. Problems in Management. 1-4 (Max. 4).** Studies, on an individual basis, any phase of management not included in the organized course. Written report required. *Prerequisites:* senior standing, advanced business standing, and written consent of instructor.

**4910. Selected Topics in Management. 3 (Max. 6 seniors; M.S. and Ph.D. 9).** A course for advanced students treating contemporary problems in management and administration. Specific area(s) to be considered in a given semester will be printed in the class schedule. *Prerequisites:* junior standing and other courses, as appropriate, for specific area/topic being covered. Obtain permission and specific listing of prerequisites for enrollment from the College of Business Academic Advising Office before registering.

**5600. Graduate Internship in Business. 1-4 (Max. 6).** Provides student with practical business knowledge, policy, procedure and decision making. Student works as intern in operating organization. *Prerequisite:* 12 hours of graduate preparatory courses and consent of instructor; accepted in a graduate program.

**5890. Advanced Problems in Management. 1-8 (Max. 8).** An arrangement whereby a student is permitted to develop some advanced phase of management not offered in the formally structured courses, or to investigate a management problem. A written report is required. *Prerequisite:* 9 hours in management including one 5000-level course, accepted in a graduate program and consent of instructor.

**5920. Continuing Registration: On Campus. 1-2.** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2.** *Prerequisite:* advanced degree candidacy.

## Marketing

Marketing is a societal process and a set of organizational functions for creating, communicating, and delivering value to customers and for managing relationships in ways to benefit local and global stakeholders. Marketing majors are employed in a wide variety of industries and governmental agencies where understanding and managing customer relationships are critical. Students find jobs in market research, advertising, public relations, professional selling, non-profit marketing, product management, retailing, and brand management.

Marketing courses are designed so that students gain an understanding of how to gather, manage, and use information; how to analyze customers; and how to develop marketing strategy and design a marketing mix. At the same time, students gain skills in ethical decision-making, developing creative solutions to solve problems, communicating effectively, and working in teams. They also learn how to form intelligent judgments and opinions relating to economic, social, and environmental factors which vitally affect every day living for both present and future generations.

Students may choose among 3 concentrations (12 credit hours) in the marketing major.

### Sustainability and Global Markets

The Sustainability and Global Markets concentration prepares students to manage marketing activities sustainably within the global context. This concentration assists students in preparing for the challenges of conducting business in a sustainable way, meeting current needs while safeguarding the needs of future generations. Through a global lens, students gain understanding of doing business internationally, considering the cultural, political, legal, economic, technological, and natural environment differences that increase the complexity of marketing functions. Sustainable business practices are innovative strategic and tactical actions that seek to improve balanced economic, environmental, and social outcomes for organizations and stakeholders in both the long and short term. Students are prepared for work in for-profit businesses, non-profit organizations, or in government.

### Customer Experience Management

The Customer Experience Management concentration prepares students to manage marketing activities in for-profit businesses, non-profit organizations, or in government. Students will gain a broad skill set in the marketing field. Through careful selection of electives, students can also tailor this concentration to focus in areas such as market research, sales, integrated marketing communication or advertising, public relations, or product management. This versatile concentration will build students' skills in researching and understanding consumer behavior, indentifying attractive target markets, developing effective marketing strategies, and evaluating an organization's marketing program.

### Supply Chain

The Supply Chain concentration involves the planning, control, and coordination of materials and services from raw materials to customers. Increasing competitiveness through quality, cost, responsiveness, and innovation is essential to supply chain and company success. It is critical to manage processes across boundaries in the firm and across firms that make up the supply chain. Course work will prepare students for managerial positions in the manufacturing and service industries in areas of purchasing, operations, logistics, and customer service.

*Hrs.*

**Marketing core ..... 12**

A complete curriculum sheet is available from the College of Business Academic Advising Office.

### Doctoral Program

*Doctor of Philosophy in Marketing*

The Department of Management and Marketing offers a program leading to a Doctor of Philosophy in Marketing, with an emphasis in sustainability. The program of study draws from extant marketing theory, primarily in consumer behavior, combined with studies in the basic sciences (e.g., anthropology, psychology, sociology) and other applied sciences (e.g., environmental sciences) to create a base of knowledge acceptable for marketing scholarship in higher education, and a depth of knowledge conducive to a stream of publishable research in a specific topic area. Theoretical development is supplemented with course work in the gathering and analysis of qualitative and quantitative data, which prepares the student for rigorous exploration of marketing phenomena related to sustainable business and consumption. Students are

required to complete 72 semester hours and a scholarly dissertation that contributes to the knowledge foundations in marketing and contributes to the basic sciences that informed the inquiry. Semester hours will include core marketing classes, outside elective courses in statistics, basic social sciences, and/or interdisciplinary studies in environmental and natural resources, and dissertation work. First and second year research projects are also required, aimed at the student having published articles in respected marketing and social science journals before program completion. Comprehensive exam is completed at the end of the fourth semester. A teaching component is also incorporated into the curriculum. The program is designed to give students a strong research background and intensive teaching experience.

## Marketing (MKT)

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB↔Q]).**

**3110 [4610]. Marketing Ethics. 3.** Examines ethics and social responsibility in marketing. With some grounding in moral reasoning, students explore application of ethical frameworks to various aspects of marketing, including marketing research, target market selection, and marketing mix decisions. Integrative models for incorporating ethics and social responsibility into marketing decision making are applied. *Prerequisite:* MKT 3210.

**3210. Introduction to Marketing. 3.** An investigation of the marketing discipline with emphasis on vocabulary; principles; functional interrelationships; marketing strategies, practices and problems in national and international environments. *Prerequisite:* sophomore standing and completion of COM1.

**4210. Sales Management and Professional Selling. 3.** Concerns the process of professional selling; planning and presentation; approach; interview and closing; and analysis of the management function of administering to an operating sales force. *Prerequisites:* MKT 3210 and advanced business standing.

**4230. Integrated Marketing Communication. 3.** Introduction to integrated marketing communication, the coordination of an organization's advertising and promotional efforts. Emphasis on how marketing communication is used by organizations to further their marketing objectives. Among the tools available to the integration process are advertising, sales promotion, personal selling, sponsorship marketing, and public relations. *Prerequisites:* MKT 3210, advanced business standing.

**4240. Consumer Behavior. 3.** A study of the dimensions of the consumer market and decision-making processes of consumers through analyzing economic, personal, social and situational influences on the consumer market and on buying behavior. *Prerequisites:* MKT 3210, STAT 2010 and advanced business standing.

**4430. Marketing Management. 3.** Analysis of policy-making and operating decisions of the marketing manager and the tools available to aid in solving marketing problems. *Prerequisites:* MKT 3210, MGT 3210, STAT 2010.

**4440. Marketing of Services. 3.** Service organizations require a distinctive approach to marketing strategy, both in its development and execution. This course builds on marketing concepts for application in service industry settings and examines the role of employees in service delivery, customer satisfaction, and service recovery. *Prerequisite:* MKT 3210.

**4450. Advanced Marketing Management. 3. [(none)◀▶COM3]** Capstone course for marketing majors and minors designed to integrate prior marketing courses. Primary focus is on utilizing marketing concepts and tools in a strategic marketing decision-making context. *Prerequisites:* MKT 4240, MKT 4520, advanced business standing, to be taken in senior year.

**4520. Marketing Research and Analysis. 3.** Investigation of the systematic procedures and tools of research available to the marketing researcher, including a survey of contemporary practices. *Prerequisites:* MKT 3210, STAT 2010 and advanced business standing.

**4540. International Marketing. 3.** Approaches the topic of international marketing from a managerial perspective. Exposure to world environmental characteristics and interdependencies, as well as objectives, strategies and tactics of marketing goods and services to various countries and cultures. Cross listed with INST 4540. *Prerequisite:* MKT 3210 and junior standing.

**4590. Sustainable Business Practices. 3.** A close look at what is happening in business practice today through the 'lens' of sustainability. Business models and systems will be discussed and a framework proposed for assessing the ways in which principles of sustainability may be embedded within corporate strategy. Cross listed with INST 4590; dual listed with MKT 5590. *Prerequisites:* advanced business standing.

**4600. Campus Sustainability. 3.** Uses campus as a setting to explore long-term environmental, economic, and social sustainability theory and practice. Students design and implement a semester-long project to improve sustainability of the UW campus. Interdis-

ciplinary and appropriate for students of all disciplines. Dual listed with MKT 5600; cross listed with ENR 4600. *Prerequisite:* advanced business standing for COB majors, junior standing for non-COB majors.

**4900 Problems in Marketing. 1-4 (Max. 4).** Studies, on an individual basis, any phase of marketing not included in the organized courses. A written report is required. *Prerequisites:* advanced marketing courses as appropriate, advanced business standing; requires written consent of instructor.

**4910. Selected Topics in Marketing. 3.** A course for advanced students treating contemporary problems in marketing related areas. Specific area(s) to be considered in a given semester will be printed in class schedule. *Prerequisites:* junior standing and other courses, as appropriate, for specific area/topic being covered. Obtain permission and specific listing of prerequisites for enrollment from the College of Business Academic Advising Office before registering.

**5590. Sustainable Business Practices. 3.** A close look at what is happening in business practice today through the lens of sustainability. Business models and systems will be discussed and a framework proposed for assessing the ways in which principles of sustainability may be embedded within corporate strategy. Cross listed with INST 5590; dual listed with MKT 4590. *Prerequisite:* advanced business standing.

**5600. Campus Sustainability. 3.** Uses campus as a setting to explore long-term environmental, economic, and social sustainability theory and practice. Students design and implement a semester-long project to improve sustainability of the UW campus. Interdisciplinary and appropriate for students of all disciplines. Dual listed with MKT 4600; cross listed with ENR 5600. *Prerequisite:* advanced business standing for COB majors, junior standing for non-COB majors.

**5890. Advanced Problems in Marketing. 1-8 (Max. 8).** An arrangement whereby a student is permitted to develop some advanced phase of marketing not offered in formally structured courses, or to investigate a marketing problem. A written report is required. *Prerequisite:* 9 hours in marketing including one 5000-level course, written consent of instructor, accepted in a graduate program.

**5920. Continuing Registration: On Campus. 1-2 (Max. 12).**

**5940. Continuing Registration: Off Campus. 1-2 (Max. 12).**

**5980. Dissertation Research. 1-12 (Max. 42).** Designed for students who are involved in research for their dissertation project. Also

used for students whose coursework is complete and are writing their dissertation. *Prerequisites:* enrolled in a graduate degree program.

## Master of Business Administration (MBAM)

### Program Overview

The UW MBA Program delivers professional management education that connects principles, concepts, and intense case analysis with real world experience as tools for making business decisions. Students will develop leadership and managerial skills. UW MBAs will possess the education and training to compete in today's rapidly changing global business world.

Class sizes are small and diverse with respect to age, gender, experience, and nationality. Courses are taught by a select group of business faculty members. The total program experience (both inside and outside the classroom) is designed to provide exceptional learning along with life-long relationships.

### Admission Requirements

A Faculty Admissions Committee, chaired by the Director of the MBA program, will review all applications. Application to the program is open to students who have a four-year baccalaureate degree from an accredited university or college. Students with a baccalaureate degree in a business discipline or business administration are eligible for the program, but will not be allowed to waive any of the core courses.

Applicants must provide official academic transcripts, GMAT or GRE test results, three letters of recommendation, and a current resume.

Students whose native language is not English must submit TOEFL results. There are no exceptions for students from other UW colleges and schools seeking dual degrees. Please be advised that our program includes significant class discussion, substantial daily reading, many written assignments, and presentations.

### Attainment of minimum requirements does not guarantee admission

- Bachelor's degree from an accredited university or college
- Undergraduate GPA greater than 3.0, preferred
- GMAT or GRE exam scores
- Letters of recommendation

- Resume
- Participate in an interview, either on-campus (preferred) or by telephone (the MBA Programs office will call international applicants)
- Official transcripts from each institution attended. Transcripts should be sent directly to the MBA Program Office.

### Additional International Student Admission Requirements:

- Sufficient financial resources as established by the University of Wyoming.
- A minimum TOEFL score of 100 on the Internet-based exam. TOEFL scores are valid for two years.

### Degree Requirements

- 47 credit hours of graduate credit (38 hours of required Core MBA courses plus 9 hours of track courses), including participation in all MBA program activities (Orientation, MBA Executive Leadership Program, Personal Development, NOLS Leadership Program, etc.)
- This is a cohort based program. The course sequence is highly-structured and all course requirements must be completed in their prescribed manner. Course sequence is subject to change, in extremely rare circumstances, at the discretion of the MBA Director.
- Maintain good academic standing and receive no more than one "C".

### Course of Study

*(sequence subject to change only at the direction of the MBA Program Director)*

#### Pre-Term 1

Students participate in an orientation and may receive pre-work from the Fall 1 Core faculty.

#### Fall 1: MBA Core (16 credit hours)

- Financial Accounting
- Business Research Methods
- Decision Making
- Organization Behavior/ Human Resources
- Decision Modeling
- Professional Development I
- Managerial Economics I

#### Spring 1: MBA Core (16 credit hours)

- Managerial Accounting
- Financial Management
- Marketing Management
- Entrepreneurial Management

- Operations Management
- Professional Development II
- Managerial Economics II

#### Summer: MBA Core (3 credit hours)

- Experiential Learning Project (May – July)

#### Pre-Term 2

Students will participate in a 5-8 day outdoor program building leadership and team skills.

#### Fall 2: Core (3 credits)

- Sustainable Management Strategy (Capstone)

#### Fall 2: Track Courses (9 credits) - General Management or Energy Management

#### Dual Degree Programs

The following dual degree programs are available:

- MS in Engineering / MBA
- Pharm. D. /MBA
- J.D. / MBA
- International MBA

Students will need to be admitted to both degree programs. The MBA Core courses are required of all students, including the Capstone course. At the completion of all graduate studies, students will receive two degrees.

Students interested in a dual degree should refer to the MBA website for degree-specific application requirements.

Energy Management Major (59 credit hours) - Designation will appear on MBA Degree

- MBA Core (38 credit hours) - Fall 1, Spring 1, Summer Experiential Project, and Fall 2 Capstone
- Energy Courses (21 credits)
  - o Fund Accounting Energy Industry
  - o Energy Finance: Project Evaluation
  - o Supply Chain Mgmt Energy Ind
  - o Energy Economics and Public Policy
  - o Energy Law and Regulation
  - o Energy Finance: Energy Trading, Hedging and Securities
  - o Marketing and Sustainable Consumption

### Additional Information

#### Tuition & Fees

Tuition and fee charges will include program events/activities. Textbooks are not included.

### MBA Executive Leadership Program

Students participate in weekly meetings (primarily on Fridays) with business leaders from a wide variety of industries (for profit and tax exempt) and political leaders. The program takes place mostly on campus, but does include some travel. This program supplements the class work, provides discussion and learnings of business challenges, opens the students' horizons on career opportunities, and provides long-term networking opportunities.

### Experiential Learning Project

The required summer experiential learning project will give students the opportunity to address real-world strategic issues for business, government, and non-profit entities. The project will be administered from the UW campus and students will have access to COB facilities to perform analyses, develop recommendations, and prepare a written and oral presentation to management. Students will travel to company sites and other locations for data collection and interviews, as appropriate. College faculty will participate in these projects as mentors. Students cannot take any other courses during the summer experiential project.

### Track Courses

Nine credit hours of coursework determined by the student's track. Courses for dual degree students will be determined by both departments.

### Online MBA Program

Students enrolled in the General or Energy MBA Programs may not apply credits from the Online MBA Program (courses with a MBAX prefix) to their degree, and vice versa.

### Academic Requirements

Students must maintain a cumulative GPA of 3.0 in the MBA program to remain in "good standing". If a student's GPA falls below 3.0, he or she is automatically placed on academic probation; the student must raise their cumulative GPA to 3.0 the following semester to avoid dismissal from the program. Other requirements involving program dismissal include:

- A student who earns a grade lower than a "C" in any course is dismissed from the program
- A student earning more than one "C" will be dismissed from the program
- A student failing the Comprehensive exam will be dismissed from the program

## Master of Business Administration (MBAM)

### 5102. MBA Operations Management. 3.

Production and operations management. Topics include operations strategy, quality management, facilities location, facilities layout, forecasting, inventory management, production planning, and scheduling. *Prerequisite:* Admission to the MBAM program.

**5103. Research Methods. 3.** Introduce the characteristics and various approaches to designing and conducting qualitative research projects in business research. Gain hands-on experience in various qualitative methods and analysis techniques. Skills covered are applicable to business problems encountered in both consumer and business-to-business markets, and public and private sectors. *Prerequisite:* Admission to the MBAM program.

**5104. Organization Behavior and Human Resource Management. 3.** Enables students to recognize psychological phenomena influencing individual, group & organizational behavior and helps them understand different HRM functions and how HRM fits within the overall organization's strategy. *Prerequisite:* Admission to the MBAM program.

**5106. Professional Development I. 0.** First course is a sequence of courses focused on professional development. This course will provide "a real world" format where students must express their ideas in every class through verbal presentations, as well as developing written products such as handouts, PowerPoint presentations, white papers and email correspondence. *Prerequisite:* Admission to the MBAM program.

**5107. Decision Making. 3.** Overview of (i) business decision making within (ii) its competitive, economic, legal, ethical and organizational contexts. *Prerequisite:* Admission to the MBAM program.

**5108. MBA Financial Accounting. 3.** Provide you with the necessary tools to read, understand, and use information that emanates from the accounting system within most organizations. *Prerequisite:* Admission to the MBAM program.

**5202. Decision Modeling. 3.** A graduate course in decision modeling. Topics include linear programming, optimization modeling, and monte carlo simulation modeling. *Prerequisite:* Admission to the MBAM program.

**5203. Entrepreneurial Management. 3.** Explores organizations – theories and practical applications of those theories concerning how organizations operate strategically, i.e. in relation to the external environment. *Prerequisite:* Admission to the MBAM program.

**5204. Financial Management. 3.** Provide an in-depth understanding of the job of a financial manager in a corporate setting. Exposure to other aspects of finance in the economy, such as capital markets and investments. *Prerequisite:* Admission to the MBAM program.

**5206. Professional Development II. 0.** Second part of a sequence of courses designed to help students advance their professional skills (written, oral, and interpersonal) and achieve success in career planning, career preparation, and career development. *Prerequisite:* Admission to the MBAM program.

**5207. Marketing Management. 3.** Provide an in-depth understanding of marketing management. Marketing managers are responsible for co-creating customer value for a sustained competitive advantage. *Prerequisite:* Admission to the MBAM program.

**5208. MBA Managerial Accounting. 3.** Use of accounting information for internal decision making purposes. *Prerequisite:* Admission to the MBAM program.

**5301. MBA Summer Project. 3.** Serves as an externship for individual MBA students or MBA teams to work with a client on a business issue under the supervision of a qualified faculty member in the College of Business. *Prerequisite:* Completion of the first-year (Fall & Spring semester) on campus MBA courses.

**5303. International Business. 3.** Focus on the topics of culture, effects of the macro-environment on business, and regional economic integration, with predominant themes of leadership and sustainability in business. *Prerequisite:* Admission to the MBAM program.

**5304. MBA Business Law. 3.** Broad perspective of the various legal issues associated with managing a business enterprise. *Prerequisite:* Admission to the MBAM program.

**5305. Sustainable Management Strategy (Capstone). 3.** Presents general principles of sustainable strategic management, relying heavily on case analysis. Course material will be managerially relevant, with an analytical and decision-oriented approach. *Prerequisite:* Successful completion of Fall 1, Spring MBAM semesters and a B or better in MBAM 5301.

**5309. MBA Managerial Economic I. 1.** Discuss a variety of tools and concepts intended to give you the background in economics and decision-making you will need to be an effective manager in a world where economic circumstances are uncertain and changing constantly. *Prerequisite:* Admission to the MBAM program.

**5311. MBA Managerial Economics II. 1.** Continue discussion of a variety of tools and concepts intended to give you the background in economics and decision-making you will

need to be an effective manager in a world where economic circumstances are uncertain and changing constantly. *Prerequisites:* Admission to the MBAM program, completion of MBAM 5309.

**5501. Energy Economics and Policy. 3.** Applies the tools of economic analysis to attain and understanding of energy markets and energy policy analysis. Sec. 1 Overviews the major energy and environmental policy issues facing the United States and the world. Sec 2 Determinants of energy demand. Sec. 3 Technologies and costs to produce and deliver energy. Sec. 4 Determinants of energy price. *Prerequisite:* Permission of MBA Program Director, or student's graduate program coordinator in consultation with MBA Program Director.

**5502. Energy Finance: Project Evaluation. 3.** Introduction (i) to traditional engineering cost methods to evaluate investments in energy and mineral projects and (ii) to modern techniques to make these decisions under uncertainty given the technical and economic risk facing minerals industries. *Prerequisite:* Permission of MBA Program Director.

**5503. Fundamentals of Accounting in the Energy Industry. 3.** Introduces students to basic financial accounting and reporting issues related to energy producing activities. Specifically, the course will investigate current accounting practices of energy producing companies related to exploration, acquisition, development, and delivery of energy products. The course will also cover financial requirements of the Financial Accounting Standards Board (FASB), the International Accounting Standards Board (IASB), and the Securities and Exchange Commission (SEC). Cross listed with ACCT 5503. *Prerequisite:* Permission of MBA Program Director, or student's graduate program coordinator in consultation with MBA Program Director.

**5504. Supply Chain Management in the Energy Industry. 3.** Examines the field of supply chain management in an energy context. Study procurement and distribution strategies, concepts, tools and techniques that support energy operations. Course activities and case studies will address effective execution of these strategies and the appropriate supporting activities. *Prerequisite:* Permission of MBA Program Director, or student's graduate program coordinator in consultation with MBA Program Director.

**5506. Energy Finance: Securities, Hedging, and Trading. 3.** Overview of security analysis applied to energy firms, hedging strategies, and trading activities in energy markets. Trading activities covered include the use of

forward and futures contracts, swaps, options, and related derivatives. *Prerequisite:* Permission of MBA Program Director.

**5507. Energy Business Strategy (Capstone).**

**3.** Improving an organization's competitiveness in changing global energy environments. Includes an overview of the geopolitics of global energy, and the risks involved. Emphasizes skill-development for formulating and implementing business-level, corporate, and global strategies in dynamic environments. *Prerequisite:* Permission of MBA Program Director, or student's graduate program coordinator in consultation with MBA Program Director.

**5508. Marketing and Sustainable Consumption. 3.** Focuses on understanding household and business energy consumption. Emphasizes the environmental, economic, social and psychological influences on consumer decision making and sustainable consumption. Course deals with developing customer value propositions, and for marketing strategy development in branding, product-line offerings, pricing, retailing and distribution, and public policy. *Prerequisite:* Permission of MBA Program Director, or student's graduate program coordinator in consultation with MBA Program Director.

**5800. MBA Topics. 1-3.** A course for MBA students treating contemporary problems in business related areas. Specific area(s) to be considered in a given semester will be printed in class schedule. *Prerequisite:* Admission to the MBAM program.

## Online Master of Business Administration (MBAX)

MBA Programs Office

1000 E. University Ave., Dept. 3275

Laramie, WY 82071

Phone: (307)766-2449

Email: mba@uwyo.edu

Web site: www.business.uwyo.edu/mba

The University of Wyoming offers a part-time Online MBA (EMBA). The EMBA Program is specifically designed for experienced business professionals interested in an AACSB accredited, 100% online program that fits their busy schedules. This two-year program is for professionals interested in enhancing their understanding of business disciplines and applying them to making decisions. Beginning each fall, the cohort-based program consists of 30 credit hours of coursework.

## Program Admission Requirements

A Faculty Admissions Committee, chaired by the Director of the MBA Program, will review all applications. Admission to the Online MBA program is competitive, and only top candidates will be considered. (These requirements represent minimum applicant qualifications.) The committee will review all admission documents to determine if the applicant can successfully complete the program. The EMBA admission requirements include:

- Bachelor's degree from an accredited university or college; undergraduate GPA may be a consideration for admission.
- Five or more years of progressive, full-time professional work experience including three or more years in a supervisory/managerial role
- GMAT score of 550 or better\* (GRE may substitute for GMAT)
- Three letters of recommendation, preferably from superiors or business professionals
- Professional resume
- Quantitative skills: candidates whose backgrounds do not demonstrate proficiency in basic quantitative and analytic skills may be required to take a quantitative skills assessment test or receive a 'B' or better in any required prerequisite courses prior to admission.
- Official transcripts from all institutions attended sent directly to the MBA Office. The MBA Program Office will perform a transcript analysis once all transcripts are received in order to determine if the applicant has fulfilled all prerequisites.
- Interview: Pre-admission interviews are encouraged and may be conducted prior to submission of a completed application. Candidates can request an interview by sending a copy of their resume to the Admissions Office at mba@uwyo.edu.

**\*Note: Prerequisite coursework and the GMAT/GRE may be waived based on experience at the discretion of the MBA Program Director. Please contact the MBA Program Office for transcript analysis and resume evaluation prior to beginning any prerequisite course work or taking the GMAT/GRE exam.**

**Important: Attainment of these requirements does not guarantee admission.**

## Prerequisite Courses

Prerequisite coursework may be waived based on experience at the discretion of the MBA Program Director. Please contact the MBA Program office for transcript analysis and resume evaluation prior to beginning any prerequisite course work.

- **MGT 3210:** Management and Organization.
- **MKT 3210:** Introduction to Marketing.
- **FIN 3250:** Managerial Finance.
- **ECON 4030:** Managerial Economics.
- **DSCI 3210:** Production and Operations Management.

All prerequisite courses are offered online through the University of Wyoming Outreach School. For information on what semester these courses are offered, contact the MBA Program Office. An equivalent course that is pre-approved by the MBA Programs Office may be completed at a regionally, and preferably AACSB International, accredited institution.

## Online Master of Business Administration (MBAX)

**5108. MBA Financial Accounting. 3.** Provide you with the necessary tools to read, understand, and use information that emanates from the accounting system within most organizations. *Prerequisite:* Admission to the MBA online program.

**5208. MBA Managerial Accounting. 3.** Turn our attention to the use of accounting information for internal decision making purposes. *Prerequisite:* Admission to the MBA online program.

**5151. New Ventures. 3.** Explores and evaluates various intrapreneurial and entrepreneurial opportunities, including business plans. Also considers the dynamic business environment characterized by technology diversity and global enterprise. Students analyze a business opportunity and make a presentation to potential investors. *Prerequisite:* admission into MBAX program.

**5200. Business Research Methods. 3.** Provides methods and applications of business research. Quantitative data analysis and interpretation. SPSS is the primary software applied. *Prerequisite:* admission into MBAX program.

**5225. Decision Science Modeling for Managers. 3.** Students study selected computer-based models for solving problems in the areas of operations, finance and marketing. Tools include mathematical programming, Monte Carlo simulation and project management networks. Based on Excel and its tools and covers some of the models necessary to develop and manage successful supply chains. *Prerequisite:* admission into MBAX Program.

**5235. Marketing Analysis and Strategy. 3.** Understanding market orientation and the strategic marketing process is the goal of this course. Uses various tools and secondary data sources to assess current market opportunities/threats. Discusses customer targeting and relationship development, as well as strategic issues of branding, integrated marketing communications, product management, pricing, and distribution in various business exchanges. *Prerequisite:* admission into MBAX Program.

**5300. Organizational Behavior & Human Resource Mgmt 3.** Enables students to recognize psychological phenomena influencing individual, group & organizational behavior and helps them understand different HRM functions and how HRM fits within the overall organization's strategy. *Prerequisite:* admission into MBAX Program.

**5320. Operational Budgeting and Financial Statement Analysis. 3.** Overview of basic concepts for operation/financial planning/budgeting. Financial statements and analytical techniques help determine a firm's strengths/weaknesses. Concerned with the coordination of business activities to achieve strategic objectives. Topics: performance models, balanced scorecard reporting, concepts in efficiency and effectiveness, and financial/non-financial performance measures. *Prerequisite:* admission into Executive MBA Program.

**5330. The Global Business Environment. 1.5.** Introduction to global macroeconomics and the environment in which global business takes place. Focuses on interest and exchange rates; business cycles; fiscal and monetary policy; budget and trade balances; international organizations central to the functioning of the global economy; and global legal and ethical issues. *Prerequisite:* admission into executive MBA Program.

**5331. International Business Practices. 1.5.** Introduces students to various aspects of international business. Areas covered include international business activity, theory, and organizations and the effects of culture on the customer and organizational environments, product and information flows, management for demand creation and fulfillment, the international monetary system, and other business functions. *Prerequisite:* admission into MBAX Program, MBAX 5330.

**5345. Strategic Management in Dynamic Environments. 3.** Helps students develop the skills for formulating and implementing business-level, corporate, and global strategies in dynamic environments. Students master analytical and integrative tools to perform in-depth analyses of industries, firms, and competitors, predict competitive behavior, and develop and implement strategies to achieve and sustain competitive advantage. *Prerequisite:* admission into MBAX Program.

**5350. Marketing, Markets, and Society. 3.** Introduction to the interplay between marketing, markets and society. Issues and controversies for business persons are discussed in an online environment; these are analyzed and synthesized. Developing a wide, long, and integrative viewpoint for forming plans and actions are a principle objective. *Prerequisite:* admission to EMBA program.

**5400. Enterprise Information Systems. 3.** Employs various formats to examine the relationship between an organization's resources, events, and agents to create databases that form the centerpiece of ERP systems. Topics include enterprise system integration, representation, and patterns, value system and value chain modeling, information retrieval implementation, and controls. *Prerequisite:* admission into MBAX Program.

**5510. Financial Management. 3.** Studies of environmental influences on corporate financial decision-making and measurement devices useful in corporate financial management. Cross listed with FIN 5510 and MBAM 5510. *Prerequisite:* admission into MBAX Program.

The College of Education prepares teachers, counselors, administrators and other service personnel for positions in public education in Wyoming, throughout the nation, and the world. The teacher education program incorporates content area courses from the various colleges on campus with experiences in educational methodology. Programs are designed to provide students with a maximum amount of experience in the classroom.

Graduates of the College of Education are prepared to deal with youth growing up in a rapidly changing world. Programs are experiential, collaborative, outcomes based, and technologically supported. Emphasis is placed on professional ethics, a commitment to lifelong learning, and respect for all individuals in our culturally diverse society.

## Programs of Study Undergraduate Degrees

### Bachelor of Science

- Agricultural education
- Technical education (UW-Casper only)

### Bachelor of Arts

- Elementary education
- Secondary education

## Graduate Degrees

### Master of Science

### Master of Science in Counseling

### Master of Arts

### Doctor of Philosophy

### Doctor of Education

### Doctor of Counselor Education and Supervision

## Accreditation

The College of Education, a member of the American Association of Colleges of Teacher Education, is accredited by the National Council for Accreditation of Teacher Education. The Wyoming Professional Teaching Standards Board and the North Central Association of Colleges and Schools approve the college as an accredited teacher-preparing institution.

The Counseling programs are fully accredited by the Council for Accreditation of Counseling and Related Educational Programs Board.

## Organization of the College

The College of Education includes undergraduate teacher education and graduate studies in education. Departments offering undergraduate and graduate programs in the college include Professional Studies, Educational Studies, Elementary & Early Childhood Education, and Secondary Education.

Undergraduate and graduate education are supported by several units. The Office of Teacher Education, McWhinnie Hall room 100, coordinates activities dealing with undergraduate academic advising, field experiences, and certification.

The Counselor Education Training Clinic provides counseling services to students, staff, faculty of the university, as well as the community at-large.

The College of Education, College of Arts and Sciences, Wyoming community colleges, many Wyoming districts, and the State Department of Education are part of the Wyoming School-University Partnership, which grounds collaborative efforts across the state related to K-12 preservice and inservice education.

The Laboratory School, an Albany County School District entity, serves the college, the university, the school district, and the state as an educational center for research, development, instructional advancement, and inservice education. The school enrolls students in pre-school through ninth grade.

Computer laboratories in the college feature a wide range of capabilities including Internet access. The laboratory equipment is frequently updated to serve the needs of students, faculty and staff.

The Learning Resource Center is a branch of the university library system. Educational materials are available to serve the needs of K-12 students, university students, university faculty and public school faculty in Wyoming.

## Wyoming Teacher Education Program

The Wyoming Teacher Education Program consists of increasingly demanding phases of professional preparation. Competencies based on professional standards, including those mandated by the Wyoming Professional Teaching Standards Board (PTSB), are addressed developmentally. A teacher candidate gradu-

ating from this program will have mastered competencies required by the PTSB and the education profession.

Freshman year (Preprofessional): Students concentrate on the University Studies Program requirements. EDST 2450, Foundations of Development and Learning, must be completed prior to moving into Phase I.

Phase I: Sophomore students are introduced to teaching and learning through EDST 2480, Diversity and the Politics of Schooling. This course includes a field experience in a public school setting.

Phase II: A junior-level experience extends student competence through EDST 3000, Teacher as Practitioner. The practicum experience is in a public school guided by practicing K-12 faculty.

Phase IIIa/b: A two-semester sequence in the final year consists of fieldwork and pedagogy course work in the first semester. The second semester consists of a 16-week, full-time classroom experience. Field experiences are completed in Partner Schools.

Partner Schools are regional Wyoming district settings with collaborative agreements for concentrated field placements. These partnerships are focused on interactive mentoring by university and K-12 faculty and emphasize applied pedagogy.

## Admission to the Wyoming Teacher Education Program

Effective fall semester 2013, new first-time students who meet the University of Wyoming's standards for admission may declare their major in Elementary Education, Secondary Education in a specific content area, or Education Undecided (EDUD), provided that they have a minimum ACT Composite score of 21 and an ACT Math score of 21. A lower ACT Math score can be replaced by a Math Placement Examination (MPE) score of 2 or higher. Education Undecided majors should decide on a specific content area no later than the first semester of their sophomore year.

All incoming students pursuing teacher certification and/or teacher endorsement programs must undergo an initial criminal background check prior to full admission to the College of Education. Any costs associated with the background checks will be the students' responsibility. Specific information



regarding this process can be found at: <http://www.uwyo.edu/ted/background-checks/index.html>). A second background check is included as part of the state application process for the Wyoming Substitute Teaching Permit, which is required for admission to Phase II and Phase III of the Wyoming Teacher Education Program.

For those students who do not meet the above admissions requirements, it is suggested that they major in general undeclared (UNDC) so that they will receive more appropriate advising and access to support services through the Center for Advising and Career Services until they have attained a minimum 2.75 UW grade point average (with at least 15 UW credits), and successfully complete an approved background check.

Current UW students wishing to change their major to Education but do not yet have a UW grade point average must wait until they meet the requirement of a minimum 2.75 UW grade point average, with at least 15 UW credits posted to their transcript. It is recommended that they complete a Change of Major form and contact the Office of Teacher Education in McWhinnie Hall, room 100 to initiate the background check process. Students' progression through the Education curriculum could be delayed until all requirements are fulfilled and their major officially changed to Education.

Transfer students from out of state institutions, as well as from Wyoming community colleges wishing to declare a major in Education must have completed a minimum of 15 transferable credits, including the USP 2003 "QA" or USP 2015 "Q" requirement (as determined by the UW Registrar) to do so. Transfer students must have a minimum Transfer GPA of at least 2.75 and successfully complete an approved background check.

For transfer students not meeting these requirements, it is suggested that they major in general undeclared (UNDC) so that they will receive more appropriate advising and access to support services through the Center for Advising and Career Services until they meet requirement of a minimum 2.75 UW grade point average (with at least 15 UW credits), and successfully complete an approved background check.

Re-admitted students who return to UW after two or more semesters away, and wish to (re-)declare a major in Education, must have a minimum 2.75 UW GPA (with at least 15 UW credits) to do so and successfully complete an approved background check.

Second Bachelor's (SBA) / Post-baccalaureate teacher certification program students must have a cumulative GPA of 2.75 or higher from UW or from another accredited college or university, in order to declare a major in Education. A valid Wyoming Substitute Teaching Permit will be required, which will also serve as an approved background check.

**Academic Advising**

Students are assigned an academic adviser who will assist in planning a program combining University Studies requirements, core content requirements, and professional education courses. Students are expected to consult with their adviser regularly. The Office of Teacher Education coordinates advising and provides students and faculty with assistance in areas related to academic advising.

**Degree Program Curricula**

The following curricula summarize the programs offered by the College of Education. Students complete content courses in their major as well as professional education courses, some of which can also be counted toward their University Studies Program requirements. The University Studies Program requirements include:

Communication I (COM1).....3  
 Communication II (COM2) .....3  
 Communication III (COM3).....3  
 First-Year Seminar (FYS).....3  
 Human Culture (H) .....6  
 Physical and Natural World (PN).....6  
 Quantitative Reasoning (Q) .....3  
 U.S. & Wyoming Constitutions (V).....3

The minimum total credit hours required to complete a degree in Education varies by program. Of the minimum credit hours required to complete a program, 42 credit hours must be completed at the upper division level (3000-level or higher), with 30 of those credits being completed at UW. Additional College of Education requirements are:

1. 2.75 UW Total Institution grade point average
2. ITEC 2360, Teaching with Technology
3. 2.50 grade point average in the content courses required for each specific major
4. A valid Wyoming substitute teaching certificate

Further information on each program is available in:

Office of Teacher Education  
 McWhinnie Hall room 100  
 Dept. 3374, 1000 E. University Ave.  
 Laramie, WY 82071  
 (307) 766-2230.

**Acceptability of Coursework**

Courses taken to satisfy professional education requirements and major content requirements must be taken for a conventional grade (A-F) unless offered for S/U grading only. Please note that grades of C- will not satisfy this requirement.

Professional education courses taken prior to the last 10 years will not be accepted in a degree and/or teacher certification program.

The College of Education does not accept transfer credits for Professional Education or content area courses with equivalents at UW when the grade earned was less than a C. Please note that grades of C- will not satisfy this requirement. The College of Education does not accept either teaching methodology or student teaching coursework or credits completed at other colleges or universities.

**Student Responsibility**

College of Education students are responsible for knowing and meeting graduation requirements. Students are expected to maintain a 2.75 UW Total Institution grade point average to enter Phase II and III of the Wyoming Teacher Education Program and continue in the professional education sequence and to graduate from the teacher education program. Prior to enrolling in professional education courses, students are expected to have met the specific program and course prerequisites as listed in this publication. Students are expected to make reasonable academic progress toward completion of a degree.

**Agricultural Education Curriculum Professional Education Requirements**

EDST 2450.....3  
 ITEC 2360.....3  
 EDEX 2484.....3  
 EDST 2480.....4  
 EDST 3000 .....6  
 EDST 3550.....2  
 EDSE 3278.....3  
 EDSE 4278.....3  
 EDSE 4500.....15

**Agricultural Education with Area of Concentration**

This program consists of a minimum of 126 total hours. Minimum of 2.75 cumulative GPA and minimum of 2.50 content GPA required. This major will be advised in the College of Education, with a secondary adviser in the College of Agriculture and Natural Resources. Refer to the College of Education for specific curriculum requirements.

**Major Content**

AGEC 1010 or 1020 .....	3
AECL 1000.....	4
SOIL 2010.....	4
REWM 2000 .....	3
ANSC 1010 .....	4
ANSC 2020.....	4
PLNT 2025.....	3
EDAG 4170 .....	3
EDAG 4180 .....	3
LIFE 1010 .....	4
CHEM 1000.....	4
LIFE 2022 or 2023.....	4
LIFE 3400 .....	3

**Areas of Concentration (15-16 hours) or Minors - All Ag Ed students are required to either complete courses in an area of concentration below, or complete a minor in the departments of Animal and Veterinary Science, Plant Science, Renewable Resources, Agricultural Communications, or Agricultural and Applied Economics. Minors must be declared and cannot be added after the B.S. degree has been earned. Completing a minor may require additional hours beyond the required 128 credit hours. Your AGNR adviser should be consulted when working on a minor for requirements.**

**Areas of Concentration:**

**Animal and Veterinary Science (ANVS) 16 hrs.**

ANSC 3100.....	3
ANSC 3010.....	4
FDSC 2040.....	3
And, one of the following:	
PATB 4110 or ANSC 4120 or ANSC 4540 or FDSC 3060 .....	3
Upper Division Course (TBA).....	3

**Agroecology (AECL) 15 hrs.**

PLNT 2026.....	1
AECL 3030.....	3
Upper Division Coursework in ENTO, PLNT, SOIL.....	8
Upper Division course (TBA).....	3

**Rangeland Ecology and Watershed Management (REWM) 15 hrs.**

REWM 3020.....	3
REWM 4530.....	1
REWM 4700.....	3
Upper Division Coursework in REWM.....	5
Upper Division course (TBA).....	3

**Soil Science (SOIL) 15 hrs.**

SOIL 4120.....	3
SOIL 4150.....	3
SOIL 4160.....	3
Upper Division course in SOIL.....	3
Upper Division course (TBA).....	3

**Agricultural Communication/Leadership (AGCM) 15 hrs.**

COJO 1040.....	3
COJO 2010.....	3
Upper Division Coursework in COJO or approved Leadership courses .....	6
Upper Division course (determined with advisor).....	3

**Agricultural Business (AGBS) 15 hrs.**

AGEC 1010 or 1020 .....	3
AGEC 4050.....	3
AGEC 4060.....	3
Upper Division course in AGECE.....	3
Upper Division course (determined with advisor).....	3

**Art Education with Concurrent Major in Art Curriculum**

The art education program consists of a minimum of 123 total hours and prepares students for K-12 certification. Transfer students are required to take at least 26 hours of upper-division art course work from the University of Wyoming. Majors must earn a grade of C or better in all content courses. A minimum GPA of 2.50 in major content courses is required.

**Professional Education Requirements**

EDST 2450.....	3
EDST 2480.....	4
EDEX 2484.....	3
ITEC 2360.....	3
EDST 3000 .....	6
EDST 3550.....	2
EDSE 3272.....	3
EDSE 4272.....	3
EDSE 4500.....	8
EDEL 4500.....	8

**Art Foundations Core Requirements**

ART 1005.....	3
ART 1110.....	3
ART 1115.....	1
ART 1120.....	3
ART 1130.....	3

ART 2000 .....	1
ART 2305.....	1

**Art Studio Core**

ART 2005.....	3
ART 2210.....	3
ART 1310 .....	3
ART 2410 or 2420 .....	3

Choose one additional elective course:

ART 2112 .....	3
ART 2255.....	3
ART 2265.....	3
ART 2350.....	3

The above major content courses must be completed before EDSE 4272. In addition to these courses, students must also take 9 hours of upper division studio, 6 hours of art history electives, 3 hours of interrelated art electives, and an A&S Global Awareness course.

**Art History Requirements**

ART 2010.....	3
ART 2020.....	3
Art History Upper Division Electives.....	6

**Upper Division Art Studio Requirements**

ART 3510 .....	3
Upper Division Art Studio electives.....	9

To be selected from the following:

- ART 3005, 3052, 3112, 3120, 3140, 3180, 3210, 3250, 3265, 3310, 3320, 3330, 3345, 3350, 3410, 3420, 3500, 4005, 4050, 4052, 4110, 4120, 4140, 4210, 4250, 4265, 4310, 4330, 4355, 4360, 4400, 4410, 4420, 4430, 4510, 4520, 5430, 5660, 5670

**Elementary Education Curriculum**

**Professional Education Requirements**

This program consists of a minimum of 120 total hours.

EDST 2450.....	3
EDST 2480.....	4
EDEX 2484.....	3
ITEC 2360.....	3
EDST 3000 .....	6
EDST 3550.....	2
EDEL 4109.....	5
EDEL 4309.....	5
EDEL 4409.....	5
EDEL 4500.....	15-16

**Major Content**

EDEL 2280.....	3
EDEC 4320.....	3
MATH 1100 .....	3
EDEL 1410 .....	1
MATH 1105 .....	3
MATH 2120.....	3
EDEL 2410 .....	1
LIFE 1020.....	4
EDEL 1430.....	1
ASTR/GEOL 1070.....	4

EDEL 1450.....1  
 PHYS 1090.....4  
 EDEL 1440.....1  
 HLED 2006.....1  
 GEOG 1000 or 1020.....3

The above major content courses must be taken prior to enrollment in EDEL 4109, 4309, 4409. EDST 3550 must also be completed before EDEL 4109, 4309, 4409.

**Additional Content Courses**

Each of the following areas must be represented in the program. An additional content course may fulfill one University Studies requirement or be part of the area of concentration. No courses may be double counted within these four areas. Courses for speech and acting and American diversity must be selected from lists of designated courses, which are available from the Office of Teacher Education, or the college web site.

American Diversity.....3  
 EDEL 3170.....3  
 Music.....3  
 Speech and acting.....3

*Choose one:* COJO 1010 or 2010, COJO 1030, COJO 1040, THEA 1100, or EDCI 4140

**Areas of Concentration**

Elementary education majors must take a minimum of 18 semester hours in a specific area of concentration. The following approved areas provide specialization in:

1. Creative arts
2. International Education Studies or American Cultural Diversity
3. Environmental studies
4. Interdisciplinary early childhood
5. Individual and society (at UW-Casper only)

A list of required courses and specific requirements for each area of concentration may be obtained from The Office of Teacher Education, or the college web site.

**English Education with Concurrent Major in English Curriculum**

This program consists of a minimum of 120 total hours. All English courses must be passed with a grade of C or better. A minimum GPA of 2.5 in major content courses is required.

**Professional Education Requirements**

EDST 2450.....3  
 EDST 2480.....4  
 EDEX 2484.....3  
 ITEC 2360.....3  
 EDST 3000.....6  
 EDST 3550.....2

EDSE 3270.....3  
 EDSE 4270.....3  
 EDSE 4500.....15

**Major Content**

ENGL 2425, 2430 and 2435.....9  
 ENGL 4110, 4120 or 4170.....3

Two 4000-level courses in pre-20th century literature.....6

(choices available from the Office of Teacher Education or the college web site)

EDCI 4761.....3  
 ENGL 4990.....3  
 EDCI 4120.....3

One Emerging Fields & Approaches course.....3

(choices available from the Office of Teacher Education or the college web site)

Foreign Language (single language or ASL with permission of English Dept... 12  
 English electives.....6  
 Must be 2000-level or above

**Mathematics Education with Concurrent Major in Mathematics Curriculum**

Total hours required for the mathematics education curriculum is 120.

**Professional Education Requirements**

EDST 2450.....3  
 EDST 2480.....4  
 EDEX 2484.....3  
 ITEC 2360.....3  
 EDST 3000.....6  
 EDST 3550.....2  
 EDSE 3271.....3  
 EDSE 4271.....3  
 EDSE 4500.....15

**Major Content**

It is necessary to complete a minimum of 50 hours in math coursework. Work must include 27 credit hours of upper-division mathematics. The grade in each course of this 50-hour requirement must be C or better. A minimum GPA of 2.5 in major content courses is required.

MATH 2200.....4  
 MATH 2205.....4  
 MATH 2210.....4  
 MATH 2310.....3  
 MATH 2250.....3  
 MATH 2800.....2  
 MATH 3500.....3  
 MATH 3340.....3  
 MATH 3205.....3  
 MATH 4600.....3  
 MATH 4000.....3  
 MATH 4150.....3  
 MATH 4510 and 4520 or  
 MATH 4340 and 4440 or  
 MATH 4200 and 4205.....6

**One of the following:**

MATH 3310.....3  
 MATH 3700.....3  
 MATH 4230.....3  
 MATH 4255.....3  
 MATH 4265.....3  
 MATH 4300.....3  
 MATH 4400.....3  
 MATH 4500.....3  
 Statistics Requirement.....3-4

*Choose one:*

STAT 2000.....3  
 STAT 2050.....4  
 STAT 2070.....4  
 STAT 3050.....3

**Modern Languages Education**

Secondary education programs are offered in French, German, and Spanish. Total minimum hours required for the modern languages education curriculum range from 120-123 credits.

Modern Language Secondary Education programs require that all candidates score at the *Advanced Low* level or higher on the American Council of Teachers of Foreign Language Oral Proficiency Interview (OPI), as well as on the Writing Proficiency Test (WPT) in their language major/the language they intend to teach. In order to be admitted to the Methods II course, students must demonstrate having attained a rating of at least the *Advanced Low* proficiency level on the OPI and the WPT. Post-baccalaureate teacher certification program students must score at these levels prior to admission to Modern Language Secondary Education programs. Given these requirements, it is important that students take advantage of study abroad experiences that will assist them in reaching high levels of second language proficiency. For information on UW study abroad opportunities, contact the International Programs office at 766-3677, or consult their web site at [www.uwyo.edu/intprograms](http://www.uwyo.edu/intprograms).

**Professional Education Requirements**

EDST 2450.....3  
 EDST 2480.....4  
 EDEX 2484.....3  
 ITEC 2360.....3  
 EDST 3000.....6  
 EDST 3550.....2  
 EDSE 3276.....3  
 EDSE 4276.....3  
 EDSE 4500.....15

**With Concurrent Major in French**

The major consists of at least 57 hours beyond FREN 2030. Students who have taken French in high school should consult the Department of Modern and Classical Languages about proper placement. FREN 1010, 1020, and 2030 do not count toward the major; however, these courses may need to be taken as prerequisites.

**French Major Content**

FREN 2040.....3  
 FREN 2130 or 3110.....3  
 FREN 2140.....3  
 FREN 3005.....1  
 FREN 3050.....3  
 FREN 3060.....3  
 FREN 4100.....3  
 FREN 4110.....3  
 FREN elective (above 2030).....3  
 FREN electives (4000-level).....6

*Other Required Courses*

COJO 2010 or THEA 1100.....3  
 EDCI 4761.....3  
 EDCI 4350.....3  
 EDCI 4450.....3  
 and  
 French (FREN) or courses related to the history, art and political science of the francophone world, in consultation with your academic adviser. [In addition to other required course work.] For those who wish to complete the ESL Endorsement, six of these hours can be earned by taking EDCI 5430 and EDCI 5440, or through study abroad in a French-speaking country..... 12

**With Concurrent Major in German**

The major consists of at least 57 hours beyond GERM 2030. Students who have taken German in high school should consult the Department of Modern and Classical Languages about proper placement. GERM 1010, 1020, and 2030 do not count toward the major; however, these courses may need to be taken as prerequisites.

GERM 2040.....3  
 GERM 2140.....3  
 GERM 3050.....3  
 GERM 4100.....3  
 GERM 4110.....3  
 GERM elective (above 2030).....3  
 GERM electives (above 3000).....15

*Other Required Courses*

COJO 2010 or THEA 1100.....3  
 EDCI 4761.....3  
 EDCI 4350.....3

EDCI 4450.....3  
 and  
 German (GERM) or courses related to the history, art and political science of the German-speaking world, in consultation with your academic adviser. [In addition to other required course work.] For those who wish to complete the ESL Endorsement, six of these hours can be earned by taking EDCI 5430 and EDCI 5440, or through study abroad in a German-speaking country..... 12

**With Concurrent Major in Spanish**

The major consists of at least 58 hours beyond SPAN 2030. Students who have taken Spanish in high school should consult the Department of Modern and Classical Languages about proper placement. SPAN 1010, 1020, and 2030 do not count toward the major; however, these courses may need to be taken as prerequisites.

SPAN 2040.....3  
 SPAN 2140.....3  
 SPAN 3050.....3  
 SPAN 3060.....3  
 SPAN 3080 or 4070.....3  
 SPAN 3100.....3  
 SPAN 3120.....3  
 SPAN 4080.....3  
 SPAN 4090 or 4310.....3  
 SPAN electives (above 3000).....6

*Other Required Courses*

COJO 2010 or THEA 1100.....3  
 EDCI 4761.....3  
 EDCI 4350.....3  
 EDCI 4450.....3  
 and

Spanish (SPAN) or courses related to the history, art and political science of the Spanish-speaking world, in consultation with your academic adviser. [In addition to other required course work.] For those who wish to complete the ESL Endorsement, six of these hours can be earned by taking EDCI 5430 and EDCI 5440, or through study abroad in a Spanish-speaking country..... 12

**Science Education Curriculum**

Concurrent majors in Science Education are offered in Biology, Chemistry, Earth System Science, and Geology.

A grade of C or better must be earned in each course included in the major content. A minimum GPA of 2.5 in major content courses is required.

**Professional Education Requirements**

EDST 2450.....3  
 EDST 2480.....4  
 EDEX 2484.....3  
 ITEC 2360.....3  
 EDST 3000.....6  
 EDST 3550.....2  
 EDSE 3275.....3  
 EDSE 4275.....3  
 EDSE 4500.....15

**Biological Science Education with Concurrent Major in Biology**

Total minimum program hours: 121

In addition to the professional education requirements, a minimum of 56 semester hours, including the major content courses (21-23 hours), biology electives (15 hours) and required electives (20 hours minimum).

**Science Electives**

At least one course from each of the following areas is required: chemistry, physics, environmental science, earth and space sciences.

**Major Content**

*Required Courses*

LIFE 1010.....4  
 LIFE 3400.....3  
 LIFE 3050.....4  
 LIFE 3500.....3  
 LIFE 3600.....4

*Plus choose two:*

LIFE 2022.....4  
 LIFE 2023.....4  
 MICR/MOLB 2021.....4

*Elective Courses*

9 hours in the Biological Sciences. Electives may be from one or more of these areas of emphasis: Microbial Emphasis; Plant and Fungal Emphasis; Animal Emphasis; Ecology Emphasis; Genetics and Evolution Emphasis (choices available from the Office of Teacher Education or the college web site). A minimum of 6 hours must be upper division.

*Other Required Electives (20 hours minimum)*

CHEM 1020.....4  
 CHEM 2300.....4  
 MICR/MOLB 3610.....4  
 PHYS 1110.....4  
 PHYS 1120.....4  
 MATH 2200.....4  
 STAT 2050.....4  
 COSC 1010 or COSC 1030.....4  
 Earth/Space Science.....3-4

**Chemistry Education with Concurrent Major in Chemistry**

Total minimum program hours: 126

In addition to the professional education requirements, a minimum of 51 semester hours, including the major content courses (42 hours), science electives (9 hours) are required.

**Required Content Courses**

CHEM 1020 or 1050	4
CHEM 1030 or 1060	4
CHEM 2230	4
CHEM 2420	4
CHEM 2440	4
CHEM 4110	3
CHEM 4100	4
CHEM 4440 or MOLB 3610	3-4
CHEM 4507 or 3550	3
LIFE 1010	4
MATH 2200	4
MATH 2205	4
MOLB/MICR 2021	4
PHYS 1110 or 1210	4
PHYS 1120 or 1220	4
STAT 2050	4

**Minimum 6 Additional Credits from:**

Any upper division (3000-level or higher)

CHEM, LIFE, MOLB course .....6

**Earth/Space Science Education with Concurrent Major in Earth System Science**

Total minimum program hours: 127

In addition to the professional education requirements, a minimum of 71 semester hours, including the major content courses (46 hours), additional courses (16 hours), and elective courses (9 hours) are required.

*Required Earth System Courses*

ESS 1000	2
ENR 1200 or LIFE 1010	4
CHEM 1020	4
CHEM 1030	4
PHYS 1110	4
ESS/GEOL 2000	4
ANTH/ENR 4310	
or ENR/GEOL 4040	3
GEOG 3480 or GEOL 3500	3-4
MATH 2200	4
ENR/GEOL 4525 or ENR 4500	3-4
ESS 4970	2
ENR/GEOL 1500 or GEOG 1010 or GEOL 1100	4
ATSC 2100 or GEOG 3450 or GEOL 3500	3-4
GEOL 2150 or GEOG 3010 or REWM/ENR 4285 or GEOG 4450	3-4
GEOG 2150 or BOT/GEOL 3150 or BOT/GEOL 4111 or GEOG 4200	3-4

*Plus choose two of the following:*

LIFE 2022	4
LIFE 2023	4
LIFE 3400	3
MICR/MOLB 2021	4
GEOG 4460	3

**Science Electives**

At least one course from each of the following areas is required: physics, biological sciences, environmental science, chemistry.

**Earth/Space Science Education with Concurrent Major in Geology**

Total minimum program hours: 123

In addition to the professional education requirements, a minimum of 64 semester hours, including the major content courses (30 hours), required electives (15 hours) and elective courses in one Emphasis Area (18 hours) are required.

*Required Geology Courses*

GEOL 1100 or 1500	4
GEOL 2000	4
GEOL 2010	3
GEOL 2020	2
GEOL 2100	4
GEOL 2080 or 4717	3-6
GEOL 4820	3

*Required Electives*

LIFE 1010	4
CHEM 1020	4
PHYS 1110	4
STAT 2050	4
MATH 1405 or 1450	3-5
ASTR 1050	4

**Elective Courses: 6 courses from the following recommended list**

ATSC 2000 or GEOG 3450	3-4
GEOL 2050	3
GEOL 2070	4
GEOL 2005 or 3005	4
GEOL 3400	4
GEOL 3500*	4
GEOL 3600	4
GEOL 4444	4
GEOL 4490	3
GEOL 4610	4
GEOL 4835	3
ECON 2400	3
GEOG 3010	3
POLS 4051	3
SOIL 4120	4
ECON 4400	3
ECON 4410	3

\*Highly recommended.

**Physics Education with Concurrent Major in Physics**

Total minimum program hours: 122

In addition to the professional education requirements, a minimum of 63 semester hours, including the major content courses (32 hours), and science (16 hours), and mathematics (15 hours) courses are required.

**Major Content***Required Courses*

PHYS 1210 or 1310	4
PHYS 1220 or 1320	4
ASTR 2310 or 2320 or PHYS 2310 or 3640	4
PHYS 2320	4
PHYS 4210	3
PHYS 4310 or ASTR 4610	3
PHYS 4410	3
PHYS 4510	3
PHYS elective, 2000-level or higher**	2
Upper division PHYS elective	3

Notes: Credit can only be earned with the following combinations as options for PHYS 2310: ASTR 1050 and ASTR 2320 or ASTR 1000 and ASTR 2310.

\*\*We encourage students to apply to become Supplemental Instruction (SI) teachers to fulfill the PHYS 2000-level or higher elective. Students must have successfully completed the course for which they would like to lead the SI group, and they must contact the instructor of the course regarding this option in advance of contacting the SI program coordinator.

*Required Science Courses*

LIFE 1010	4
CHEM 1020	4
ASTR 1000 or 1050	3-4
COSC 1010 or 1030	4

*Required Mathematics Courses*

MATH 2200	4
MATH 2205	4
MATH 2210	4
MATH 2310	3

**Social Studies Education****Professional Education Requirements**

EDST 2450	3
EDST 2480	4
EDEX 2484	3
ITEC 2360	3
EDST 3000	6
EDST 3550	2
EDSE 3273	3
EDSE 4273	3
EDSE 4500	15

**Major Content**

Concurrent majors in social studies education are offered in Geography (126 minimum credits total), History (128 minimum credits total), and Political Science (126 minimum credits total).

Majors must maintain a G.P.A. of 2.50 in major content courses and earn a grade of C or better in all content classes.

**Social Studies Education with Concurrent Major in Geography**

**Geography Requirements**

GEOG 1000.....3  
 GEOG 1010.....4  
 GEOG 1020.....3  
 GEOG 2150.....4  
 GEOG 3050.....3

Plus 17 hours of Geography (GEOG) electives, including a minimum of 9 upper division hours. Electives must be from those approved for the BA/BS in Geography program.

**Additional Content Requirements**

*Required:*

HIST 1211.....3  
 HIST 1221.....3  
 HIST 1110 or 1320.....3  
 HIST 1120 or 1330.....3  
 Upper division HIST elective.....3  
 ECON 1010.....3  
 ECON 1020.....3  
 POLS 1000.....3  
 Upper division POLS elective.....3  
 Single foreign language.....8

**Social Studies Education with Concurrent Major in History Major Content**

HIST 1211.....3  
 HIST 1221.....3  
 HIST 1251.....3  
 HIST 1110 or 1320.....3  
 HIST 1120 or 1330.....3  
 HIST 2000-level elective, Western Civilization based.....3  
 HIST 2000-level elective, Non-Western Civilization based.....3  
 HIST 3020 or 4055.....3  
 HIST 3880.....3  
 Native American content course (AIST/HIST).....3  
 Upper-division HIST electives..... 12  
 (to include 6 hours non-U.S. history and 6 hours of U.S. history)

**Additional Content Requirements**

GEOG 1010.....4  
 GEOG 1000 or 1020.....3  
 POLS 1000.....3  
 Upper division POLS elective.....3  
 ECON 1010.....3  
 ECON 1020.....3  
 Single foreign language.....8

**Social Studies Education with Concurrent Major in Political Science Political Science Requirements**

POLS 1000.....3  
 POLS 1200.....3  
 POLS 1250 or 2310.....3  
 POLS 2460 or 3600.....3  
 POLS 3100.....3  
 POLS 4100.....3  
 POLS 4110.....3  
 POLS 48XX.....3

To be selected from any one of the POLS Senior Seminar courses.

POLS electives (2000-level).....3  
 Upper division POLS electives.....6

**Additional Content Requirements**

HIST 1211.....3  
 HIST 1221.....3  
 HIST 1110 or 1320.....3  
 HIST 1120 or 1330.....3  
 Upper division HIST elective.....3  
 GEOG 1010.....4  
 GEOG 1000 or 1020.....3  
 ECON 1010.....3  
 ECON 1020.....3  
 Single foreign language.....8

**Technical Education**

This program consists of a minimum of 120 total hours. Minimum of 2.75 cumulative GPA and minimum of 2.5 content GPA required. This major will be advised at UW-Casper in the University Union building on the Casper College campus. Refer to UW-Casper or UW College of Education for specific curriculum requirements.

**Professional Education Requirements**

EDST 2450.....3  
 EDST 2480.....4  
 EDEX 2484.....3  
 ITEC 2360.....3  
 EDST 3000.....6  
 EDSE 3010.....3  
 EDST 3550.....2  
 EDSE 3277.....3  
 EDSE 4277.....3  
 EDSE 3020.....3  
 EDSE 4500.....15

**Major Content**

**Communications 10.5**  
 ENTK 1510.....3.5  
 ENTK 2510.....4  
 EDSE 3050.....3

**Manufacturing 13**  
 WELD 1700.....2.5  
 WELD 1820.....2.5  
 MCHT 2780 or 2790.....4  
 EDSE 3610.....4

**Power/Energy & Transportation 13**  
 ELTR 1570.....4  
 ELTR 1620.....1.5  
 ELTR 1760.....4.5  
 EDSE 3040.....3

**Construction 7**  
 CNTK 1860.....4  
 EDSE 3030.....3

**Additional Content 8-9**  
 STAT 2050 or 2070.....4-5  
 PHYS 1050.....4

**Areas of Concentration**

**Automotive 8-10**  
 AUTO 1510.....5  
 AUTO 1680 or 1690.....3  
 AUTO 2610.....5

**Communications 12**  
 ART 2100.....3  
 CO/M 1505.....3  
 CO/M 2190.....3  
 CO/M 2410.....3

**Drafting 8**  
 ENTK 1650.....4  
 ENTK 1710.....4

**Electronics 8.5-9.5**  
 ELTR 1700.....5  
 ELTR 1710 or 2920.....4.5 or 3.5

**Manufacturing 6 or more**  
 MCHT 1610.....2  
 MCHT 1620.....2  
 ENTK 2800.....4

**Welding 8.5**  
 WELD 1910.....3  
 WELD 2670.....2.5  
 WELD 2680.....3

**Woodworking 3**  
 CNTK 1630.....2  
 CNTK 1640.....1

**Graduate Study**

The four departments of the College of Education provide support for master's and doctoral degree programs. Faculty and staff work to deliver these programs by providing campus-based courses, courses taught through

compressed video, courses taught on-site at different locations in Wyoming, courses taught online, and courses taught in hybrid formats.

The College of Education is dedicated to offering high quality graduate programs that will provide students with the necessary skills to become educational leaders within their areas of specialization and expertise. All graduate students in the College of Education are expected to become scholars, researchers, and practitioners. They must, therefore, be knowledgeable about the ever-changing literature and research in education, the characteristics and needs of learners, and methods for facilitating learning. They must also understand the process of change and how to facilitate changes in learning settings that reflect what is known about the teaching/learning process. These skills are important to all graduate students, regardless of their areas of specialization or major emphasis.

### Degree Programs

College of Education programs fall under one of the following university approved degree titles:

- Master of Arts
- Master of Science
- Master of Science in Counseling
- Doctor of Education (Ed.D)
- Ph.D. in Education
- Ph.D. in Counselor Education and Supervision
- Ph.D. in Curriculum and Instruction

The departments in the college are approved to offer one or more of the above listed degrees with specialization in their particular areas. The specializations available are:

- Counselor Education (Counselor Education and Supervision, Mental Health Counseling, and School Counseling)
- Curriculum Studies
- Curriculum and Instruction
- Educational Administration (Adult and Post Secondary Education, K-12 Educational Leadership)
- Instructional Technology
- Literacy Education
- Mathematics Education
- Science Education
- Special Education

### Master's Programs

Currently graduate programs in the college are outcome-based. Faculty in the various specializations work with students to develop individual competencies. Consult each department for current degree requirements and program expectations.

#### Doctoral Programs Doctor of Education (Ed.D.)

The College of Education Ed.D. program prepares students for scholarly inquiry and professional leadership in education. The program consists of (1) applied research, (2) courses and professional experiences in education and related fields designed to develop a comprehensive academic basis for leadership roles in education, and (3) applied professional experiences tailored to individual needs and career goals. Each student works closely with an adviser and a supervisory faculty committee to select courses, topics of research, and professional opportunities.

Preparation in the above areas combine to:

- Convey deep scholarly knowledge of education and foster its application in practice;
- Promote a broad understanding of various methods of inquiry in education and foster its application in practice settings;
- Advocate practices that demonstrate a commitment to diversity in education;
- Foster ethical and professional research and practice in education;
- Promote excellence in applied professional practice.

The degree of Doctor of Education (Ed.D.) is offered to competent students who wish to pursue a program of study and to participate in appropriate activities in preparation for professional service and leadership in education. The program is designed to meet the needs of those for whom intensive research is not a practical prerequisite to professional goals. Doctoral students are expected to participate not only in organized coursework but also in other activities that will ensure breadth of outlook and technical competence.

- Options in the Ed.D. are:
- Curriculum and Instruction
  - Educational Administration
  - Instructional Technology

### Ph.D. in Education and Ph.D. in Curriculum and Instruction

The College of Education Ph.D. program prepares students for careers of scholarly inquiry and teaching in higher education. The program consists of (1) continuous research or inquiry, (2) courses and professional experiences in education and related fields designed to develop a comprehensive academic basis for future work in research and teaching, and (3) teaching and other related experiences tailored to individual needs and career goals. Each student works closely with an adviser and a supervisory faculty committee to select courses, topics of research and inquiry, and teaching experiences.

All coursework in the Ph.D. in Education program addresses the following goals:

- To convey deep scholarly knowledge of education and related fields
- To promote a broad understanding of various methods of inquiry in education and develop competency in several of those methods
- To advocate practices that demonstrate a commitment to diversity in education
- To foster ethical and professional research and practice in education
- To promote excellence as a college teacher

Effective preparation for the Ph.D. stems from collaborative research and inquiry into topics of mutual interest by students and faculty scholars/researchers. A major portion of the program consists of the individual student and selected faculty members(s) jointly engaged in research and inquiry. Successful Ph.D. applicants tend to have high aptitude for research and inquiry and express interest in general topics which the faculty of the college are actively inquiring and researching.

- Options in the Ph.D. in Education are:
- Educational Administration (Adult and Post Secondary Education, K-12 Educational Leadership)
  - Educational Leadership
  - Instructional Technology
  - Special Education

- Options in the Ph.D. in Curriculum and Instruction are:
- Curriculum Studies
  - Literacy Education
  - Mathematics Education
  - Science Education

## Ph.D. in Counselor Education and Supervision

The PhD program in Counselor Education and Supervision is CACREP accredited and prepares professionals for positions as faculty in Counselor Education departments through personalized, developmentally oriented coursework emphasizing the integration of theory and experiential learning. This doctoral program is ideal for self-initiating persons who thrive in an atmosphere supportive of faculty/student interactions, small class environments, intensive class discussions and opportunities for self-direction and scholarly activity. The doctoral program is built upon the basis of a strong Master's program and upholds the philosophical orientations, coherent principles, and applied knowledge and skills as counselors and supervisors.

The doctoral degree program is 60 credit hours for individuals who have completed a 60-hour CACREP master's program. Students with a 48-hour CACREP master's degree are required to complete an additional 12 semester credits. Students, through coursework, practice and faculty guidance, develop competencies in the areas of counseling, supervision, teaching, leadership, advocacy, research and scholarship.

### Learner Outcomes

Doctoral Students in the Counselor Education and Supervision will demonstrate the following learner outcomes.

- Academic and Professional Goals:** Students will demonstrate a clear vision of their professional and academic goals and academic preparation by developing and completing an approved program of study that meets the standards set forth by the Council for Accreditation of Counseling and Related Educational Programs (CACREP).
- Professional Licensure:** Students will obtain professional licensure as a Licensed Professional Counselor (LPC) in the state of Wyoming and/or develop a plan to obtain licensure for the state in which they intend to relocate upon graduation.
- Democratic Perspectives:** Students will demonstrate development as a culturally competent, creative, skilled & ethical counselor, supervisor and educator including the areas of advocacy, leadership, social justice, and promotion of caring communities.

4. **Research and Scholarship:** Students will develop a professional identity as an academic researcher by demonstrating a clear and active research agenda that includes a plan of action for professional presentations and manuscripts.

5. **Professional Development:** Students will develop a clear and diligent plan to becoming a skilled, ethically competent counselor educator.

For further information on each program, contact the College of Education, 100 McWhinnie Hall, 766-2230.

## Curriculum and Instruction Graduate Programs

### The Program

The master of arts and doctor of education in education with an option in curriculum and instruction are offered by three departments in the College of Education that collaborate to deliver the degrees: Educational Studies, Elementary and Early Childhood Education, and Secondary Education. A doctor of philosophy is being offered through the College of Education. These degree programs consist of required courses in curriculum and in research with a choice of electives chosen for their curricular emphasis. A graduate student in curriculum and instruction may choose a curricular emphasis in any of the following areas: agriculture, art, early childhood education, early childhood special education, English, English as a Second Language (ESL), literacy, mathematics, modern languages, science, social studies education and Teachers of American Indian Children.

Educators wishing to broaden their theoretical understanding of curriculum and instruction, to increase their knowledge and skills in their content specializations, to pursue additional endorsements, and to develop new strategies and materials for their classrooms should consider the Master of Arts in Education, with a concentration in Curriculum and Instruction. Educators wishing to pursue advanced graduate level study with a school-based, practitioner-oriented focus should consider the Doctorate of Education, with a concentration in Curriculum and Instruction. Educators interested in engaging more intently on educational research and in pursuing a career in higher education should consider the Doctorate of Philosophy in Education, with a concentration in Curriculum and Instruction. Successful completion of any of these

programs contributes to the professional development of educators and prepares them for roles of leadership within their subject areas, schools and/or higher education institutions.

The website for Curriculum and Instruction can be found at: ([www.uwyo.edu/ci/](http://www.uwyo.edu/ci/))

For more information about any of the Curriculum and Instruction program offerings, please contact the Curriculum and Instruction Office Associate at: 307-766-6371 or [curriculum@uwyo.edu](mailto:curriculum@uwyo.edu).

### Program Specific Degree Requirements Master of Arts in Education, Option: Curriculum and Instruction

- Minimum of 32 hours of graduate credit
- Courses delivered via Outreach using distance technologies
- Core Courses: 16 hours of program area core graduate credits
- Concentration: 15+ hours in either a certificate or endorsement program, academic content area, or general curriculum and instruction area of interest (with direction and consent of faculty adviser)
- Capstone consisting of one of the following:
  - o Plan A (thesis) – EDCI 5960: Thesis Research (4 graduate credits)
  - o Plan B (non-thesis) - EDCI 5890: Directed Professional Studies (2 graduate credits)
  - o National Board Certificate – EDCI 5890: Directed Professional Study (1 graduate credit)

### C&I Program Core:

- Classroom Assessment (EDCI 5500, 3 credits)
- Principles of Curriculum (EDCI 5000, 3 credits)
- Issues in Multicultural Education (EDCI 5450, 3 credits)
- Advanced Instructional Strategies (EDCI 5790, 3 credits)
- Action Research (EDRE 5550, 3 credits) OR Intro to Research (EDRE 5530, 3 credits)
- Midpoint Portfolio (EDCI 5400, 1 credit)

### Areas of Concentration

- Certificates or Endorsements
  - o Early Childhood and Early Childhood – Special Education (see [www.uwyo.edu/elemed/early-childhood-program/](http://www.uwyo.edu/elemed/early-childhood-program/))
  - o English as a Second Language (see [www.uwyo.edu/esl](http://www.uwyo.edu/esl))



- o Literacy (see [www.uwyo.edu/elemed/endorsements/certificate-of-literacy.html](http://www.uwyo.edu/elemed/endorsements/certificate-of-literacy.html))
- o Teachers of American Indian Children (see [www.uwyo.edu/taic/](http://www.uwyo.edu/taic/))
- Academic Content Areas – Math, History, Art, Music, Science, etc.
- Curriculum and Instruction Studies – focus on special education, educational leadership, diversity studies, counseling, instructional technology, etc.

### Program Specific Admission Requirements

Application deadlines and materials can be found on the Curriculum and Instruction program web page ([www.uwyo.edu/ci/](http://www.uwyo.edu/ci/)).

- One year teaching (or its equivalent) required for admission
- Minimum 3.0 GPA on applicant's most recent degree from an accredited institution

### Program Specific Degree Requirements Master of Arts in Education, Option: Curriculum and Instruction with an Emphasis in Teacher Certification

This program provides a post baccalaureate student the opportunity to earn a teaching certification while taking hours that lead to a master's degree. The intent is to provide distance learning opportunities required for this master's program after the certification is earned. It begins with classes in summer. Once students have completed the teacher credential portion of the program, they can apply for the master's program. NOTE: Acceptance to the master's is via application and contingent upon successful completion of the teacher credential. Meeting requirements for the master's does not guarantee acceptance.

Requirements include:

- Bachelor's degree completed prior to application
- 2.5 GPA minimum required in content course work; a 2.75 UW Institutional GPA minimum must be achieved throughout the teacher certification coursework

- Completed additional content courses, as required for the area in which certification is sought (i.e., Elementary, Secondary English, etc.). Specific course requirements for each certification area can be found in program sheets for each area, also available through the Office of Teacher Education's website: <http://www.uwyo.edu/ted/post-baccalaureate-program>
- EDST 2450 and ITEC 2360 program prerequisites
- Current Wyoming Teacher Substitute Certificate (contact the State of Wyoming Professional Teacher Standard Board)
- Teacher Credential Core Courses: 19 credits (secondary) or 28 credits (elementary)
- Admissions requirements consistent with those described in Master's of Arts in Education program (described above) with exception of one year teaching experience
- Master's Course Additional Requirements: 20-22 credits

### Teacher Credential Core Requirements:

- Introduction to Special Education (EDEX 2484, 3 undergraduate credits)
- Foundations of Education in a Diverse Society (EDST 4000, 3 undergraduate credits)
- The Art and Science of Teaching (EDCI 5550, 4 graduate credits)
- Advanced Topics in Pedagogy (EDCI 5250, 3 graduate credits)
- Educational Assessment (EDST 3550, 2 undergraduate credits)
- Seminar in Assessment (EDCI 5560, 1 graduate credit)
- Methods II (Secondary Only; EDSE 42XX, 3 undergraduate credits)
- Humanities (Elementary Only; EDEL 4109, 5 undergraduate credits)
- Science (Elementary Only; EDEL 4409, 5 undergraduate credits)
- Literacy (Elementary Only; EDEL 4309, 2 undergraduate credits)
- Residency in Teaching (EDSE 4500 Secondary; EDEL 4500 Elementary, 11 undergraduate credits)
- Internship (EDSE 5990 Secondary and Elementary, 4 graduate credits)

### C&I Master's Core Requirements:

- Principles of Curriculum (EDCI 5000, 3 credits)
- Issues in Multicultural Education (EDCI 5450, 3 credits)
- Advanced Instructional Strategies (EDCI 5790, 3 credits)
- Action Research (EDRE 5550, 3 credits) OR Intro to Research (EDRE 5530, 3 credits)
- Midpoint Portfolio (EDCI 5400, 1 credits)
- Classroom Assessment (EDCI 5500, 3 credits) OR EDCI 5XXX (elective; in consultation with adviser)
- Capstone consisting of one of the following:
  - o Plan A (thesis) - EDCI 5960: Thesis Research (4 credits)
  - o Plan B (non-thesis) - EDCI 5890: Directed Professional Studies (2 credits) and EDCI 5XXX (elective, in consultation with adviser).

For more information, contact the Office of Teacher Education or visit the web page (<http://www.uwyo.edu/ted/post-baccalaureate-program>)

### Program Specific Admission Requirements

Application deadlines and materials can be found on the Curriculum and Instruction program web page ([www.uwyo.edu/ci/](http://www.uwyo.edu/ci/)).

### Program Specific Degree Requirements Doctor of Education (Ed.D.) in Education, Option: Curriculum and Instruction

- Bachelor and master's degree required for admission
- 30 credits transferable (as part of master's) from UW or other accredited university
- 3 years teaching experience (required)
- EDRE 5530 Introduction to Research (or equivalent; required)
- Minimum of 80 graduate credit hours in the following:
  - o Core Courses (15 graduate credit hours)
  - o Cognate (Area of Interest) (18 graduate credit hours)
  - o Research (9-12 graduate credit hours)
  - o Practicum/Internship (2 graduate credit hours)
  - o Dissertation (6 graduate credit hours)

**Core courses**

- EDAD 5600 - Diversity in Education
- EDCI 5730- Learning Theories: Research & Praxis
- EDAD 5720 Educational Leader as Change Agent
- EDAD 5650 - Educational Leader as Communicator
- EDRE 5660- Proposal Writing

**Cognate courses and advanced courses (minimum of 18 credits)**

- EDCI 5800 – Curriculum Development
- EDCI 5790 – Advanced Instructional Strategies
- An additional 12 credits (elective, in consultation with adviser and/or committee)

**Advanced research courses (minimum of 9-12 credits)**

- EDRE 5530 Introduction to Research (may have been met in master's program)
- Some combination of the following (in consultation with adviser and/or committee)
  - EDRE 5600 Ed Research 1 - Descriptive Research
  - EDRE 5610 Ed Research 2 - Group Comparison Research
  - EDRE 5620 Ed Research 3 - Correlational Research
  - EDRE 5630 Ed Research 4 - Multivariate Research
  - EDRE 5640 Introduction to Qualitative Research
  - EDRE 5650 Advanced Qualitative Research
  - EDRE 5670 Mixed Methods Research

**Practicum/Internship**

- EDCI 5580 - Internship (2 credits)

**Dissertation Hours**

- The required number of dissertation credits is a minimum of 6.
- Preliminary exam (after coursework is completed): Guidelines determined by program, department, or committee
- Problem-Based Dissertation or project (after preliminary exam): Guidelines determined by program, department, or committee

**Notes:**

These requirements for an Ed.D. in Education are minimum requirements only.

**Program Specific Admission Requirements**

Application deadlines and materials can be found on the Curriculum and Instruction program web page ([www.uwyo.edu/ci/](http://www.uwyo.edu/ci/))

**Program Specific Graduate Assistantships**

Applicants interested in a Graduate Assistantship must submit a graduate assistantship application to the Curriculum and Instruction Office.

**Program Specific Degree Requirements Doctor of Philosophy (Ph.D.) in Education, Options in Curriculum Studies, Literacy Education, Mathematics Education, and Science Education**

- Bachelor and master's degree required for admission
- 30 credits transferable (as part of master's) from UW or other accredited university
- Residency requirement: 1-2 consecutive full-time semesters on campus
- Minimum of 81 total credits required in the following areas:
  - Core Courses (9 graduate credit hours)
  - Cognate (Area of Interest) (18 graduate credit hours)
  - Research (12-15 graduate credit hours)
  - Dissertation (12 graduate credit hours)

**Core courses (minimum of 9 credits)**

All PhD option areas require PRST 5610, Intro to Doctoral Studies. In addition, doctoral students, with direction from their committees, will choose a minimum of two additional courses from the remaining five core courses:

- PRST 5900 (Practicum in College Teaching)
- EDCI 5810 (Writing for Professional Publication)
- EDCI 5730 (Learning and Cognition)
- EDRE 5660 (Dissertation/Thesis Prospectus Writing)

We also understand that students may meet the requirements for the core content in other ways, such as a master's degree in an area that emphasizes coursework in diversity or multi-cultural education. Committees may determine that the requirements for additional course(s) have been met. However, Introduction to Doctoral Studies may not be waived.

**Cognate courses and advanced courses (minimum of 18 credits)**

- EDCI 5600 (Diversity in Education)
- EDCI 5870 (Learning Theories: Research and Praxis)
- EDCI XXXX (Elective, in consultation with adviser and/or committee)
- 9 additional courses in some area of advanced area of study

**Advanced research courses (minimum of 15 credits)**

- EDRE 5530 (Introduction to Research) (may have been met in master's program)
- Some Combination of the following (in consultation with adviser and/or committee)
  - EDRE 5600 Ed Research 1 - Descriptive Research
  - EDRE 5610 Ed Research 2 - Group Comparison Research
  - EDRE 5620 Ed Research 3 - Correlational Research
  - EDRE 5630 Ed Research 4 - Multivariate Research
  - EDRE 5640 Introduction to Qualitative Research
  - EDRE 5650 Advanced Qualitative Research
  - EDRE 5670 Mixed Methods Research

**Dissertation Hours**

- The required number of dissertation credits is a minimum of 12.
- Preliminary exam (after coursework is completed): Guidelines determined by program, department, or committee
- Dissertation (after preliminary exam): Guidelines determined by program, department, or committee

**Notes:**

These requirements for a PhD in Education are minimum requirements only.

**Program Specific Admission Requirements**

Application deadlines and materials can be found on the Curriculum and Instruction program web page ([www.uwyo.edu/ci/](http://www.uwyo.edu/ci/)).

**Program Specific Graduate Assistantships**

Applicants interested in a Graduate Assistantship must submit a graduate assistantship application to the Curriculum and Instruction Office.

## Certificates and/or Endorsements

### Teachers of American Indian Children Certificate Leading to a Wyoming Endorsement

In this graduate program, the University of Wyoming certifies that those who complete its five specialized courses possess the attitudes, knowledge, and competence necessary to effectively teach American Indian Children. Upon completion, students will receive official recognition of their achievement on their University of Wyoming transcripts and an official certificate.

Required program courses:

- EDCI/AIST 5450 – Issues in Multicultural Education
- EDCI/AIST 5110 – Educational Foundations of American Indian Education
- EDCI/AIST 5121 – History and Philosophy of American Indian Education
- EDCI/AIST 5130 – Cultural Foundations of American Indian Education
- EDCI/AIST 5141 – Instructional Methods in American Indian Education

For more information, visit the web page (<http://www.uwyo.edu/taic>)

### Literacy Certificate Leading to a Wyoming Reading Endorsement

The University of Wyoming offers the required courses in the graduate literacy program. The program is designed to serve graduate level K-12 teachers in Wyoming who wish to obtain the Wyoming Reading Endorsement, and those who choose to apply the course work toward a master's or doctoral degree in Curriculum & Instruction.

Required Courses:

- EDCI 5710 [5070]: Genre-Based, Discipline-Based Literacies (3 credits)
- EDCI 5720: Literacy Difficulties: Assessment and Instruction (3 credits)
- EDCI 5750: Research in Literacy Learning, Teaching, and Assessment in Classrooms, Part 1 (K-6) (3 credits)
- EDCI 5760 [5870]: Social Literacies (3 credits)
- EDCI 5755 Research in Literacy Learning, Teaching, and Assessment in Classrooms, Part 2 (K-6)
- EDCI 5770 Research in Literacy Learning, Teaching, and Assessment in Classrooms, Part 1 (6-12)

- EDCI 5775 Research in Literacy Learning, Teaching, and Assessment in Classrooms, Part 2 (6-12)
- Endorsement K-6: 18 hours - EDCI 5760, 5710, 5720, 5750, 5755 plus one elective  
 Endorsement 6-12: 18 hours - EDCI 5760, 5710, 5720, 5770, 5775 plus one elective  
 Endorsement K-12: 21 hours - EDCI 5760, 5710, 5720, 5750, 5755, 5770, 5775

#### Electives

- EDCI 5120 Young Adult Literature.....3  
 EDCI 5160 Recent Trends in Children's and Young Adult Literature .....3

For more information, visit the web page (<http://www.uwyo.edu/elemed/endorsements/certificate-of-literacy>)

### English as a Second Language Certificate leading to a Wyoming English as a Second Language Endorsement

The English as a Second Language (ESL) endorsement is designed to meet the ten state of Wyoming standards for teaching second language learners. It is offered in conjunction with departments in the College of Arts and Sciences. The need to address the specific educational issues and challenges English language learner students face by way of culturally and linguistically responsive professional practices is of critical importance to the vitality of our classrooms, schools, and communities

Required Courses:

- LANG/ENGL 4785: Linguistics, Language Teaching, and Social Context (3 credits)
- EDCI 4350/5350: Introduction to Second Language Acquisition(3 credits)
- EDCI 5430: Theory and Methods of ESL I (3 credits)
- EDCI 5440: Theory and Methods of ESL II (3 credits)
- EDCI 5580: Internship in English as a Second Language (3 credits)

For more information, visit the web page (<http://www.uwyo.edu/esl>)

### The Early Childhood Special Education Program (Birth to Five) Leading to Wyoming Certification

Post-baccalaureate students who have earned a BA/BS in Elementary Education, Family and Consumer Sciences/Child Development Option, or a related field in early childhood development are eligible for this program. This is a pre-k program and does not prepare candidates to work in kindergarten or primary grade classrooms.

Required courses:

- EDEC 5220: Children with Disabilities: Birth to Five (3 credits)
- EDEC 5230: Curriculum and Materials for the Young Child with Disabilities (3 credits)
- EDEC 5240: Evaluation of Young Children with Disabilities (3 credits)
- EDEC 5250: Legal Issues in Early Childhood Special Education (3 credits)
- FCSC 4124: Families of Young Children with Special Needs (3 credits)
- EDEC/FCSC/NURS 4350: Health Management Issues in Early Childhood Special Education\* (3 credits)
- EDEC 4320: Oral and Written Language Acquisition (3 credits)
- EDCI 5580: Internship in Early Childhood Special Education (6 credits)

\*Cross-listed with Family and Consumer Sciences and Nursing

For more information, visit the web page (<http://www.uwyo.edu/elemed/ec/>)

## Curriculum and Instruction (EDCI)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**4000. Environmental Education for Teachers. 2-3 (Max. 6).** An introduction to the philosophy, methods and content of environmental education for students in elementary and secondary education. *Prerequisite:* senior standing.

**4050. Minority Sexual/Gender Identity Issues in Education. 3.** How youth of minority sexual and gender identities have been educated: the challenges they experience in U.S. K-16 schools, the risk factors related to academic success (health, safety, and emotional well being), and strategies to create safe, caring, and inclusive learning environments for all youth. Dual listed with EDCI 5050; cross listed with WMST 4050. *Prerequisites:* completion of WA and WMST 2000 with C or better.

**4120 [LIBS 4120]. Literature for Young Adults. 3.** Designed for prospective and working library media specialists and teachers who wish to strengthen their backgrounds in the utilization of literature with young adults in classrooms and libraries. The course involves

the reading and critique of literature. Dual listed with EDCI 5120. *Prerequisite:* senior level or graduate standing. (Offered based on sufficient demand and resources)

**4140 [LIBS 4140]. Storytelling. 3.** An investigation of storytelling as an art and as an aid to instruction. Emphasis is on literature for pre-school and elementary age children. Dual listed with EDCI 5140. *Prerequisite:* junior standing or EDCI 4120 is recommended. (Offered based on sufficient demand and resources)

**4160 [LIBS 4160]. Recent Trends in Children's and Young Adult Literature. 3.** Important new developments in the subject matter, settings and style of children's and young adult books are identified and studied. Students in this course are expected to have a strong basic knowledge of children's and young adult literature. Dual listed with EDCI 5160. *Prerequisite:* EDCI 4120.

**4300. Introductory Diagnosis Corrective Reading Instruction. 3-4 (Max. 4).** Provides students with opportunities to work with children who have severe reading problems. Students in this class tutor one or two children for an entire semester under the direct guidance of the course instructor and the supervising teacher of the teaching division of the reading clinic. *Prerequisite:* consent of instructor.

**4330. Advanced Diagnosis, Corrective Reading Instruction. 3-4 (Max. 4).** Designed to provide students with opportunities to work with children who have reading problems. Students in this class tutor under the direct guidance of the course instructor. *Prerequisites:* EDCI 3100, 4300 and consent of instructor.

**4340. Integrating Computer-Based Technologies in Teaching \_\_\_\_\_. 1-3 (Max. 6).** Equips students with information, skills and insights necessary for successful integration of computer-based technologies into classroom teaching. Content includes modeling of techniques, teaching strategies and appropriate applications of computer-based technologies in specific content areas and consideration of computer-related issues facing educators. *Prerequisite:* ITEC 2360 or equivalent.

**4350. Introduction to Second Language Acquisition. 3.** Addresses theoretical and conceptual foundations of working with second language learners. Focus is on the classroom applications of this theoretical base to interactions with English language learners, curriculum, instruction, assessment and evaluation, classroom organization, and school-community relations. Native American language revitalization issues are featured. Dual listed with EDCI 5350.

**4400 [3400]. The Middle School. 2-3 (Max. 3).** This is the basic professional course in the program for the preparation of middle years educators. A review of the reorganization of junior high school leading to the establishment of the middle school philosophy, the teacher, and the unique function of the middle school compose the essential outline topics of the course. *Prerequisites:* EDST 3000, EDST 2450 or PSYC 4300, WA, 2.5 GPA.

**4450 [4250]. Issues In Multicultural Education. 3.** Provides the future teacher and other interested students with a better understanding of current issues and social foundations of multicultural America. Enables more accurate educational decisions related to utilizing strengths and diversity of each cultural group. Dual listed with EDCI 5450. *Prerequisite:* students must have at least 12 credit hours in education classes.

**4665. History and Philosophy of American Education. 3.** Provides cultural, philosophical, and historical perspectives drawn from the American experience and centered in the American ideology of equality of educational opportunity. Major trends and philosophies that have developed, and are developing, in American education will be shared through discussion, presentations, and written projects. Dual Listed with EDCI 5665. Cross listed with HIST 4665. *Prerequisites:* Completion of WA with C or better.

**4761. Linguistics, Sociolinguistics, and Social Literacies for Teachers. 3.** Introduces key concepts in linguistics, sociolinguistics, and social literacies that are necessary for understanding and working with children from diverse linguistic and cultural backgrounds. As such, the course was designed to redirect students' attention from a sole focus on schooled language and literacy to an understanding of the diverse language and literacy knowledges and skills that children bring to school from their own sociocultural contexts. *Prerequisite:* EDST 2480.

**4762. Essential Sociolinguistics for English as a Second Language Learning and Teaching. 3.** This course is designed for the candidates in the ESL endorsement and graduate certificate program to focus on English as a second language teaching and learning. The issues addressed will include: (a) social and cultural approach to language and literacy; (b) second language learning and identity; (c) culture, ethnicity, race, and language variations; (d) bilingualism, and (e) language attitudes. *Prerequisite:* admission to the English as a Second Language Endorsement Program.

**5000. Principles of Curriculum. 3.** Provides an overview of general understandings fundamental to the study of all aspects of curriculum to include pre-school, kindergarten thru high school. Consideration is given to the various factors, institutions and societal issues that impinge on and affect the decision making processes of curriculum developers. *Prerequisite:* graduate standing in education.

**5010. Supervision of the School Music Program. 2-4 (Max. 4).** Two sections: vocal; instrumental. Designed for graduate students who have a background in music education and for other interested graduate students in education. *Prerequisite:* 12 hours of education and graduate standing.

**5020. Curriculum Workshop. 1-4 (Max. 4).** Two sections: vocal; instrumental. Designed for graduate students who have a background in music education and for other interested graduate students in education. *Prerequisite:* 12 hours of education and graduate standing.

**5050. Minority Sexual/Gender Identity Issues in Education. 3.** How youth of minority sexual and gender identities have been educated: the challenges they experience in U.S. K-16 schools, the risk factors related to academic success (health, safety, and emotional well being), and strategies to create safe, caring, and inclusive learning environments for all youth. Dual listed with EDCI 4050; cross listed with WMST 5050. *Prerequisites:* completion of WA and WMST 2000 with C or better; graduate standing; completion/concurrent enrollment in ADED 5260.

**5070. Educational Trends. 1-6 (Max. 6).** Provides reading, discussion, research, and appraisal of new methods, materials, equipment, and experimental programs concerned with the improvement of education as it pertains to curriculum and instruction. The maximum allowable credit applies to the total offerings under this number. *Prerequisite:* 12 hours of education courses.

**5110. Foundations of American Indian Education. 3.** Examines cultural, geographical, linguistic, spiritual, political and societal factors before, during and after colonization of the Americas. Definitions and day-to-day realities of terms like ethnocentrism, cultural relativism, assimilation, acculturation, and institutional racism. Development of insights into positive teacher-pupil-community relationships that honor culture and language differences and enhance achievement. Cross listed with AIST 5110. *Prerequisites:* AIST 1001 and 15 credit hours of AIST or EDST.

**5120. Literature For Young Adults. 3.** Designed for prospective and working library media specialists and teachers who wish to

strengthen their backgrounds in the utilization of literature with young adults in classrooms and libraries. Involves reading and critiquing literature. Dual listed with EDCI 4120. *Prerequisite:* senior level or graduate standing.

**5121. History and Philosophy of American Indian Education. 3.** Addresses the history of Indian education in the U.S. and Canada, examination of missionary initiatives, government programs, and tribal efforts. Review of documentary accounts of Native education, review autobiographical accounts of Native teachers and children. We will develop insight necessary for development of appropriate teaching methods and materials. Cross listed with AIST 5121. *Prerequisites:* Post-Baccalaureate standing.

**5130. Cultural Foundations of American Indian Education. 3.** In-depth study and analysis of the educational experiences of American Indians, focusing on contemporary educational issues and experiences, examining the impacts of cultural orientations, stereotypes, bias and other issues on the educational attainment of American Indian students. Critique instructional practices and programs developed addressing the needs of American Indian students. Cross listed with AIST 5130. *Prerequisites:* Post-Baccalaureate status.

**5140. Storytelling. 3.** An investigation of storytelling as an art and as an aid to instruction. Emphasis is on literature for preschool and elementary age children. Dual listed with EDCI 4140. *Prerequisite:* junior standing or EDCI 4120 is recommended.

**5141. Instructional Methods in American Indian Education. 3.** Addresses culturally responsive methodologies for teaching American Indian students, review of documentary accounts of Native education and autobiographical accounts of Native teachers and children as students develop appreciation of the complexity and difficulties of Native education. Students acquire insight necessary for development of appropriate teaching methods and materials. Cross listed with AIST 5141. *Prerequisites:* Post-Baccalaureate status.

**5160. Recent Trends in Children's and Young Adult Literature. 3.** Important new developments in the subject matter, settings and style of children's and young adult books are identified and studied. Students in this course are expected to have a strong basic knowledge of children's and young adult literature. Dual listed with EDCI 4160. *Prerequisite:* EDCI 4120. (Offered based on sufficient demand and resources)

**5205. Methods of Teaching Middle-Level Mathematics. 3.** Research based pedagogy and pedagogical content knowledge for teach-

ing middle-level mathematics. Designed for practicing teachers of middle-grades mathematics. Cross Listed with NASC 5205. *Prerequisites:* admission to the SMTC program.

**5215. Using Instructional Technology for Middle-Level Mathematics. 3.** Covers the use of technology appropriate to middle-level mathematics teaching, such as microworlds, geographic information systems, spreadsheets, and other content appropriate technologies. Cross listed with NASC 5215. *Prerequisites:* admission to the SMTC Program.

**5225. Assessment for Middle-Level Mathematics. 3.** Middle-level Mathematics Initiative teacher participants examine, analyze, and implement a variety of assessments that are aligned with standards and instruction appropriate to the middle level math learner. Cross listed with NASC 5225. *Prerequisites:* admission to the SMTC program.

**5250. Advanced Topics in Pedagogy. 3.** A graduate level seminar to be taken concurrently with undergraduate methods courses in specific content areas (EDSE 425X-4260, EDEL 4309) EDCI 5250 is restricted to students pursuing teacher certification leading to a Master of Arts in Curriculum and Instruction. *Prerequisite:* Successful completion of EDCI 5550, EDST 3500, EDCI 5870, Seminar in Assessment, earned Bachelor's degree from an accredited institution.

**5270. Seminar for Early Career Teachers. 3.** Provides an opportunity to engage in critical issues facing beginning teachers as well as to address pressing challenges faced. Provides an opportunity for mutual support and academic engagement around these critical issues as well as propel the beginning teacher further into the teaching profession. *Prerequisite:* teaching credentials required.

**5300. Perspectives In Reading Instruction. 3.** Designed to provide an intense examination of reading instruction for the large number of students in typical classrooms. The teaching and learning of basic reading skills is analyzed and discussed. Reading materials, alternative approaches to reading instruction, and classroom organization schemes are examined. A major thrust of the class is the application of current developments in reading to classrooms.

**5310. Reading Comprehension Processes and Instruction. 3.** Designed to acquaint the student with recent developments, research findings, and newer practices. Viewpoints expressed by experts are compared, and an emphasis is given to the objectives of knowledge and to an understanding of attitude and skills. *Prerequisite:* graduate standing.

**5320. The Writing Process in the Classroom. 3.** Designed to acquaint the student with recent developments, research findings, and newer practices in the area of composition. Viewpoints expressed by experts are compared and an emphasis is given to the objectives of knowledge and to an understanding of attitudes and skills. *Prerequisite:* graduate standing.

**5350. Introduction to Second Language Acquisition. 3.** Addresses theoretical and conceptual foundations of working with second language learners. Classroom applications of this theoretical base to interactions with English language learners, curriculum, instruction, assessment and evaluation, classroom organization, and school-community relations. Native American language revitalization issues are featured. Dual Listed with EDCI 4350. *Prerequisite:* graduate standing.

**5390. Literature and Reading/Writing Instruction. 3.** Links the use of literature for children with instruction and practice in reading, writing, spoken language, and critical thinking skills. Students are expected to have a strong background knowledge of literature for children before taking this course. Dual listed with EDCI 4390. *Prerequisite:* EDEL 2280, or basic children's literature course work.

**5400. Midpoint Portfolio Reflection. 1.** Allows students to reflect, self-assess, and receive guidance related to their progress in the C&I Master's Program. Requirements include: self assessment of progress toward the C&I program outcomes, completion of a series of research abstracts, formation of the students' graduate committees and approval of programs of study. *Prerequisites:* admission to the Curriculum and Instruction Master's Program and completion of at least 12 hours of EDCI coursework.

**5430. Theory and Methods of ESL I. 3.** Provides an overview of theoretical and practical considerations in the teaching of English as a second/foreign language; acquaints students with different approaches, methods and procedures in TESL/TEFL; examines issues in the profession; requires a teaching/tutoring component. *Prerequisite:* EDCI 5350.

**5440. Theory and Methods of ESL II. 3.** Continues the theoretical and practical considerations in the teaching of ESL. Emphasis on Specifically Designed Academic Instruction in English (SDAIE) and literacy development for intermediate and advanced English language learners. Application of different approaches, methods, and procedures in TESL/TEFL. Development of curriculum. Issues in the profession. Requires teaching/tutoring component. *Prerequisites:* EDCI 5430.

**5450. Issues in Multicultural Education.**

**3.** Provides future and inservice teachers and other interested students with a better understanding of current issues and social foundations of multicultural America. Enables more accurate educational decisions related to utilizing strengths and diversity of each cultural group. Additional assignments are required of students completing this course for graduate credit. Dual listed with EDCI 4450. *Prerequisite:* 12 credit hours of education classes.

**5480. Short Course. 1-6 (Max. 6).** Provides offerings in special topics in curriculum and instruction on the basis of need. The maximum allowable credit is six semester hours. *Prerequisite:* 6 hours of education courses.

**5490. Individual Problems. 1-6 (Max. 6).** Provides flexible credit for seniors who may need the credit for graduation, or for students who wish to undertake intensive study of a special problem identified in a regular class. *Prerequisite:* 12 hours of education courses and consent of instructor.

**5500. Classroom Assessment. 3.** Provides reading, discussion, and research examining a variety of classroom-based assessments with a focus on the alignment of teaching, learning, and classroom assessment at the P-12 level. *Prerequisite:* graduate status.

**5510. Improvement of Instruction In: 1-3 (Max. 12).** This series of courses is designed to acquaint the student with recent developments, research findings, and newer practices in each of the fields listed. Viewpoints expressed by experts are compared, and an emphasis is given to the objectives of knowledge and to an understanding of attitudes and skills. *Prerequisite:* graduate standing and consent of instructor.

**5515. National Board Certification Seminar. 1-3 (Max. 12).** Provides information and support for teachers in the National Board Certification process. Content includes: reviewing, understanding, and applying best practice research; development of differentiated instruction; integration of formative assessment and reflective practice; understanding problem solving across the curriculum; and focuses on writing strategies for National Board Certification success. *Prerequisites:* graduate student standing.

**5550. The Art and Science of Teaching. 4.** Students will engage in a variety of experiences related to teacher decision making. Students research a variety of curriculum and instruction topics to discern the range of theories and associated models and develop personal theories and methods they plan to employ in their classrooms. *Prerequisite:* successful completion of EDST 4000 and earned Bachelor's degree from an accredited institution.

**5560. Seminar in Assessment. 1.** One credit hour course is designed for students in the (post baccalaureate) teaching credential program with master's option. Covers important concepts of assessment such as teachers as graders, self-and peer-assessment techniques, standardized assessment instruments, challenges facing new teachers, using assessment for planning/modifying instruction to improve learning experiences, and differentiated assessment in diverse classrooms. *Prerequisites:* successful completion of (grade C or higher) or concurrent registration in EDST 3550 or EDST 3500.

**5580. Internship. 1 - 8. (Max 12).** An internship experience may be required as part of the planned program in curriculum and instruction. A maximum of eight hours may be counted in meeting the minimum requirements of a graduate degree, but additional credit may be taken beyond this limit for the recording of appropriate supervised experience. *Prerequisite:* 15 hours of education, consent of department head, and graduate standing.

**5600. Diversity in Education. 3.** Provides practicing teachers and graduate level students with an understanding of the macrolevel influences on diversity in education. Includes an examination of competing models of diversity in education as well as reviews critical scholarly work in the field (including alternative methodological frameworks for engaging in this research). Includes competencies for developing advocacy-oriented skills and dispositions. *Prerequisite:* graduate level students only.

**5650. Early Childhood Secondary Education Curriculum. 3.** Graduate students specializing in curriculum and instruction work intensively on key issues, questions, and/or themes pertaining to early childhood through secondary school curriculum and participation in systematic, critical, interpersonal evaluation. *Prerequisite:* EDCI 5000 or concurrent enrollment in EDCI 5000.

**5665. History and Philosophy of American Education. 3.** Provides cultural, philosophical, and historical perspectives drawn from the American experience and centered in the American ideology of equality of educational opportunity. Major trends and philosophies that have developed, and are developing, in American education will be shared through discussion, presentations, and written projects. Dual Listed with EDCI 4665. Cross listed with HIST 5665. *Prerequisites:* Graduate student status; priority enrollment given to students registered in the C&I/Curriculum Studies area.

**5700. Institute In Reading. 2-6 (Max. 6).** *Prerequisite:* graduate standing.

**5710. Genre-based, Discipline-based Literacies. 3.** Designed to provide educators with knowledge of reading factors as they relate to various genres and disciplines. Includes new literacies, assessment and development of comprehension, writing and oral language as learning tools, techniques for the development of vocabulary, questioning and study strategies appropriate to various disciplines and genres. *Prerequisite:* at least one year of successful classroom teaching experience in a recognized K-12 school setting.

**5720. Literacy Difficulties: Assessment and Instruction. 3.** Examines contemporary research and practice related to 1) literacy difficulties, 2) classroom assessment, and 3) RTI & school literacy reform. Students will read and discussion research addressing these issues and also engage in projects focused on intervention with struggling students and school wide-systems for literacy intervention. *Prerequisite:* at least one year of successful teaching experience in a recognized K-12 school setting.

**5750. Research in Literacy Learning, Teaching, and Assessment in Classrooms, Grades K-5, Part I. 3-6 (Max. 6).** Examines contemporary research and practice in literacy instruction. Read about and discuss cutting-edge literacy methods related to 1) word recognition, 2) beginning and fluent text reading, 3) reading comprehension, and 4) vocabulary development. In addition, students will analyze their current literacy instruction and develop, implement, and evaluate lessons that involve new instructional approaches. *Prerequisites:* EDEC 4320 or EDCI 4330, 5310 or 5320 or graduate standing in education.

**5755. Research in Literacy Learning, Teaching, and Assessment in Classrooms, Grades K-5, Part II. 3.** Second of two related courses that address research in literacy instruction in elementary classrooms. The two-course sequence is required for students seeking the Wyoming K-5 Literacy Endorsement. Can also serve as a literacy content course in the Literacy Education Ph.D. option or as an elective in other graduate degree programs. *Prerequisites:* EDCI 5750.

**5760. Social Linguistics Literacies. 3.** Introduces key concepts in linguistics, sociolinguistics, and social literacies necessary for understanding and working with children from diverse linguistic and cultural backgrounds. Redirects focus from schooled language and literacy to an understanding of the diverse language and literacy knowledges and skills that children bring from their own sociocultural contexts. *Prerequisite:* at least one year of successful classroom teaching experience in a recognized K-12 school setting.

**5770. Research in Literacy Learning, Teaching, and Assessment in Classrooms, Part I (6-12). 3.** Critically examines reading-writing research for the express purpose of recognizing fundamentals of superior studies. Students are encouraged to select and pursue a topic in reading-writing research for intensive examination. Students may pursue areas of emphasis in elementary, secondary, or higher education. *Prerequisites:* Graduate standing in education.

**5775. Research in Literacy Learning, Teaching, and Assessment in Classrooms, Part II (6-12). 3.** Designed to be the second in a two-course sequence that focuses on research and practice in adolescent literacy learning, teaching, and assessment. Will focus on applying research to practice. *Prerequisites:* Graduate standing in education.

**5790. Advanced Instructional Strategies. 3.** Designed to allow graduate students and other educators to explore in depth the various instructional strategies that are available to them, research behind the development of these strategies, learning theories and the philosophy upon which they are based, curriculum standards that have encouraged their development, and assessment techniques that effectively measure student's learning. *Prerequisite:* graduate standing and classroom teaching experience.

**5800. Curriculum Development. 3.** The process of developing an early childhood through grade 12 curriculum are learned. Factors involved in initiating, developing, and evaluating curricula are studied. *Prerequisite:* EDCI 5000 and 5650.

**5810. Writing for Professional Publications. 3.** Designed to give students a structured experience with writing to publish in professional journals. Students will be expected to have written and submitted a publishable article by the end of the course. *Prerequisite:* 8 hours of graduate coursework completed.

**5820. Research Methods in Literacy Education. 3.** Doctoral seminar to examine the array of research methods (both quantitative and qualitative) employed in literacy research. *Prerequisite:* graduate student status.

**5870. Seminar. 1-6 (Max. 8).** Advanced students in curriculum and instruction work intensively on current issues and problems and participate in systematic, critical interpersonal evaluation. Students may pursue areas of emphasis in elementary, secondary, or higher education in the seminar. Only six hours may be allowed in the curriculum and instruction program on a student's program under this number. *Prerequisite:* consent of instructor and graduate standing.

**5880. Special Problems. 1-6 (Max. 9).** Provides a broad perspective through selected reading material and, wherever possible, the student collects and uses original information from a practical school situation. All work is done independently under the direction of a faculty member. As many conferences are held as necessary to assure successful completion of the project. *Prerequisite:* consent of instructor and department head, and graduate standing.

**5890. Directed Professional Study. 1-6 (Max. 9).** Provides additional opportunity for the student to pursue advanced graduate work through independent research. Projects are done under the direction of a graduate faculty member. Offered in the areas of business education and distributive education. *Prerequisite:* consent of the instructor, the department head and graduate standing.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

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## Literacy Education (LTED)

**5800. Theoretical Perspectives on Literacy Processes and Practices. 3.** A doctoral seminar aimed at providing students with a broad introduction to theoretical perspectives on literacy processes and practices as well as the functions of theory in literacy research. Fea-

tures reading and discussion of key works from cognitive, sociocultural, and critical research in literacy. *Prerequisite:* graduate student status.

**5820. Research Methods in Literacy Education. 3.** Doctoral seminar to examine the array of research methods (both quantitative and qualitative) employed in literacy research. *Prerequisite:* graduate student status.

**5830. Review, Critique, and Synthesis of Literary Research. 3.** A doctoral seminar focused on a survey and analysis of historical and contemporary research in literacy. *Prerequisite:* Graduate standing.

**5840. Research in Literacy Education with Diverse Populations. 3.** Examines historical and current research on literacy practices with diverse students including African American, Latino, American Indian/Alaska Native, and English Language Learners of many cultures and linguistic groups. *Prerequisite:* graduate student status.

**5860. History of Literacies. 3.** Explores the nature of history and historical inquiry, the history of literacies from several perspectives, the history of global literacies across time, and the literacy histories of a diverse range of cultural groups. Also examines the history of literacy instruction in the United States. *Prerequisite:* Graduate standing.

**5870. Special Topics in Literacy Education. 1-3 (Max 12).** Advance students in literacy education work intensively on current issues and problems and participate in systematic, critical exploration of an identified issue or problem. Topics may include the following: New Literacy Studies, Adolescent, Adult, and Workplace Literacies; Disciplinary Literacy Research. May be repeated with different topics, up to 12 credit hours. *Prerequisites:* Permission of instructor and graduate standing.

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## Mathematics Education (EMAT)

**5100. Theory and Research for Mathematical Learning. 3 (Max. 6).** Advanced study of theory and research related to learning of mathematics, with attention to significant human mental development factors. Critically examines the scholarly basis for mathematical learning, including reviews of epistemological foundations, research-based factors, core issues, and advocacies for educational practices. *Prerequisites:* enrollment in Mathematics Education Ph.D. specialization or permission of the instructor.

**5200. Advanced Study of Mathematics Curriculum, Assessment, and Evaluation. 3 (Max. 6).** Advanced study of theory, research and practices related to curriculum,

assessment and evaluation in mathematics education. Critically examines the historical and contemporary influences on these, including mathematical, philosophical, psychological, pedagogical, social and political forces and factors. *Prerequisites:* enrollment in Mathematics Education Ph.D. program or permission of the instructor.

**5300. Theory and Practice for Mathematics Teaching and Teacher Education. 3.** Advanced study of theory and research of mathematics teaching teacher education. Examines the scholarly basis for current rationales and practices, including a critical review of evidential effectiveness, core issues, and advocacies for reform. A major emphasis will include analysis and critique of significant theoretical and research literature. *Prerequisites:* enrollment in Mathematics Education Ph.D. program or permission of the instructor.

**5400. Analysis and Critique of Research in Mathematics Education. 3.** Both theoretical and empirical research and scholarship in the field of mathematics education are critically analyzed. Students develop a deep understanding of pivotal historical and contemporary literature that helped shape the field of mathematics education and begin a formative development of their research interests. *Prerequisites:* at least two from EMAT 5100, EMAT 5200, or EMAT 5300.

**5500. Colloquium in Mathematics Education. 1-3. (Max. 12).** Provides for a broad perspective on mathematics education through selected reading materials. Students present and discuss ideas and summaries of the assigned reading and, wherever possible, the student collects and uses original information from practical situations. Students participate with the selected materials (journal articles, research, manuscripts, conference presentations) for class discussion. *Prerequisite:* Graduate student status.

**5600. Quantitative Reasoning & Modeling in Mathematics and Science Education. 3.** Advanced study of theories, issues, research and practices for teaching and learning mathematics and science focused on quantitative reasoning and mathematical modeling (QRaMM). Analysis of fundamental constructs relevant to QRaMM in education. Activities engage the scholarship of critical analysis, and interdisciplinary applications aimed at student knowledge and expertise in QRaMM. *Prerequisite:* Graduate student status.

**5700. Principles and Methods for Integrated Teaching & Learning Mathematics & Science. 3.** Advanced study of theory, research, and practice for teaching and learning mathematics and science using integrated

approaches in curriculum, pedagogy, learning, and assessment. The course will be production oriented, with activities and developments aimed at stimulating and supporting manuscripts to be published in STEM-appropriate venues. *Prerequisite:* Graduate student status.

**5980. Dissertation Research. 1-12 (Max 12).** Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrolled in a graduate level degree program.

## Science Education (ESCI)

**5100. Science Education Research Colloquium. 1 (Max. 3).** The overarching goal of this graduate course is for Ph.D. students to be exposed to the most recent research methods, results, and implications of research on science education. *Prerequisite:* Graduate standing.

**5200. Contemporary Science Education Research. 3.** Develop a deep understanding of, and become conversant in, the current trends in research methodology and contemporary scholarly literature in science education research. *Prerequisite:* Graduate standing.

**5250. Cognition and Learning in Science and Math Education. 3.** Develop a deep understanding of, and become conversant in, the current learning sciences literature of cognition and learning focusing on how students learn science and mathematics. *Prerequisite:* Graduate standing.

**5600. History and Philosophy of Science and Mathematics Education. 3.** Focuses on key individuals, theories and events of the past century which have contributed to the formation of current views, ideas, theories, and practices in mathematics and science education. *Prerequisite:* Graduate student status.

**5630. Science Teacher Ed & K12 Professional Development. 3.** Addresses philosophies, research, theories and current issues related to pre-service science teacher education and in-service science teacher professional development. This course fulfills core requirements in the Science Education PhD program option. *Prerequisite:* Graduate student status.

## Department of Educational Studies

213 McWhinnie Hall, 766-3130

FAX: (307) 766-2018

Web site: [www.uwyo.edu/edstudies](http://www.uwyo.edu/edstudies)

Department Head: John Kambutu

### Professors:

**AUDREY KLEINSASSER**, B.A. Augustana College 1973; M.A. University of South Dakota 1989; Ph.D. University of Kansas 1988; Professor of Educational Studies 2000, 1988.

**ALLEN TRENT**, B.S. Eastern Kentucky University 1986; M.S. University of Dayton 1992; Ph.D. The Ohio State University 2000; Professor of Educational Studies 2012, 2000.

### Associate Professors:

**JEASIK CHO**, B.A. Taegu National University of Education 1991; M.Ed. Kyungpook National University 1993; Ph.D. The Ohio State University 2001; Associate Professor of Educational Studies 2009, 2003.

**ANGELAJAIME**, B.S. California State University, Sacramento 1995; M.A. San Francisco State University 1997; Ph.D. Purdue University 2005; Associate Professor of Educational Studies 2010, 2004.

**EDWARD JANAK**, B.S. Fredonia 1992; M.Ed. University of South Carolina 1996; Ph.D. 2003; Associate Professor of Educational Studies 2012, 2004.

**JOHN KAMBUTU**, B. A. University of Wyoming 1991; M. A. 1992; Ph.D. 1998; Associate Professor of Educational Studies 2008, 2003, 1999.

### Assistant Professor:

**JENNA SHIM**, B.A. California State University - Los Angeles 1994; M.M. Manhattan School of Music - New York 1996; M.S. State University of New York - Albany 2006; Ph.D. 2009; Assistant Professor of Educational Studies 2010.

### Assistant Lecturer:

**TERRY BURANT**, B.S. University of Wisconsin - Stevens Point 1981; M.E.-P.D. University of Wisconsin - La Crosse 1986; Ed.S. University of Arizona 1995; Assistant Lecturer of Educational Studies 2011.

Educational Studies encompasses curriculum designed to bring together courses offered in the academic areas of educational foundations (including introductory content in educational history, sociology, and policy), teaching and learning, assessment, multicultural education, and educational psychology (including developmental psychology). The department offers interdisciplinary, field-based



courses for those candidates in the first two phases of the teacher education program. The connection between course work, multicultural education, educational psychology, and teaching and learning, along with field-based experiences, has the structural effect of bridging the gap between theory and practice.

The courses offered by the department are linked with the state of Wyoming's Professional Education Standards. In addition to striving to meet the state standards, the faculty works to engage students on issues of leadership, literacy, multiculturalism/diversity, special education, and technology. Authentic assessments are key aspects of department courses. Educational Studies courses are guided by the Wyoming Teacher Education Program (WTEP) Standards. These standards (available at [www.uwyo.edu/ted/coe\\_standards.asp](http://www.uwyo.edu/ted/coe_standards.asp)) are aligned with the state Professional Education Standards and are assessed via a series of WTEP Learner Outcomes. Additional information about learner outcomes and the Wyoming Teacher Education Program Assessment Plan can be found at [ed.uwyo.edu/LearnerOutcomes.asp](http://ed.uwyo.edu/LearnerOutcomes.asp).

Masters and Doctoral degrees in education are available. The Educational Studies Department joins with the departments of Secondary Education and Elementary and Early Childhood Education to offer graduate programs in Curriculum and Instruction. Additional information may be found on the Curriculum and Instruction Department's web page ([www.uwyo.edu/c\\_i](http://www.uwyo.edu/c_i)).

## Educational Studies (EDST)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

**1101. First-Year Seminar. 3. [(none)♦♦FYS]**

**1230. The Citizen Factory: Schooling and Democracy in the US. 3. [I, L♦♦(none)].**

Introduction to active learning, inquiry of pressing issues, and individual and collaborative processing of ideas through the curriculum, skills which will be reinforced throughout the baccalaureate experience. Open to all, the course appeals to any student with an interest in the public schools or schooling for democracy.

**1500. Education for Social Justice. 3. [I,L♦♦(none)]** Provides an introduction to the College of Education, UW, and the field of education in general. Students discover the primary intellectual activities associated with

diversity, multiculturalism, and social justice. Will be of most interest to those interested in teaching as a career.

**2450 [EDFD 2450]. Foundations of Development and Learning. 3. [CS♦♦H]** Introduces students to the essential understandings of child/adolescent development and learning. The course emphasizes various theories and concepts related to student development with attention to cognitive, social, and physical perspectives. *Prerequisite:* 2.50 UW institutional GPA. (Offered each semester)

**2475. [EDUC 2475]. Independent Studies. 1-3 (Max. 9).** Offers students the opportunity to complete special course-related work independently under direction of a college faculty member. Directed readings are done and projects are completed. Requires at least two conferences with instructor. *Prerequisite:* consent of instructor.

**2480. Diversity and the Politics of Schooling. 4. [D♦♦H]** Designed to acquaint the student with philosophical, social, and political influences on North American education, to develop an understanding of the qualities of critical thinking, to raise awareness of critical issues in education, to develop an understanding of individual differences, diversity and multiculturalism. *Prerequisites:* Grade of C or better in EDST 2450, sophomore standing, 2.5 cumulative University of Wyoming institutional GPA, and successful completion of approved background check. (Offered each semester)

**3000 [EDUC 3000]. Teacher as Practitioner. 6. [WB,O♦♦COM2]** Begins Phase II of the teacher education sequence. Practicum experiences are integral. Links theory and philosophy to classroom practice. Focuses on three major topics: planning for educational experiences, instructional models and strategies, and managing classrooms. *Prerequisites:* successful completion of WA, grade of C or better in QA, 2.75 cumulative GPA, grade of C or better in EDST 2480, grade of C or better in ITEC 2360, grade of C or better in EDEX 2484, junior standing, current State of Wyoming substitute teaching license. (Offered each semester)

**3550. Educational Assessment. 2.** Designed to introduce students to key concepts and issues in classroom and standardized education assessments. Topics include standards, reliability and validity of norm- and criterion-referenced assessments, and special issues surrounding the assessment of students with special needs. Addresses the basic ideas of

classroom test design. *Prerequisites:* grade of C or better in QA course, and EDST 2480, 2.75 Cumulative UW Institutional GPA. (Offered each semester)

**4000. Foundations of Education for a Diverse Society. 3.** Designed to acquaint students with philosophical, social, and political influences of North American education; to develop an understanding of the qualities of critical thinking for reflective teaching; to raise awareness of contemporary critical issues in education; to develop an understanding of individual differences, diversity, and multiculturalism. Practicum included. *Prerequisites:* earned bachelor's degree from an accredited institution, a cumulative UW institutional GPA of 2.75 or better and EDST 2450.

**4050. Diversity & Social Justice: Theory and Practice. 3.** Addresses multiple disciplines. Expose students to domestic and international perspectives of diversity and social justice. This course will move students from a theoretical lens of diversity and social justice toward becoming change agents. *Prerequisites:* Junior/senior standing and completion of EDST 1500 or WMST/CHST/AMST/AAST/AIST 1040.

**4110. Foundations of American Indian Education. 3. [D♦♦(none)]** Examines cultural, geographical, linguistic, spiritual, political and societal factors before, during and after colonization of the Americas. Definitions and day-to-day realities of terms like ethnocentrism, cultural relativism, assimilation, acculturation, and institutional racism. Development of insights into positive teacher-pupil-community relationships that honor culture and language differences and enhance achievement. Cross listed with AIST 4110. *Prerequisites:* AIST 1001 and 15 credit hours of AIST or EDST.

**4600. Diversity & Social Justice Minor Capstone. 3-6 (Max. 6).** In community-engaged learning, sometimes called "service learning," students have the privilege of gaining work experience with the benefit of a community mentor. This course is a seminar class with a field experience. Students will meet as a group as well as assigned a community field placement experience. *Prerequisite:* EDST 4050.

**4740 [EDFD 4740]. Field Studies in \_\_\_\_\_. 1-5 (Max. 12).** Offered only through extension services. Broad and flexible; can be utilized in numerous situations to meet local needs. Credit in this course is not applicable toward advanced degrees. *Prerequisite:* 6 hours of education. (Offered based on sufficient demand and resources)

**4750 [EDUC 4750]. Perspectives on Teaching, 1-3 (Max. 6).** For undergraduate students selected to collaborate with UW faculty or professional staff in the delivery and sometimes the design of a university course, this course augments in-class experiences with an examination of basic learning and teaching principles. Offered for S/U only. *Prerequisites:* 3.0 GPA; consent of instructor.

## Department of Elementary and Early Childhood Education

313 McWhinnie Hall, 766-6366

FAX: (307) 766-2018

Web site: [www.uwyo.edu/eled](http://www.uwyo.edu/eled)

Department Head: Peter W. Moran

### Professors:

**MICHELLE BUCHANAN**, B.A. University of Utah 1974; M.Ed. University of Illinois 1976; Ph.D. University of Washington 1995; Professor of Elementary and Early Childhood Education 2011, 1997.

**JACQUELINE LEONARD**, B.A. Saint Louis University 1981; M.A.T. University of Texas, Dallas 1991; M.T.S. Southern Methodist University 1994; Ph.D. University of Maryland at College Park 1997. Professor of Elementary and Early Childhood Education 2012.

### Associate Professors:

**STEVEN M. BIALOSTOK**, B.A. University of the Pacific 1975; M.S.W. California State University—Sacramento 1986; Ph.D. University of Arizona 1999; Associate Professor of Elementary and Early Childhood Education 2005, 2000.

**ALAN R. BUSS**, B.A. Brigham Young University 1989; M.A. 1993; Ph.D. University of Wyoming 1998; Associate Professor of Elementary and Early Childhood Education 2003, 1997.

**SCOTT A. CHAMBERLIN**, B.A. Purdue University 1989 and 1993; M.Ed. University of Utah 1998; Ph.D. Purdue University 2002; Associate Professor of Elementary and Early Childhood Education 2009, 2003.

**TRICIA JOHNSON**, B.S. Lehigh University 1991; M.Ed. 1993; Ed.S. George Washington University 1997; Ed.D. Columbia University 2004; Associate Professor of Elementary and Early Childhood Education 2012.

**STEVEN LOCKE**, B.A. Indiana University 1985; M.S. Portland State University 1991; Ph.D. Indiana University 1997; Associate Professor of Elementary and Early Childhood Education 2005, 2001.

**SAMARA MADRID**, B.A. University of Hawaii at Hilo 1998; M.A. San Jose State University 2000; Ph.D. Ohio State University 2007; Associate Professor of Elementary and Early Childhood Education 2014, 2009.

**PATRICK MANYAK**, B.A. Pepperdine University 1988; M.S. 1990; Ph.D. University of Southern California—Los Angeles 2001; Associate Professor of Elementary and Early Childhood Education 2007, 2001.

**PETER WILLIAM MORAN**, B.A. University of Wyoming 1987; M.A. Kansas State University 1993; Ph.D. 2000; Associate Professor of Elementary and Early Childhood Education 2006, 2001.

**LYDIAH NGANGA**, B.S. University of Wyoming 1998; M.S. 2000; Ph.D. 2005; Associate Professor of Elementary and Early Childhood Education 2011, 2005.

**AMY ROBERTS**, B.S. Indiana University 1986; M.A. Portland State University 1991; Ph.D. Indiana University 1996; Associate Professor of Elementary and Early Childhood Education 2004, 1998.

**KATHERINE MUIR WELSH**, B.A. University of California—Berkeley 1986; Single Subject Teaching Credential (Life Sciences) University of California—Santa Barbara 1990; Ph.D. University of California—Los Angeles 2002; Associate Professor of Elementary and Early Childhood Education 2008, 2002.

### Assistant Professors:

**JENNIFER FORRESTER**, B.S. Western Carolina University 2002; M.A.T. University of North Carolina at Charlotte 2006; Ph.D. North Carolina State University, expected 2010; Assistant Professor of Elementary and Early Childhood Education 2012, 2010.

**TAO HAN**, B.A. Sungshin Women's University, Korea 1984; M.A. University of Arizona 1993; M.A. University of Nevada-Reno 2002; Ph.D. 2006; Assistant Professor of Elementary and Early Childhood Education 2012, 2010.

**ANA HOUSEAL**, B.A. University of Iowa 1985; M.A. University of Northern Iowa 1998; Ph.D. University of Illinois 2010; Assistant Professor of Elementary and Early Childhood Education 2011.

**TAMMY MIELKE**, B.S. Martin Luther College 1991; M.A. Eastern Michigan University 2002; Ph.D. Coventry University, UK 2007; Assistant Professor of Elementary and Early Childhood Education 2011.

**DANA ROBERTSON**, B.A. Berklee College of Music 1996; M.Ed. University of Massachusetts 2001; Ed.D. Boston University 2012; Assistant Professor of Elementary and Early Childhood Education 2012.

### Associate Lecturer:

**KIMBERLY MILLER**, B.A. University of Wyoming 1998; M.A. 2003; Ed.D. 2010; Associate Lecturer of Elementary and Early Childhood Education 2013, 2007.

**AMY SPIKER**, B.A. University of Wyoming 1989; M.A. 2004; Associate Lecturer of Elementary and Early Childhood Education 2013, 2007.

**DIANA L. WIIG**, B.A. University of Northern Iowa 1975; M.A. University of Wyoming 1990; Ph.D. 2004; Associate Lecturer of Elementary and Early Childhood Education.

### Assistant Lecturers:

**NIKKI BALDWIN**, B.A. University of Wyoming 1994; M.A. 2005; Assistant Lecturer of Elementary and Early Childhood Education 2012, 2009.

### Professors Emeritus:

Barbara A. Chatton, Margaret Cooney, Judith Z. Ellsworth, Patricia McClurg, R. Timothy Rush

### Early Childhood Education

The College of Education offers two certification programs in early childhood education: one at the undergraduate level for teachers serving children from birth to age eight and one at the graduate level serving children with special needs from birth through age five. In addition, undergraduate students in elementary education may choose early childhood education as an 18 hours area of concentration. All of the programs are interdisciplinary in nature, with course offerings available from four different colleges on campus: education, agriculture, arts and sciences, and health sciences. Specific advising in each of the early childhood options support students in their program development. The following courses are a partial list of the course offerings available. Master and Doctoral degrees in education are available. Additional information may be found in this catalog or on the department's web page.

### Early Childhood Education Minor

The minor consists of 22 credit hours including 9 hours of upper division credit. Of those 22 hours, students may include a maximum of 7 hours of early childhood course work that counts for both major and minor requirements.

It is recommended that students interested in obtaining the early childhood minor apply to the program by the freshman year or the be-

ginning of the sophomore year by completing the Change of Adviser, Major, Minor or Area of Concentration form.

Required courses (22 credits):

- EDEC 1020: Introduction to Early Childhood Education (3 credits)
- FCSC 2121: Child Development (4 credits) or PSYC 2300 and FCSC 2122 (4 credits)
- EDEC 2000: Engaging Families in Early Childhood Settings (3 credits)
- EDEC 3000: Observing Young Children (3 credits)
- EDEC 3220: School Programs for Young Children (3 credits)
- EDEC 4320: Oral and Written Language Acquisition (3 credits)

One elective from the list below\*:

- EDEL 2280: Literature for Children (3 credits)
- FCSC 2131: Family Relationships (3 credits)
- FCSC 3119: Parent-Child Relationships (3 credits)
- FCSC 3129: Social Development in Young Children (3 credits)
- FCSC 3220: Multicultural Influences on Children and Families (3 credits)
- FCSC 4124: Families of Young Children with Special Needs (3 credits)
- FCSC 4127: Directing Preschool & Daycare Programs (3 credits)
- EDCI 4140: Storytelling (3 credits)
- EDEC 4350: Health Management Issues in Early Childhood Special Education (3 credits)
- EDEC 5210: Seminar in Early Childhood Education (3 credits)
- EDEC 5220: Children with Disabilities: Birth to Five (3 credits)
- SPPA 2110: American Sign Language I & II (4 credits)

\*Students may petition other early childhood electives.

## Elementary Education (EDEL)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**1000. Exploring Hot Topics in Education. 2. [I♦(none)]** Academic, content-based course designed for first year students. Focuses on critical-thinking skills necessary to understand, analyze, and produce knowledge within the framework of educational inquiry.

**1010 [EDCI 1010]. Field Experience for Prospective Elementary and Secondary Teachers. 1-4 (Max. 4).** Introductory course in teacher education. Provides an overview of the theory and practice of what is required to become and be a teacher. An initial practicum is included. Cross listed with EDSE 1010. *Prerequisite:* sophomore standing. (Offered based on sufficient demand and resources)

**1410. [EDCI 1410]. Elementary School Mathematics Seminar I. 1.** Covers selection of basic mathematics concepts, materials and curricula appropriate for elementary schools. This course parallels the content of MATH 1100 and should be taken during the same semester. Experiences in assigned mentor teacher classrooms are required. *Prerequisite:* consent of instructor. (Offered fall and spring semesters)

**1430. [EDCI 1430]. Life Science in the Elementary School. 1.** Covers selection of basic life science concepts, materials and curricula appropriate for elementary school. This course parallels the content of LIFE 1020 and concurrent enrollment in LIFE 1020 is expected. (Offered fall and spring semesters)

**1440. [EDCI 1440]. Physical Science in the Elementary School. 1.** Covers selection of basic physical science concepts, materials and curricula appropriate for elementary school. This course parallels the content of PHYS 1090 and concurrent enrollment in PHYS 1090 is expected. (Offered fall and spring semesters)

**1450. [EDCI 1450]. Earth Science in the Elementary School. 1.** Covers selection of basic earth science concepts, materials, and curricula appropriate for elementary school. This course parallels the content of ASTR/GEOL 1070 and concurrent enrollment in ASTR/GEOL 1070 is expected. (Offered fall and spring semesters)

**2140. Teaching Literacy in the Elementary School. 3.** Provides an acquaintance with basic assumptions underlying curriculum and processes in literacy and to give opportunity for selecting and using instructional materials. *Prerequisites:* ENGL 1010, sophomore standing, admitted into Elementary Education program.

**2000 [EDCI 2000]. Undergraduate Seminar in \_\_\_\_\_. 1-2 (Max. 8).** Designed to discuss strategies and instructional activities used in content courses the students take and to be a linkage between what the prospective teachers study and what they will teach. It provides the opportunity to discuss appropriate activities, strategies and programs in a teaching area related to the content area being studied. Cross

listed with EDSE 2000. *Prerequisite:* consent of instructor. (Offered based on sufficient demand and resources)

**2275. Literature for Young Children. 3. [CH♦(none)]** Introduce major genres and conventions. Will develop critical skills for reading and writing about children's literature and culture; interpretive skills to enrich the understanding of literature for readers 0-7 years of age; and develop an awareness of shifts in children's literature for early readers. *Prerequisite:* ENGL 1010 and sophomore standing.

**2280 [LIBS 2280]. Literature for Children. 3. [CH♦H]** A survey course, the purpose of which is to prepare prospective elementary teachers and library-media specialists to provide knowledgeable service in the use of print and non-print materials for children. Includes study of evaluative criteria, wide reading, viewing and listening as well as discussion of literature for children. *Prerequisite:* successful completion of ENGL 1010, sophomore standing, education major. (Offered fall and spring semesters)

**2410. [EDEL 1420, EDCI 1420]. Elementary School Mathematics Seminar II. 1.** Covers selection of basic mathematics concepts, materials and curricula appropriate for elementary schools. Parallels the content of MATH 2120 and concurrent enrollment in MATH 2120 is expected. *Prerequisite:* consent of instructor. (Offered fall and spring semesters)

**3140 [EDCI 3140]. Teaching Reading in the Elementary School. 2-4 (Max. 4).** Provides an acquaintance with basic assumptions underlying curriculum and processes in reading and to give opportunity for selecting and using instructional materials. *Prerequisites:* junior standing, 2.5 minimum cumulative GPA, satisfactory completion of WA requirements, committee approval. (Offered based on sufficient demand and resources)

**3170 [EDCI 3170]. Art in the Elementary School. 3. [CA♦(none)]** Provides a foundation for understanding art in order to facilitate the teaching of art and the integration of art education into the elementary school curriculum. Involves both applied reading and studio production. Attention is given to development of artistic skills and meaningful art experiences based on DBAE principles. *Prerequisites:* junior classification, 2.5 minimum cumulative GPA. (Offered fall, spring and summer)

**3550 [EDCI 3550]. Methods of Teaching: \_\_\_\_\_. 2-5 (Max. 10).** Develops an understanding of methods common to all disciplines. Through reflective inquiry and problem solving students will become involved

in teaching practices and techniques. Cross listed with EDSE 3550. *Prerequisites:* EDST 3000, junior class standing, 2.5 minimum cumulative GPA, must maintain grade of C or better in major. (Offered based on sufficient demand and resources)

**3710. Disciplinary/Genre-Based Literacy. 3.** Introduction to instruction in genre-specific and disciplinary appropriate literacy practices, with a focus on characteristics of a variety of genres and disciplines and how those characteristics inform appropriate comprehension instruction. *Prerequisite:* EDEL 2140.

**3720. Literacy Difficulties: Assessment and Instruction. 3.** Focuses on the causes of student difficulties with reading and writing and assessment and instruction for students with such difficulties. *Prerequisite:* EDEL 2140.

**4000 [EDUC 4000]. Becoming a Reflective Practitioner: Practicum. 2.** Part of Phase IIIa of the teacher education program. Practicum experience is integral to EDUC 4250 and must be taken concurrently. Cross listed with EDSE 4000. *Prerequisites:* 2.5 cumulative GPA, successful completion of EDST 3000 (grade, interview and portfolio).

**4109 [EDUC 4109]. Elementary Humanities Education. 5.** Content and pedagogy to develop the reflective practitioner of teaching humanities in the elementary school. The following themes are addressed: curriculum; theory translated into instructional planning and practice; practices that promote effective learning; behavior and relationships; and teaching strategies. *Prerequisites:* 2.75 cumulative GPA; 2.5 content GPA; grade of C or better in EDST 3000; successful completion of specific content courses required in major; grade of C or better in EDST 3550; concurrent enrollment in EDEL 4309 and EDEL 4409.

**4309 [EDUC 4309]. Elementary Literacy Education. 2-5 (Max. 6).** Encompasses content and pedagogy to develop the reflective practitioner for teaching literacy in the elementary school. Addresses the following themes: curriculum; theory translated into instructional planning and practice; practices that promote effective learning; behavior and relationships; and teaching strategies. *Prerequisites:* 2.75 cumulative GPA; 2.5 content GPA; Grade C or better in EDST3000, successful completion of specific content courses required in major; grade C or better in EDST3550. Concurrent enrollment in EDEL 4109 and EDEL 4409.

**4409 [EDUC 4409]. Elementary Math/Science Education. 5-6 (Max. 6).** [WC♦(none)] Includes content and pedagogy in teaching math/science in the elementary school. Addresses the following themes: cur-

riculum; theory translated into instructional planning and practice; practices that promote effective learning; behavior and relationships; and teaching strategies. *Prerequisites:* 2.75 cumulative GPA; 2.5 content GPA; grade of C or better in EDST 3000; successful completion of specific content courses required in major; grade of C or better in EDST 3550; concurrent enrollment in EDEL 4109 and EDEL 4309.

**4500 [EDUC 4500]. Residency in Teaching. 1-16 (Max. 24).** Comprises the final professional academic semester of the teacher education program. A full-time residency, including a period of being intensively mentored and coached, a period of independent teaching and a period of team teaching. Available for S/U only. Cross listed with EDSE 4500 and EDEX 4500. *Prerequisites:* 2.75 cumulative GPA, 2.5 GPA in major content courses, completion of all content courses, successful completion of Phase IIIa specific pedagogy and practicum, complete review of the prospective teacher's record.

**4740 [EDCI 4740]. Field Studies in \_\_\_\_\_. 1-12 (Max. 45).** Offered only through extension services. Broad and flexible and can be utilized in numerous situations to meet local needs. Credit in this course is not applicable toward advanced degrees. Cross listed with EDEL 4740. Offered S/U only. *Prerequisite:* 6 hours of education. (Offered based on sufficient demand and resources)

**4975. [EDCI 4975] Independent Study. 1-3 (Max. 6).** Primarily for upper-division students who can benefit from independent study with minimal supervision. Given to allow interested students to pursue specific aspects of curriculum and instruction. Cross listed with EDSE 4975. *Prerequisites:* 12 hours of education courses and consent of instructor.

## Early Childhood

The College of Education offers two certification programs in early childhood education: one at the undergraduate level for teachers serving children from birth to age eight and one at the graduate level serving children with special needs from birth through age five. In addition, undergraduate students in elementary education may choose early childhood education as an 18 hour area of concentration. All of the programs are interdisciplinary in nature, with course offerings available from four different colleges on campus: education, agriculture, arts and sciences and health sciences. Specific advising in each of the early childhood options support students in their program development. The following courses are a partial list of the course offerings avail-

able. Masters and Doctoral degrees in education are available. Additional information may be found on the department's webpage.

## Early Childhood (EDEC)

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).**

**1020 [EDCI 1020]. Introduction to Early Childhood Education. 3.** Introduces students to the field of early childhood education through lecture, discussion, observation and participation. The student will be exposed to different programs currently in operation in the community and region. Special emphasis will be placed on evaluating early childhood education as a career.

**1101. First-Year Seminar. 3. [(none)♦FYS]**  
**2000. Engaging Families in Early Childhood Settings. 3.** Focus on the philosophical, psychological, and sociocultural aspects of working with families and children in early childhood educational, home, and community settings.

**3000. Observing Young Children. 3.** The general goal of the course is to introduce students to observation and recording techniques appropriate for assessing the growth and development of young children in the school setting. A secondary goal is to understand how observation and recording techniques can facilitate curriculum planning and parent-teacher conferences. *Prerequisites:* EDEC 1020 and FCSC 2121.

**3210 [EDCI 3210]. Program and Curriculum Development for Young Children. 2-3 (Max. 3).** Provides an overview of early childhood education curriculum and the development of early childhood programs. Emphasis is placed on the development of a balanced early childhood curriculum. *Prerequisites:* EDEC 1020, 3000 and FCSC 2121.

**3220 [EDCI 3220]. School Program for Young Children. 3.** Describes, identifies, and examines programs and best practices of teaching young children in school settings. Lecture and discussion are supported by a two hour practicum in an early childhood school setting. *Prerequisites:* EDEC 1020 and FCSC 2121.

**4320 [EDCI 4320]. Oral and Written Language Acquisition. 3.** Introduces the student to the nature of language development as it pertains to oral and written communication in education. Recent research in the areas of oral and written language acquisition is compared and contrasted. Implications for facilitating the development of all language modes in

educational settings is emphasized. *Prerequisites:* EDST 2480 or equivalent, junior standing and declared Elementary Education or Family and Consumer Sciences major.

**4350. Health Management Issues in Early Education. 3.** Provides the student the opportunity to examine the implications of a child's health status on his/her personal, educational, social and cognitive development. Provides personnel working closely with the young child with disabilities and his/her family an understanding of the issues related to health concerns and a framework for intervention planning. Special emphasis is placed on concerns specific to the child in a day care, preschool or other school setting. Cross listed with NURS 4350. *Prerequisites:* junior standing and consent of the instructor.

## Department of Professional Studies

332 Education Building, 766-2366  
and

316 Education Building, 766-5649

FAX: (307) 766-5638

Web site: [www.uwyo.edu/profstudies](http://www.uwyo.edu/profstudies)

Department Head: Mary Alice Bruce

The Department of Professional Studies includes the following program areas: Adult and Post Secondary Education, Counseling, Leadership, Research, Instructional Technology and Special Education.

### Professors:

**MARTIN AGRAN**, B.A. City College of New York 1969; M.A. University of Rochester 1971; M.S. Oregon College of Education 1974; Ph.D. University of Illinois 1982; Professor of Special Education 2005.

**MARY ALICE BRUCE**, B.S. Purdue University 1971; M.S. Iowa State University 1989; Ph.D. 1991; Professor of Counselor Education 2007, 1991.

**KAY PERSICHITTE**, B.A. University of Northern Colorado 1975; M.Ed. Colorado State University 1985; Ph.D. University of Northern Colorado 1993; Professor of Educational Studies 2003.

**JOHN STELLERN**, B.A. University of California Berkeley 1955; M.A. California State University Los Angeles 1961; Ed.D. University of Northern Colorado 1966; Professor of Special Education 1973, 1969.

**SUZANNE YOUNG**, B.S. Metropolitan State College 1978; M.S. University of Northern Colorado 1990; Ph.D. 1995; Professor of Educational Research 2007, 1996.

### Associate Professors:

**DORIS BOLLIGER**, B.S. Park University 1991; M.A. Bowie State University 1995; Ed.D. University of West Florida 2002; Associate Professor of Instructional Technology 2012, 2006.

**CLIFFORD P. HARBOUR**, B.A. Rhode Island College 1978; J.D. Ohio Northern University 1981; M.A. Duke University 1987; Ed.D. North Carolina State University 2000; Associate Professor of Adult Education 2008.

**DEBORAH MCGRIF**, B.S. University of Nebraska—Lincoln 1976; M.S.W. University of Nebraska—Omaha 1981; Ph.D. University of Wyoming 1999; Associate Professor of Counselor Education 2009, 2002.

**MICHAEL M. MORGAN**, B.S. Brigham Young University 1993; M.S. Auburn University 1995; Ph.D. Purdue University 2003; Associate Professor of Counselor Education 2011, 2003.

**QI SUN**, B.A. Harbin Teacher College 1984; M.Ed. Beijing Normal University 1990; Ed.D. Northern Illinois University 2001; Associate Professor of Adult Education 2009, 2002.

**JANE WARREN**, B.A. University of Wyoming 1974; M.A. 1979; Ph.D. 1987; Associate Professor of Counselor Education 2014, 2007.

**DOROTHY JEAN YOCOM**, B.A. Whitworth College 1978; M.S. University of Oregon 1980; Ph.D. Oregon State University 1991; Associate Professor of Special Education 1997, 1991.

### Assistant Professors:

**KARA L. CARNES-HOLT**, B.A. East Texas Baptist University 2000; M.S. Ed. Baylor University 2003; Ph.D. University of North Texas 2010; Assistant Professor of Counselor Education 2012, 2010.

**TONIA A. DOUSAY**, B.S. Texas A&M University 1999; M.S. 2000; Ph.D. University of Georgia 2013. Assistant Professor of Instructional Technology 2013.

**COURTNEY McKIM**, B.S. Boise State University 2006; Ph.D. University of Nebraska 2011; Assistant Professor of Educational Research 2011.

**DAVID HVIDSTON**, B.S.Ed. University of North Dakota 1979; M.A. University of Wyoming 1988; Ed.D. 2002; Assistant Professor of Educational Leadership 2011.

**CRAIG SHEPHERD**, B.S. Brigham Young University 2002; Ph.D. University of Georgia 2008; Assistant Professor of Instructional Technology 2012, 2008.

**ERIC D. TEMAN**, B.S. University of Northern Colorado; M.S. 2006; Ph.D. 2012; J.D. University of Denver 2008; Assistant Professor of Educational Research 2014.

### Assistant Professional Lecturer

**TIFFANY DOBLER**, B.S. University of Wyoming 2001; M.S. University of Northern Colorado 2006; Ph.D. 2015; Assistant Professional Lecturer of Special Education 2014.

## Program Areas

### Counseling

Counselor education curricula experiences concentrate on the integration of helping skills, theory and practice. The programs utilize a personalized, developmentally oriented focus and prepare professional counselors for entry into school, mental health, and higher education settings.

The undergraduate counseling courses are designed to achieve the following objectives:

- enhance self-awareness
- facilitate effective relationship skills
- increase leadership knowledge and skills
- assist learners in maximizing their potential

### Graduate Study

Counselor education offers a two-year (61-65 semester hours) master's degree program for practice in schools, colleges, universities, and community agencies. The Council for Accreditation of Counseling and Related Educational Programs (CACREP), the national accrediting body recognized by the Council for Higher Education Accreditation, has conferred accreditation to the following M.S. specializations in counseling: school counseling and mental health counseling. The Ph.D. program in Counselor Education and Supervision is also CACREP accredited. Some courses are offered for undergraduates interested in school counseling, group work, leadership, and student affairs work. Undergraduates interested in preparing for entry into graduate work in counseling are invited to consult with program faculty prior to graduation. Program information is available on the Web site.

### Degrees Offered

- M.S. in Counseling, Option:  
Mental Health Counseling
- M.S. in Counseling, Option:  
School Counseling
- Ph.D. in Counselor Education  
and Supervision

**Program Specific Admission Requirements**

*For master's applicants:*

- Summary of academic background
- Professional resume
- Self-statement
- Three letters of recommendation

*For doctoral applicants:*

- Professional resume
- Self-statement
- Program information form
- Three letters of recommendation

Prior to full admission, all students are required to complete a background check.

**Program Specific Graduate Assistantships**

Assistantships are usually available for doctoral students. Master's students sometimes qualify for assistantships. Please contact the program at (307) 766-2366 for assistantship opportunities, and see department web site.

**Program Specific Degree Requirements**

*Professional Master's Program*

- Minimum requirements:
  - same for all options
  - 61 hours of graduate credit to include
    - 40 hours of core courses and 21 hours of graduate coursework specific to chosen option
  - Culminating internship activity guided by faculty advisor
  - Students complete the CAPP program in lieu of a program of study

**Program Requirements**

*Core Courses*

CNSL 5060 Counseling Ethics and Professional Issues .....	3
CNSL 5110 Group Procedures.....	3
CNSL 5140 Counseling and Addictions.....	3
CNSL 5170 Career Across the Lifespan.....	3
CNSL 5175 Human Growth and Development.....	3
CNSL 5180 Assessment in Counseling .....	3
CNSL 5200 Couples & Family Theory & Application .....	3
CNSL 5210 Group Experience .....	1
CNSL 5310 Pre-Practicum in Counseling .....	3
CNSL 5320 Practicum in Counseling.....	3
CNSL 5330 Counseling Children and Adolescents.....	3
CNSL 5340 Play Therapy.....	3
CNSL 5350 Multicultural Counseling .....	3
EDRE 5610 Advanced Practice in Group and Family Counseling .....	3
CNSL 5640 Diagnosis, Psychopathology, & Psychopharmacology.....	3

CNSL 5650 Counseling Theories.....	3
EDRE 5530 Introduction to Research.....	3
<b>Core Subtotal</b>	<b>49</b>

*School Counseling*

CNSL 5120 School Counseling Strategies and Techniques.....	3
CNSL 5125 School Counseling II.....	3
CNSL 5580 Supervised Internship.....	6
<b>Subtotal</b>	<b>12</b>

*Mental Health Counseling*

CNSL 5130 Mental Health Counseling.....	3
CNSL 5150 Mental Health Counseling II.....	3
CNSL 5580 Supervised Internship.....	6
<b>Subtotal</b>	<b>12</b>

**Minimum Total Credit Hours .....61**

**Program Core Requirements:**

*Core Courses*

**Doctor of Philosophy in Counselor Education and Supervision**

Doctoral students are required to have completed a minimum of a 48-hour Master's degree from a program of study equivalent to a CACREP accredited Masters program in Counselor Education. These requirements are based upon the 2009 CACREP Standards.

**Learning Outcome Areas**

**Advanced Foundations**

Ph.D. students with a 48-hour CACREP equivalent Master's degree are required to complete 12 semester hours of courses beyond their Master's preparation (in consultation with their adviser and committee). Ph.D. students with a 60-hour CACREP equivalent Master's program can petition up to 12 hours of their Master's coursework to fulfill this requirement.

**Counseling and Supervision**

CNSL 5860 Doctorate Practicum in Counseling .....	6
CNSL 5865 Supervision Theory.....	3
CNSL 5875 Doctorate Practicum in Supervision .....	3

**Teaching, Leadership and Advocacy**

CNSL 5871 Doctoral Seminar I .....	3
CNSL 5872 Doctoral Seminar II.....	3
CNSL 5873 Doctoral Seminar III.....	3
CNSL 5874 Doctoral Seminar IV .....	3
CNSL 5900 Practicum in College Teaching.....	3
CNSL 5990 Internship .....	6

**Research and Scholarship**

12 credits chosen from the following (or equivalent) in consultation with major adviser and graduate committee.

EDRE 5600 Descriptive Research.....	3
EDRE 5610 Group Comp. Research.....	3
EDRE 5620 Correlational Research.....	3
EDRE 5630 Multivariate Research.....	3

EDRE 5640 Intro to Qual Research.....	3
EDRE 5650 Adv. Qual Research .....	3
EDRE 5670 Mixed Methods Research .....	3

**Dissertation**

EDRE 5660 Dissertation/Thesis Prospectus Writing .....	3
PRST 5890 Dissertation Research .....	12
<b>Total</b>	<b>72</b>

**Learner Outcomes**

*Master's Degree in Counseling*

At the completion of the Master's degree in Counseling students will demonstrate the following learner outcomes:

1. Professional Competence & Academic Preparation for Licensed Professional Counselor (LPC): Students will demonstrate academic preparation by developing and completing an approved program of study that meets the standards set forth by the Council for Accreditation of Counseling and Related Educational Programs (CACREP).
2. Democratic Perspectives: Students will demonstrate development as a culturally competent, creative, skilled & ethical counselor.
3. Professional Identity: Students will develop a professional identity as a professional counselor including the areas of advocacy, leadership, social justice, and promoting caring communities.
4. Academic & Professional Goals: Students will demonstrate a clear vision of their professional and academic goals.

*Ph.D. in Counselor Education & Supervision*

Doctoral students in Counselor Education & Supervision will demonstrate the following learner outcomes through the development of a professional e-portfolio (<https://sites.google.com/site/phdeportfolio/Home>) that is presented and reviewed on an annual basis.

1. Academic & Professional Goals: Students will demonstrate a clear vision of their professional and academic goals and academic preparation by developing and completing an approved program of study that meets the standards set forth by the Council for Accreditation of Counseling and Related Educational Programs (CACREP).
2. Professional Licensure: Students will obtain professional licensure as a Licensed Professional Counselor (LPC) in the state of Wyoming and/or develop a plan to obtain licensure for the state in which they intend to relocate upon graduation.

3. Democratic Perspectives: Students will demonstrate development as a culturally competent, creative, skilled & ethical counselor, supervisor and educator including the areas of advocacy, leadership, social justice, and promoting caring communities.
4. Research & Scholarship: Students will develop a professional identity as an academic researcher by demonstrating a clear and active research agenda that includes a plan of action for professional presentations and manuscripts.
5. Professional Development: Students will develop a clear and diligent plan to becoming a skilled, ethically competent counselor educator.

## Counseling (CNSL)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

**1000. Relationship Skills: Counseling in Action. 3. [I,L♦♦(none)]** Content-based course that focuses on the critical-thinking skills necessary to understand, analyze, and produce knowledge within the framework of educational inquiry; introducing students to the role of counseling in diverse settings. Themes discussed include classroom human relations skills, counseling in a diverse society, legal and ethical issues in human relations fields, and various specialties in the practice of counseling.

**1101. First-Year Seminar. 3. [(none)♦♦FYS]**  
**2200. Introduction to Student Leadership. 2. [CS,L♦♦(none)]** Acquaints student leaders with skills and competencies necessary for successful service in the university community. (Normally offered each fall semester)

**2300. Counseling Skills for the Helping Professions. 3.** Presents instruction and practice in basic counseling and communication skills. Emphasizes listening, responding, encouraging and initiating change in interpersonal communication through mediation and conflict resolution. *Prerequisites:* sophomore standing; permission of Coordinator of Counselor Education program.

**2800. Undergraduate Seminar in: \_\_. 1-3 (Max. 9).** Reserved for academic course work related to student interest in classes associated with examining the discipline of counseling from many varied perspectives. *Prerequisite:* Declared major in the social sciences, human services, or education.

**3010. Student Leadership Strategies. 2.** Develops skills and competencies requisite to effective leadership. Provides student leaders with skills they will profit from, both while enrolled at the university and later in their chosen careers. (Normally offered each spring semester)

**4040. Interpersonal Relationship Skills. 3.** Designed to help students and administrators develop their human relation skills to improve interpersonal effectiveness and communication as related to generic life skills. Dual listed with CNSL 5040. *Prerequisites:* 12 hours in education/psychology.

**4410. Elementary and Middle School Guidance. 2.** Primarily for teachers, teachers-in-training, administrators, and other educators. Covers individual and group guidance and counseling strategies in the elementary and middle school. Emphasizes the role of teachers and other educators in providing guidance, counseling and experiences for children to promote their social, emotional and psychological growth. Dual listed with CNSL 5410. *Prerequisites:* junior standing; 6 hours of education and/or behavioral sciences and graduate standing to receive graduate credit.

**4520. Fundamentals of Counseling (B) 3.** Students learn some of the skills of counseling and develop an understanding of elementary principles of counseling theory, as well as a better understanding of themselves in relation to other people. Dual listed with CNSL 5520. *Prerequisites:* junior standing; 6 hours of education or psychology and graduate standing to receive graduate credit. (Offered on campus and online all semesters)

**4620. Organization and Administration in Student Affairs. 3.** An introduction to college student affairs practice, specifically exploring issues related to the organization and administration of student personnel services. Explores the history, the philosophy, and the skills utilized in student personnel services within the context of various higher education institutions and settings. Dual listed with CNSL 5620. *Prerequisite:* department consent.

**5010. Introduction to Addictions. 2.** Introduces students to the many faces of addictions by providing a general overview of the impact alcohol, drugs, and other addictions issues have on individuals seeking counseling. *Prerequisite:* graduate standing.

**5020. Workshop. 1-4 (Max. 99).** Usually offered only during summer sessions, this course provides an opportunity for special consideration on particular areas of counseling or pupil personnel services. *Prerequisite:* graduate standing, nine hours of education or behavioral science.

**5030. Short Course. 1-2 (Max. 12).** Provides opportunities for intensive study of some specific topic or set of topics in personnel work, to meet the special needs of a group of students with common interests. No more than six hours may be applied to any one degree program. *Prerequisite:* graduate standing and 6 hours in education and/or behavioral sciences.

**5040. Relationship Skills. 3.** Designed to help students and administrators develop their human relation skills to improve interpersonal effectiveness and communication as related to generic life skills. Dual listed with CNSL 4040. *Prerequisite:* 12 hours of education and/or psychology.

**5060. Counseling Ethics and Professional Issues. 3.** Designed to provide students with a philosophical base for making ethical decisions in the professional situations they encounter. In addition, it involves a chance to discuss many specific ethical and professional issues that are commonly encountered in the profession. *Prerequisite:* program admission or consent of instructor.

**5100. Addictions and Diversity. 3.** Focuses on increasing students' understanding of diversity issues in the prevention and treatment of alcohol, drug abuse, and other addictions. *Prerequisite:* six hours in administration of justice, psychology, sociology, or social work at the 4000 or 5000 level.

**5110. Group Procedures. 3.** Designed as an introduction to group work used in various organizational settings. Basic group techniques and procedures are covered using lecture/discussion methods, video, observation, and participation in practicing group leadership skills. Participation in a group experience during the course is required. *Prerequisites:* CNSL 4520/5520, six semester hours of education and/or psychology, consent of instructor, and graduate standing.

**5120. School Counseling. 3.** Provides specialized training for individuals preparing to be school counselors at levels K-12. *Prerequisite:* graduate standing.

**5125. School Counseling II. 3.** Explores the leadership role of the professional school counselor within the P-12 school setting and focuses on skills and experiences related to equity, advocacy, and social justice for systemic change, as well as program development, implementation and evaluation. *Prerequisites:* Graduate standing, program admission and CNSL 5120.

**5130. Mental Health Counseling. 3.** Encompasses specific counseling and professional development issues encountered by licensed counselors working in mental health agencies or private practice. Understanding the nature

of the clientele and the issues, strategies for resolving client difficulties, collaborative practice, ethics, advocacy, knowledge and skills related to diversity and social justice are considered. *Prerequisites:* enrollment in Counselor Education program, successful completion or enrollment in CNSL 5060, 5650 and 5310.

**5140. Counseling & Addictions. 3.** Focuses on students acquiring specialized knowledge of assessment and multi-disciplinary treatment of chemical and other addictions. *Prerequisite:* six hours in administration of justice, psychology, sociology, or social work at the 4000 or 5000 level.

**5145. Dual Diagnosis: Counseling Implications. 3.** Designed to prepare counselors to assess, diagnose, and treat co-morbid substance abuse/dependence and other Axis 1 mental health problems for persons seeking counseling. Offered satisfactory/unsatisfactory only. *Prerequisite:* graduate standing or mental health practitioner.

**5150. Mental Health Counseling II. 3.** Explores the leadership role of the professional counselor within a variety of mental health settings. Areas of application include program development, best practices, management, evaluation, consultation, social justice and supporting client advocacy. *Prerequisites:* graduate standing, program admission and CNSL 5130.

**5160. Etiology of Alcohol and Drug Dependency. 3.** An introduction to issues pertaining to the etiology of alcohol and drug dependency. Emphasis is on genetic, psychological and sociocultural causes of chemical addiction. Cross listed with PSYC 5160. *Prerequisite:* PSYC 2210, CNSL 4520/5520 or equivalent.

**5170. Career Lifespan. 3.** Offers an overview of human lifespan functioning with a primary focus on psychosocial development and counseling and career development across the lifespan. Additionally, this course presents the opportunity to examine the role of career and its influences on personal development.

**5175. Human Growth and Development. 3.** Provides an understanding of the nature and needs of individuals at all developmental levels, across the entire lifespan, and in diverse multicultural contexts through addressing theories of individual and family development, transitions across the life span, theories of learning, personality development, and neurobiological behavior. *Prerequisites:* Instructor permission and bachelors degree.

**5180. Assessment in CNSL. 3.** Emphasis is on counselor development for facilitating client self-understanding through the application of various assessment procedures and knowl-

edge about educational information systems and tools. *Prerequisite:* graduate standing, 15 hours in education and/or behavioral sciences.

**5200. Couple and Family Theory. 3.** Provides students with a foundation in conceptualizing and working with couple and family systems. Areas to be addressed include the history of couple and family counseling, ethical issues, professional orientation and an introduction to major systems theories. Participants are expected to explore their own family of origin. *Prerequisite:* admission to program.

**5210. Group Experience. 1.** Designed to provide a structured growth group experience through both in-class experience and reading. It is designed for students involved in human relationship fields. In-class groups are led by advanced group counseling students under the supervision of the faculty instructor. *Prerequisites:* graduate standing and consent of instructor.

**5250. Theories of Student Development. 3.** Philosophical views, theories and models for the design, structuring and development of comprehensive programs of college student personnel services are investigated. Roles, functions and contributions are studied as are institutions context and environment in which student personnel services function. *Prerequisite:* graduate standing or permission of instructor.

**5300. Couple and Family Ethics. 1.** Provides in-depth exploration of ethical issues in working with couples and family systems. Designed to complement 5060 which provides a foundation in ethics. *Prerequisite:* graduate standing.

**5310. Pre-Practicum. 3.** The first semester of a one-year sequence focused on learning, developing and practicing the fundamental process of counseling. Students do role-playing and have supervised experience with clients in a laboratory setting. Individual supervision is provided. Individual, live and observation of supervision is extensive. *Prerequisite:* graduate standing, program approval.

**5320. Practicum. 3.** Second course in a two semester sequence which includes class work, supervised counseling with clients in laboratory, extensive individual, group, live and observational supervision. *Prerequisites:* graduate standing, CNSL 5310, program approval.

**5330. Counseling Children and Adolescents. 3.** Students increase knowledge and skills in the processes of counseling children and adolescents. *Prerequisite:* six hours in education and/or behavioral sciences.

**5340. Play Therapy. 3.** Provides students with an overview of the field of play therapy. The historical roots of play therapy and the importance of play in child development will

be explored. Various play therapy theories and techniques for assessment and intervention and professional issues will be surveyed. *Prerequisite:* graduate standing or consent of instructor.

**5350. Multicultural Counseling. 3.** Increases counselor competency and skills with diverse clients. *Prerequisite:* admission to the UW counseling program.

**5400. Advanced Methods in Couple and Family Therapy. 3.** Provides advanced training in couple and family counseling, with an emphasis on the linkage between prominent systemic and non-systemic theories/models and relevant, effective and innovative intervention techniques. Serves as a link between theory (CNSL 5200) and practice (CNSL 5600). *Prerequisites:* graduate standing and CNSL 5200.

**5410. Elementary and Middle School Guidance. 2.** An introduction primarily for teachers, teachers-in-training and counselors, covering individual and group guidance and counseling techniques in the elementary and middle school. Emphasis is placed on the role of teachers and counselors in providing guidance, counseling, and experiences for children to promote their social, emotional, and psychological growth. Dual listed with CNSL 4410. *Prerequisites:* 6 hours of education and/or behavioral sciences and graduate standing.

**5490. Individual Problems. 1-6 (Max. 6).** Provides flexible credit for students who wish to undertake intensive study of a special problem identified in a regular classroom or area of study not currently covered by a regular class. *Prerequisites:* consent of instructor and department, and graduate standing.

**5500. Couples and Marriage Therapy. 3.** Provides participants with knowledge and skills specific to working with couples and partners in the areas of relationship and marital therapy. A variety of methods are used to support participants in becoming more effective in working with both "traditional" and "non-traditional" relationships in addressing issues of intimacy. *Prerequisite:* CNSL 5200.

**5510. Trends and Issues. 1-4 (Max. 4).** This course is used from time to time as a systematic means for students to explore a developing trend or issue related to personnel services. Students make in-depth studies of one or more issues, trends, practices, and applications, under the supervision of one or more instructors. *Prerequisite:* graduate standing, and 15 hours in education and/or behavioral sciences.

**5520. Fundamentals of Counseling. 3.** Beginning course in the basis and process of counseling. Exposes students to some of the skills of counseling and enables them to



develop an understanding of the elementary principles of counseling theory as well as a better understanding of themselves in relation to other people. Dual listed with CNSL 4520. *Prerequisite:* 6 hours of education or psychology and graduate standing.

**5580. Supervised Internship. 1-6 (Max. 16).** Provides a capstone clinical experience, preparing graduates to enter the practice of counseling PK-12 schools, mental health settings, and student affairs services in higher education. Students engage in professional counseling activities at approved placement sites. *Prerequisites:* graduate standing, CNSL 5310, 5320 and consent of the designated field setting authority.

**5610. Advanced Practice in Group and Family Counseling. 3.** Designed to provide a theoretical framework for understanding group dynamics and family systems, as well as offer intervention guidelines, best practices, and supervised experience in group leadership and family counseling. *Prerequisites:* program admission and consent of instructor.

**5620. Organization and Administration in Student Affairs. 3.** An introduction to college student affairs practice, specifically exploring issues related to the organization and administration of student personnel services. Explores the history, the philosophy, and the skills utilized in student personnel services within the context of various higher education institutions and settings. Dual listed with CNSL 4620. *Prerequisite:* department consent.

**5640. Diagnosis, Psychopathology, and Psychopharmacology. 3.** Introduction to the etiology, prevention, and treatment of mental and emotional disorders. Includes a focus on the skills of biopsychosocial case conceptualization and treatment planning, and multi-axial differential diagnosis using the current edition of the Diagnostic and Statistical Manual. Also addresses basic classifications, indications and contraindications of common pharmacological interventions. *Prerequisite:* department consent.

**5650. Counseling Theories. 2-3 (Max. 3).** Designed to increase understanding of major counseling theories, with an emphasis on the integration of theoretical and philosophical assumptions with personal viewpoints. *Prerequisites:* previous or concurrent enrollment in CNSL 4520/5520 or equivalent, admission to counseling program, consent of instructor.

**5655. Advanced Counseling Theories. 2.** Designed to stimulate in-depth examination and research into existing counseling theories essential to developing a personal theoretical orientation to counseling. *Prerequisite:* advanced graduate standing.

**5740. Field Studies in Counselor Education. 1-12 (Max. 12).** Offered only through college extension services. It is flexible and is utilized to meet local needs in the state. Credit in this course is not applicable toward advanced degrees in counseling. *Prerequisites:* graduate standing, permission of instructor and program director.

**5860. Doctoral Practicum in Counselor Education. 1-8 (Max. 8).** Enrollment is limited to five graduate students per instructor. In this practicum, advanced graduate students are given an intensive supervised experience in counseling students over an extended period of time. The actual counseling experience is supplemented by input and evaluation seminars for all enrollees and by supervisory conferences designed to improve sensitivity and skill in counseling. *Prerequisites:* admission to the doctorate program in counseling, mastery of basic interviewing and counseling skills, and consent of instructor.

**5865. Supervision Theory. 3.** Provides students with the theoretical, knowledge and research base of clinical supervision as it relates to the counseling profession. *Prerequisite:* CNSL 5860.

**5870. Seminar. 1-6 (Max. 12).** Advanced students work together intensively on current issues and problems and participate in systematic, critical interpersonal evaluation. Seminars are organized with various patterns of emphasis and provide for a variety of small group experiences related to curricular areas within the department. *Prerequisites:* consent of instructor and graduate standing.

**5871. Doctoral Seminar I: Professional Identity and Ethics. 3.** The doctoral seminar course sequence provides a structure for collegial discussion and collaboration among counselor education doctoral students and faculty. Doctoral Seminar I focuses on counselor education identity development and professional ethics for future counselor educators. *Prerequisite:* Admission as a Counselor Education & Supervision PhD Student.

**5872. Doctoral Seminar II: Diversity and Social Change. 3.** The doctoral seminar course sequence provides a structure for collegial discussion and collaboration among counselor education doctoral students and faculty. Doctoral Seminar II focuses on the role of diversity and social change in counselor education. *Prerequisite:* Admission as a Counselor Education & Supervision PhD Student.

**5873. Doctoral Seminar III: Research, Assessment & Scholarship. 3.** The doctoral seminar course sequence provides a structure for collegial discussion and collaboration among counselor education doctoral students

and faculty. Doctoral Seminar III focuses on the role of research, assessment and scholarship in counselor education. *Prerequisite:* Admission as a Counselor Education & Supervision PhD student.

**5874. Doctoral Seminar IV: Leadership, Consultation and Advocacy. 3.** The doctoral seminar course sequence provides a structure for collegial discussion and collaboration among counselor education doctoral students and faculty. Doctoral Seminar IV focuses on the role of leadership, consultation and advocacy in counselor education. *Prerequisite:* Admission as a Counselor Education & Supervision PhD Student.

**5875. Doctoral Practicum in Supervision. 1-6 (Max. 6).** Designed to provide the prospective counseling educator or supervisor with an understanding of the learning process in counseling and the supervisory behaviors requisite for improving the competencies and professional growth of counselors. Specialized knowledge, skills, and attitudes related to the act of supervising are supplemented by various methods and techniques such as videotape, films, film-tape synchronization, simulation material, role-playing, group dynamics, communication games, interpersonal recall, interaction and content analysis, and micro-counseling. *Prerequisites:* CNSL 5860, graduate standing, and consent of instructor.

**5880. Special Problems. 1-9 (Max. 9).** Provides a broad perspective through selected reading material. Wherever possible the student collects and uses original information from a practical work situation. All work is done independently under the direction of a faculty member. A minimum of three conferences are held as necessary to assure successful completion of the project. *Prerequisites:* consent of instructor and department head, and graduate standing.

**5890. Directed Professional Study. 1-9 (Max. 9).** Similar to CNSL 5880. Provides additional opportunity for students to pursue advanced graduate work through independent research. Projects are done under the direction of a graduate faculty member. *Prerequisites:* consent of instructor and department head, and graduate standing.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

## Educational Administration

### The Program

The Educational Administration program simultaneously serves the formal academic leadership development needs of persons aspiring to become K-12 leaders and leaders in adult education or post secondary education institutions. The program responds to school boards, community college boards of trustees and state education agencies for close coordination and collaboration between K-12 and adult and post secondary education. Thus, the programs prepare managers and leaders for K-12 education, post secondary education and adult education. In the K-12 education setting, these managers and leaders include public and private school principals (including those at the assistant and associate level), district office personnel and district superintendents. In the post secondary education and adult education settings, these managers and leaders include coordinators, directors, deans and executive leaders at community colleges and adult education organizations.

The program encompasses two graduate cognates:

- Adult and Post Secondary Education
- K-12 Educational Leadership

### Adult and Post Secondary Education

This option offers the following graduate degrees in education: master of arts (M.A.), doctor of education (Ed.D.), and Philosophy of Education (Ph.D). The master's program requires 33 credit hours beyond the bachelor's degree and is available online. The Ed.D. is the terminal professional degree in education designed for students who desire to improve their professional practice as educators. The Ed.D. requires a minimum of 77 semester hours beyond the bachelor's degree. A bachelor's and master's degree is required of all students to be admitted to an Ed.D. program. Candidates may, with the approval of the faculty, transfer up to 30 semester hours from previous course work.

Areas of study include the following:

1. adult development and learning theories;
2. community college leadership;
3. the social, historical, and international context of adult education.

Graduate study addresses the challenges faced by institutions and agencies in the design and delivery of post secondary education and

the preparation of educators to meet these challenges. Students completing the Ed.D. program with a focus on community college leadership complete coursework focusing on organizational strategy, resource management, effective communication, collaboration, community college advocacy and professionalism.

### Career Options

Graduates are employed specifically as faculty and administrators in community colleges and universities, human resource developers, adult literacy educators, public service training specialists, training coordinators for social service agencies (such as the Department of Family Services, the Department of Labor, Family Planning Agencies, and the Eppson Center for Seniors), museum educators, adult learning consultants, and continuing professional educators.

### Program Specific Degree Requirements Master's Program

#### Master of Arts in Education, Option: Educational Administration, Cognate: Adult and Post Secondary Education Plan A (thesis)

- Minimum of 33 hours of graduate credit
- 30 hours of program area core graduate hours
- Approval of adviser
- 3 hours of EDRE 5530 Introduction to Educational Research
- 4 hours of thesis research

#### Plan B (non-thesis)

- Minimum of 33 hours of graduate credit
- 30 hours of program area graduate hours
- 3 hours of EDRE 5530 Introduction to Educational Research

### Program Specific Degree Requirements

*Doctor of Education (Ed.D.) in Education, Option: Educational Administration, Cognate: Adult and Post Secondary Education*

The Ed.D. is the terminal professional degree in education designed for students who desire to improve their professional practice as educators. The Ed.D. is delivered through distance delivery system and requires a minimum of 77 semester hours beyond the bachelor's degree, of which 41 hours must be taken in the student's chosen field, and 6 hours of dissertation. Candidates may, with the approval of the faculty, transfer up to 30 semester hours from previous graduate level coursework. A bachelor's degree and a master's degree are required of all students to be admitted to the Ed.D. program.

### Program Specific Degree Requirements

*Doctor of Philosophy (Ph.D.) in Education, Option: Educational Administration, Cognate: Adult and Post Secondary Education*

The Ph.D. is a terminal professional degree in education designed for students who want to work as a faculty member in higher education. The Ph.D. requires 81 semester hours beyond the bachelor's degree, of which 39 hours must be taken in the student's chosen field including research courses, and 12 dissertation hours. Candidates may, with the approval of the faculty, transfer up to 30 semester hours from previous graduate level coursework. A bachelor's degree and a master's degree are required of all students to be admitted to the Ph.D. program.

### Program Specific Admission Requirements

Application deadlines and materials can be found on the department web page (<http://www.uwyo.edu/profstudies/>).

### Program Specific Graduate Assistantships

Applicants interested in a Graduate Assistantship must submit a graduate assistantship application to the Professional Studies department office no later than February 1 for fall term admission (see above).

### Learner Outcomes

1. Academic Knowledge: Students will demonstrate a deep understanding of knowledge related to the nature, function and scope of adult and continuing education; historical, philosophical and sociological foundations; adult learning and development; program processes including planning, delivery, and assessment/evaluation.
2. Practical Competence: Students will demonstrate the ability to translate academic knowledge into expert practice related to their professional roles and specialized areas of interest.
3. Reflective Inquiry: Students will demonstrate a reflective stance toward their professional practice and competence with diverse, critical and global perspectives and key tools of inquiry related to this field of study.
4. Democratic Commitment: Students will demonstrate an understanding of the relationship between adult and continuing education and the complex process of

democracy and a commitment to pursue this process with a focus on equal learning opportunities.

5. **Professional Engagement:** Students will demonstrate intellectual engagement with adult and continuing education practices through creative and scholarly pursuits, participation in professional associations, and related activities.

## Adult Education (ADED)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

### 1000. Adult Education Inquiry. 2. [1♦(none)]

Basic underpinnings of the field of adult education. Themes discussed include learning theories, learning styles, multiple ways of knowing, and issues surrounding access, opportunity, diversity, and schooling. While serving as an introduction to careers and theory in adult education, also addresses some practical higher education survival skills.

### 1008. Eastern Thought Western Practice. 2. [1♦(none)]

Major concepts of Eastern thought from Confucius and Osho are explored, examined, to understand eastern ways of perceiving reality, knowledge, and values. Hands-on activities are employed to experience and practice the applications of the concepts. Students are challenged to critically think, analyze, and compare with their own, increase their consciousness of diversity.

### 4750 [EDUC 4750]. Perspective on Teaching. 1-3 (Max. 6).

For undergraduate students selected to collaborate with UW faculty or professional staff in the delivery and sometimes the design of a university course, this course augments in-class experiences with an examination of basic learning and teaching principles. *Prerequisite:* 3.0 GPA.

**5000. Trends In Adult Education. 3.** Provides reading, discussion, research, and appraisal of new methods, materials, equipment, and experimental programs concerned with the improvement of education as it pertains to adult education. *Prerequisite:* graduate standing.

**5020. Survey of Adult Education. 3.** Designed as an introduction to the field of adult education; its focus is the general knowledge base upon which the practice of adult education rests; e.g. history and philosophy, adult learning and development, agencies and programs, and problems and issues. *Prerequisite:* graduate standing.

**5050. Learning Theories for Education. 3.** Learning and development theories are essential for educators who are designing and implementing educational applications

and opportunities. Topics covered include orientations toward learning, motivation, life transitions, cognition, learning how to learn, self-directed learning, and strategies for improving learning in educational contexts. *Prerequisite:* graduate standing.

**5090. Masters Capstone. 3.** Provides exposure to situations students will likely encounter professionally. It establishes a forum where students apply and refine theories, principles, and skills learned during their programs. Students examine and critique current scholarship and document general degree specific competencies. Cross listed with ITEC 5090. *Prerequisites:* Check with advisor and complete required sequence of courses for Educational Administration (Adult and Postsecondary Education) or Instructional Technology masters degree programs prior to enrollment.

**5100. Mountain Folk School. 2.** Within residential and learning community, this course seeks to strengthen one's relationship with the natural world, increase understanding of cultural heritage, and heighten sensitivity for time and place. Participants explore ways of further developing keener ways of seeing, critiquing, and connecting to the setting and heritage surrounding them. *Prerequisite:* graduate standing.

**5240. Teaching Adults. 3.** Developed upon the premise that individuals teach as they would expect to be taught. Focuses on methods for teaching adults in formal as well as informal settings. The learning styles literature is reviewed and implications for instructional settings are analyzed. Participants also critique their teaching performance through videotaped sessions. *Prerequisite:* graduate standing.

**5260. Educational Issues Race, Class, and Gender. 3.** Designed to help participants examine the current issues and debates in the literature of race, class, and gender from theoretical and practical perspectives. Related areas of ethnicity, national origin, sexual orientation, language, physical appearance, body size, and other constructs of difference will also be addressed. *Prerequisite:* graduate standing.

**5440. Information Technology. 3.** Provides information to help learners efficiently access information electronically. Philosophical, ethical, and management issues as well as technical information on the various mechanisms for electronic access now and in the near future are presented. The analysis of needs combined with knowledge of electronic tools for the purpose of efficiently meeting the information needs of clientele is stressed, as well as knowledge of the appropriate use of electronic

products for more specific problems/projects. Cross listed with LIBS 5440. *Prerequisite:* graduate standing and/or consent of instructor.

**5450. Short Course In Adult Education. 1-2 (Max. 6).** Used for special topics in adult education on the basis of need. *Prerequisite:* graduate standing.

**5490. Directed Professional Study. 1-6 (Max. 6).** It provides additional opportunity for a student to pursue advanced graduate work through independent research. Projects are done under the direction of a graduate faculty member. *Prerequisite:* graduate standing.

**5510. Adult Education Movement in the United States. 3.** Provides an opportunity to explore significant works and historical moments in the adult education and instructional technology literature, to analyze the emergence of an adult education movement in the United States, and to participate in local research into the history of Wyoming adult education and instructional technology activities. *Prerequisite:* graduate standing.

**5600. Higher Education Finance. 3.** Provides an overview of the economics and finance of higher education in the United States with an emphasis on the analysis of financial policies and current issues at the institutional, state, and national levels. *Prerequisite:* Admission to the program.

**5610. Planning and Evaluation of Instructional Systems. 3.** Participants investigate the concepts, issues, methods, and attitudes involved in the planning and evaluation of instructional systems. Topics covered include planning processes, theory and technique, promotion, evaluation, setting objectives, and trend analysis. *Prerequisite:* graduate standing.

**5630. Advanced Organizational Leadership. 3.** Examines central issues in advanced organizational leadership to prepare practitioners for leadership roles in educational settings. Working individually and as a member of a group, students will conduct conceptual analyses and complete a literature review paper and an organizational case study. *Prerequisite:* Admission to the program.

**5640. Leadership Development. 3.** Examines central issues in the internal dimension of leadership to prepare leaders in postsecondary educational settings. Working individually and as a member of a group, students will conduct conceptual analyses and complete a literature review paper and a biographical case study of a postsecondary educational leader. *Prerequisite:* Admission to the program.

**5650. Law of Higher Education. 3.** Examine specific legal issues encountered by instructional leaders in higher education settings. Critically examines the basic rights and duties

of institutional employees and students. It also explains when and how instructional leaders should refer matters to legal counsel. *Prerequisite:* Admission to the program.

**5660. Community College. 3.** Concerns the philosophy, organization, program, and administration of the community college. *Prerequisite:* graduate standing and consent of instructor.

**5670. Community College Issues and Leadership. 3.** Examine, analyze, the primary responsibility of instructional leaders at the community college, management of the curriculum. In particular, focus on the remedial/developmental education programs, general education, the liberal arts transfer curriculum, technical education, and noncredit and contract training programs. *Prerequisite:* Admission to the program.

**5680. Issues in Higher Education. 3.** Through examination of historical foundations and current trends, ADED 5680 delves into pressing issues in the academy, including but not limited to topics of tenure, governance, professional colleges, access and equity, curriculum and international needs. *Prerequisite:* graduate standing.

**5710. International and Comparative Education. 3.** Introduces foundations and theories of international and comparative education, explores education from global and comparative perspectives. Topics: Historical development, definitions and purposes, current practices and issues of international and comparative education; governmental and non-governmental roles, impact of globalization, technology, economic development, and cultural dimensions as applied to educational contexts. *Prerequisite:* graduate standing.

**5750. Advanced Learning Theories. 3.** Introduces current learning theories/perspectives that advance understandings previously developed. It helps broaden learning/teaching from a more holistic perspective towards sociological and cultural dimensions within the globalized contexts. Topics include learning in social contexts, influences of globalization, technology, economic development, and culture. Additionally, Non-western perspectives will be reviewed/discussed. *Prerequisite:* Admission to the program.

**5880. Special Problems in Adult Education. 1-6 (Max. 9).** Provides a broad perspective through selected reading material. Wherever possible, the student collects and uses original information from an adult education/instructional technology setting. All work is done independently under the direction of a faculty member. *Prerequisite:* graduate standing.

**5890. Seminar in Adult Education. 1-6 (Max. 8).** Advanced students in education work together intensively on current issues and problems relevant to adult education and participate in systematic, critical interpersonal evaluation. Eight hours are permitted on a doctoral program. *Prerequisite:* graduate standing.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

## K-12 Educational Leadership

The curriculum in educational leadership is designed to prepare superintendents, principals, supervisors for public schools and leaders for organizations to perform duties of a specialized nature and to function effectively in a leadership capacity. The program provides sufficient breadth to give candidates for advanced degrees ample opportunity to develop essential competencies.

### Degrees and Certificates Offered

Students who major in education with an option in educational administration and educational leadership track may choose one of the following certificate or degree programs: Principal Certificate program for eligibility of a K-12 Principal Certificate endorsement (does not lead to a master's degree), Master of Arts in Education, Doctor of Education and Doctor of Philosophy. Additional information may be found on the department webpage, ([www.uwyo.edu/profstudies/](http://www.uwyo.edu/profstudies/)).

### Program Specific Admission Requirements

Candidates for a master's degree in education in the educational leadership track, in addition to the admission requirements of the university, must complete a selection process which may include assessment in the following areas: teaching experience, a writing sample, and faculty interview.

Candidates for the doctor of education and the doctor of philosophy degree, in addition to the admission requirements of the university, must complete a selection process which may include the following prerequisites and assessment in the following areas: hold a master's degree, writing sample, and faculty interview.

Candidates for the University Graduate Certificate in School Principalship must file a university application with the Admissions Office, if not concurrently enrolled in a gradu-

ate program at the University of Wyoming. In addition, candidates must complete a selection process which may include assessment in the following areas: master's degree in an education related area from an accredited institution, writing sample, and faculty interview.

### Program Specific Degree Requirements

#### Principal Certificate program

The endorsement/certificate is 21 credits which includes the four core classes, 3 credits each: EDAD 5010, Leadership for Curriculum Development; EDAD 5020, Leadership for School Organization; EDAD 5030, Leadership for School and Community Relations; EDAD 5040, Leadership for Instruction; EDAD 5580, Supervised Internship, 6 credits, and EDRE 5530 Intro to Research, 3 credits.

### Program Specific Degree Requirements

#### Master's program

The master's is a 33 credit program which includes the four core classes, 3 credits each: EDAD 5010, Leadership for Curriculum Development; EDAD 5020, Leadership for School Organization; EDAD 5030, Leadership for School and Community Relations; EDAD 5040, Leadership for Instruction; EDAD 5580, Supervised Internship, 6 credits, EDEX 5720, Special Education Law, 3 credits, EDAD 5050, Leadership for Democratic Schools, 3 credits; EDAD 5150, Assessment, Accountability, and Student Learning, EDRE 5530 Intro to Research, 3 credits; and EDAD 5080 Introduction to School Law, 3 credits.

### Program Specific Degree Requirements

#### Educational Leadership Doctoral Program (Ed.D.) (Including Superintendent Certificate)

#### Core Educational Leadership Courses

ADED 5630 Advanced Organizational Leadership .....	3
EDAD 5600 Educational Leader as Manager of Human Resources.....	3
EDAD 5650 Educational Leader as Communicator .....	3
EDAD 5700 Educational Leader for Instruction .....	3
EDCI 5720 Educational Leader as Change Agent .....	3
EDAD 5750 Educational Leader for the Board and Community.....	3
EDAD 5800 Educational Leader as Resource Manager.....	3
EDAD 5815 Advanced School Law .....	3
EDAD 5850 Educational Leader as Direction Setter .....	3
<i>Internship</i>	
EDAD 5580 Internship .....	2

<i>Educational Research Courses</i> (at least 1 quantitative and 1 qualitative)	
EDRE 5600 Educational Research 1: Descriptive Research .....	3
EDRE 5610 Educational Research 2: Group Comparison .....	3
EDRE 5620 Educational Research 3: Correlation .....	3
EDRE 5640 Intro to Qual. Research .....	3
EDRE 5650 Advanced Qual. Research .....	3
EDRE 5660 Dissertation/Thesis Prospectus Writing .....	3
EDAD 5980 Dissertation Research .....	6

### Program Specific Degree Requirements

*Doctor of Philosophy (Ph.D.) program*

#### Minimum of 79 total credits required in the following areas:

*Core courses (minimum of 9 credits)*

All PhD option areas require PRST 5610, Intro to Doctoral Studies. In addition, doctoral students, with direction from their committees, will choose a minimum of two additional courses from the remaining five core courses:

- PRST 5900 (Practicum in College Teaching)
- EDCI 5600 (Diversity)
- EDCI 5810 (Writing for Publication)
- EDCI 5730 (Learning and Cognition)
- EDAD 5720 (Leader as Change Agent)
- EDRE 5660 (Dissertation/Thesis Prospectus Writing)

We also understand that students may meet the requirements for the core content in other ways, such as a master's degree in an area that emphasizes coursework in diversity or multi-cultural education. Committees may determine that the requirements for additional course(s) have been met. However, Introduction to Doctoral Studies may not be waived.

#### Cognate courses and advanced courses (minimum 18 credit hours)

EDAD 5650 Educational Leader as Communicator .....	3
EDAD 5720 Educational Leader as Change Agent .....	3
EDAD 5850 Educational Leader as Director Setter .....	3
ADED 5630 Advanced Organizational Leadership .....	3
ADED 5680 Issues in Higher Education .....	3
ADED 5600 Higher Education Finance .....	3

#### Advanced research courses (minimum 12 credit hours).

All students are required to take at least one quantitative and one qualitative course from the following list:

EDRE 5600 Educational Research 1: Descriptive Research .....	3
EDRE 5610 Educational Research 2: Group Comparison Research .....	3
EDRE 5620 Educational Research 3: Correlational Research .....	3
EDRE 5630 Educational Research 4: Multivariate Research .....	3
EDRE 5640 Introduction to Qualitative Research .....	3
EDRE 5650 Advanced Qualitative Research .....	3
EDRE 5870 Qualitative Research III .....	3
EDRE 5670 Mixed Methods Research .....	3

#### Dissertation Hours

The required number of dissertation credits be a minimum of 12.

Preliminary exam (after coursework is completed): Guidelines determined by program, department, or committee

Program Outcomes: Written demonstration is required to show PhD outcomes are met (determined by program, department, or committee)

Dissertation (after preliminary exam): Guidelines determined by program, department, or committee

#### Notes:

These requirements for a PhD in Education are minimum requirements only. Students should check specific program options for additional requirements, including admissions criteria. Options approved prior to May 2013 may have different requirements.

#### Learner Outcomes

##### 2011 ELCC District Level Standards

Standard 1.0: A district-level education leader applies knowledge that promotes the success of every student by facilitating the development, articulation, implementation, and stewardship of a shared district vision of learning through the collection and use of data to identify district goals, assess organizational effectiveness, and implement district plans to achieve district goals; promotion of continual and sustainable district improvement; and evaluation of district progress and revision of district plans supported by district stakeholders.

1.1 Candidates understand and can collaboratively develop, articulate, implement, and steward a shared district vision of learning for a school district.

1.2 Candidates understand and can collect and use data to identify district goals, assess organizational effectiveness, and implement district plans to achieve district goals.

1.3 Candidates understand and can promote continual and sustainable district improvement.

1.4 Candidates understand and can evaluate district progress and revise district plans supported by district stakeholders.

Standard 2.0: A district-level education leader applies knowledge that promotes the success of every student by sustaining a district culture conducive to collaboration, trust, and a personalized learning environment with high expectations for students; creating and evaluating a comprehensive, rigorous, and coherent curricular and instructional district program; developing and supervising the instructional and leadership capacity across the district; and promoting the most effective and appropriate technologies to support teaching and learning within the district.

2.1 Candidates understand and can advocate, nurture, and sustain a district culture and instructional program conducive to student learning through collaboration, trust, and a personalized learning environment with high expectations for students.

2.2 Candidates understand and can create and evaluate a comprehensive, rigorous, and coherent curricular and instructional district program.

2.3 Candidates understand and can develop and supervise the instructional and leadership capacity across the district.

2.4 Candidates understand and can promote the most effective and appropriate district technologies to support teaching and learning within the district.

Standard 3.0: A district-level education leader applies knowledge that promotes the success of every student by ensuring the management of the district's organization, operation, and resources through monitoring and evaluating district management and operational systems; efficiently using human, fiscal, and technological resources within the district; promoting district-level policies and procedures that protect the welfare and safety of students and staff across the district; developing district capacity for distributed leadership; and ensuring that district time focuses on high-quality instruction and student learning.

3.1 Candidates understand and can monitor and evaluate district management and operational systems.

3.2 Candidates understand and can efficiently use human, fiscal, and technological resources within the district.

3.3 Candidates understand and can promote district-level policies and procedures that protect the welfare and safety of students and staff across the district.

3.4 Candidates understand and can develop district capacity for distributed leadership.

3.5 Candidates understand and can ensure that district time focuses on supporting high-quality school instruction and student learning.

Standard 4.0: A district-level education leader applies knowledge that promotes the success of every student by collaborating with faculty and community members, responding to diverse community interests and needs, and mobilizing community resources for the district by collecting and analyzing information pertinent to improvement of the district's educational environment; promoting an understanding, appreciation, and use of the community's diverse cultural, social, and intellectual resources throughout the district; building and sustaining positive district relationships with families and caregivers; and cultivating productive district relationships with community partners.

4.1 Candidates understand and can collaborate with faculty and community members by collecting and analyzing information pertinent to the improvement of the district's educational environment.

4.2 Candidates understand and can mobilize community resources by promoting understanding, appreciation, and use of the community's diverse cultural, social, and intellectual resources throughout the district.

4.3 Candidates understand and can respond to community interests and needs by building and sustaining positive district relationships with families and caregivers.

4.4 Candidates understand and can respond to community interests and needs by building and sustaining productive district relationships with community partners.

Standard 5.0: A district-level education leader applies knowledge that promotes the success of every student by acting with integrity, fairness, and in an ethical manner to ensure a district system of accountability for every student's academic and social success by modeling district principles of self-awareness, reflective practice, transparency, and ethical behavior as related to their roles within the

district; safeguarding the values of democracy, equity, and diversity within the district; evaluating the potential moral and legal consequences of decision making in the district; and promoting social justice within the district to ensure individual student needs inform all aspects of schooling.

5.1 Candidates understand and can act with integrity and fairness to ensure a district system of accountability for every student's academic and social success.

5.2 Candidates understand and can model principles of self-awareness, reflective practice, transparency, and ethical behavior as related to their roles within the district.

### **2011 ELCC Building Level Standards**

Standard 1.0: A building-level education leader applies knowledge that promotes the success of every student by collaboratively facilitating the development, articulation, implementation, and stewardship of a shared school vision of learning through the collection and use of data to identify school goals, assess organizational effectiveness, and implement school plans to achieve school goals; promotion of continual and sustainable school improvement; and evaluation of school progress and revision of school plans supported by school-based stakeholders.

1.1 Candidates understand and can collaboratively develop, articulate, implement, and steward a shared vision of learning for a school.

1.2 Candidates understand and can collect and use data to identify school goals, assess organizational effectiveness, and implement plans to achieve school goals.

1.3 Candidates understand and can promote continual and sustainable school improvement.

1.4 Candidates understand and can evaluate school progress and revise school plans supported by school stakeholders.

Standard 2.0: A building-level education leader applies knowledge that promotes the success of every student by sustaining a school culture and instructional program conducive to student learning through collaboration, trust, and a personalized learning environment with high expectations for students; creating and evaluating a comprehensive, rigorous and coherent curricular and instructional school program; developing and supervising the instructional and leadership capacity of school staff; and promoting the most effective and appropriate technologies to support teaching and learning within a school environment.

2.1 Candidates understand and can sustain a school culture and instructional program conducive to student learning through collaboration, trust, and a personalized learning environment with high expectations for students.

2.2 Candidates understand and can create and evaluate a comprehensive, rigorous, and coherent curricular and instructional school program.

2.3 Candidates understand and can develop and supervise the instructional and leadership capacity of school staff.

2.4 Candidates understand and can promote the most effective and appropriate technologies to support teaching and learning in a school environment.

Standard 3.0: A building-level education leader applies knowledge that promotes the success of every student by ensuring the management of the school organization, operation, and resources through monitoring and evaluating the school management and operational systems; efficiently using human, fiscal, and technological resources in a school environment; promoting and protecting the welfare and safety of school students and staff; developing school capacity for distributed leadership; and ensuring that teacher and organizational time is focused to support high-quality instruction and student learning.

3.1 Candidates understand and can monitor and evaluate school management and operational systems.

3.2 Candidates understand and can efficiently use human, fiscal, and technological resources to manage school operations.

3.3 Candidates understand and can promote school-based policies and procedures that protect the welfare and safety of students and staff within the school.

3.4 Candidates understand and can develop school capacity for distributed leadership.

3.5 Candidates understand and can ensure teacher and organizational time focuses on supporting high-quality school instruction and student learning.

Standard 4.0: A building-level education leader applies knowledge that promotes the success of every student by collaborating with faculty and community members, responding to diverse community interests and needs, and mobilizing community resources on behalf of the school by collecting and analyzing information pertinent to improvement of the school's educational environment; promoting

an understanding, appreciation, and use of the diverse cultural, social, and intellectual resources within the school community; building and sustaining positive school relationships with families and caregivers; and cultivating productive school relationships with community partners.

4.1 Candidates understand and can collaborate with faculty and community members by collecting and analyzing information pertinent to the improvement of the school's educational environment.

4.2 Candidates understand and can mobilize community resources by promoting an understanding, appreciation, and use of diverse cultural, social, and intellectual resources within the school community.

4.3 Candidates understand and can respond to community interests and needs by building and sustaining positive school relationships with families and caregivers.

4.4 Candidates understand and can respond to community interests and needs by building and sustaining productive school relationships with community partners.

Standard 5.0: A building-level education leader applies knowledge that promotes the success of every student by acting with integrity, fairness, and in an ethical manner to ensure a school system of accountability for every student's academic and social success by modeling school principles of self-awareness, reflective practice, transparency, and ethical behavior as related to their roles within the school; safeguarding the values of democracy, equity, and diversity within the school; evaluating the potential moral and legal consequences of decision making in the school; and promoting social justice within the school to ensure that individual student needs inform all aspects of schooling.

5.1 Candidates understand and can act with integrity and fairness to ensure a school system of accountability for every student's academic and social success.

5.2 Candidates understand and can model principles of self-awareness, reflective practice, transparency, and ethical behavior as related to their roles within the school.

5.3 Candidates understand and can safeguard the values of democracy, equity, and diversity within the school.

5.4 Candidates understand and can evaluate the potential moral and legal consequences of decision making in the school.

5.5 Candidates understand and can promote social justice within the school to ensure that individual student needs inform all aspects of schooling.

Standard 6.0: A building-level education leader applies knowledge that promotes the success of every student by understanding, responding to, and influencing the larger political, social, economic, legal, and cultural context through advocating for school students, families, and caregivers; acting to influence local, district, state, and national decisions affecting student learning in a school environment; and anticipating and assessing emerging trends and initiatives in order to adapt school-based leadership strategies.

6.1 Candidates understand and can advocate for school students, families, and caregivers.

6.2 Candidates understand and can act to influence local, district, state, and national decisions affecting student learning in a school environment.

6.3 Candidates understand and can anticipate and assess emerging trends and initiatives in order to adapt school-based leadership strategies.

Standard 7.0: A building-level education leader applies knowledge that promotes the success of every student through a substantial and sustained educational leadership internship experience that has school-based field experiences and clinical internship practice within a school setting and is monitored by a qualified, on-site mentor.

7.1 Substantial Field and Clinical Internship Experience: The program provides significant field experiences and clinical internship practice for candidates within a school environment to synthesize and apply the content knowledge and develop professional skills identified in the other Educational Leadership Building-Level Program Standards through authentic, school-based leadership experiences.

7.2 Sustained Internship Experience: Candidates are provided a six-month, concentrated (9–12 hours per week) internship that includes field experiences within a school-based environment.

7.3 Qualified On-Site Mentor: An on-site school mentor who has demonstrated experience as an educational leader within a school and is selected collaboratively by the intern and program faculty with training by the supervising institution.

## K-12 Educational Leadership (EDAD)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**1000. Schools and Democracy. 1. [I♦(none)]** Content-based course focuses on critical-thinking skills necessary to understand, analyze, and produce knowledge within the framework of educational inquiry; introducing students to the themes of the agenda of the National Network for Educational Renewal which focuses on the purpose of schools in America.

**5010. Leadership for Curriculum Development. 3.** Focuses on leadership skills that support curriculum and curriculum development in student learning and achievement. Key topics include: K-12 curriculum alignment; incorporating standards and community values; curriculum development, implementation, and evaluation; equity and access for diverse learning needs; and effective communication about curriculum. *Prerequisite:* Admission to program or consent of instructor.

**5020. Leadership for School Organization. 3.** Focuses on organizational leadership. Topics include: history of organizational leadership, leadership styles, change process, strategic planning, federal, state, and local governance as well as politics, power and policy, and school operations, to include budget, facilities, scheduling, recruitment, selection and induction.

**5030. Leadership for School and Community Relations. 3.** Focuses on the leadership role of the principal in building relations with students, staff, family, and community. Topics include school culture and climate, community and family involvement, public relations and communications, student discipline, and crisis management. *Prerequisite:* admission to program or consent of instructor.

**5040. Leadership for Instruction. 3.** Focuses on the principal as instructional leader. Topics include: developing a school vision of learning; employing effective instructional strategies, supervision and evaluation of teacher performance; integration of supervision, evaluation, and student achievement with professional development and professional learning communities, and instructional trends and issues within diverse learning communities. *Prerequisite:* Admission to program or consent of instructor.

**5050. Leadership for Democratic Schools. 3.** Designed to increase awareness of future school leaders of the principles of equity and excellence in education focused on democratic

practices. Topics include democratic educational practices, ethical leadership, renewal of public schools, and educational leadership in urban, suburban, and rural communities, and in ethnically and socio-economically diverse settings. *Prerequisite:* graduate standing.

**5060. Capstone in Educational Leadership. 3.** Designed to assist the student in the creation of their master's program final project, which will be used as the written demonstration of mastery of the course outcomes as well as meeting the educational leadership (ELCC) standards. *Prerequisite:* complete Core (EDAD) courses.

**5070. Educational Trends. 1-6 (Max. 8).** Provides reading, discussion, research, appraisal of new methods, materials, equipment procedures, and experimental programs concerned with the improvement of professional education as it pertains to educational administration. The maximum allowable credit applies to the total offerings under this number. *Prerequisites:* graduate standing, teaching experience, 12 semester hours in education.

**5080. Introduction to School Law. 3.** This course provides legal foundations of U.S. public schools and examines general principles of statutory and case law and applies judicial decisions to educational environments. Additionally, the course focuses on legal responsibilities, constraints, and opportunities for school leaders. *Prerequisite:* admission into UW Educational Administration, K-12.

**5100. Human Relationships in Educational Leadership. 6.** Designed to encourage students to gain a deeper understanding of their own beliefs and an understanding of leadership issues through concentrated study as members of a cohort group with a team of faculty. *Prerequisites:* admission to Principal Preparation Program and graduate study.

**5150. Assessment, Accountability, and Student Learning. 3.** Focuses on the knowledge and skills necessary to lead schools in the alignment of standards, assessment, and instruction. Topics include analysis and interpretation of assessment results and educational data, recent history and current context of educational accountability in Wyoming, role of assessment and accountability in improving student learning. *Prerequisite:* graduate standing.

**5200. Educational Leadership and Organizational Management. 3.** Designed to encourage students to gain a deeper understanding of the principal as an organizational manager. Topics include school law, budgeting, facilities planning, climate and policy development. *Prerequisites:* admission to Principal Preparation Program and graduate standing.

**5300. Educational Leadership and Personnel Development. 3.** Designed to encourage students to gain a deeper understanding of the principal as a personnel developer. Topics include empowerment, staff development, supervision of instruction, evaluation and team building skills. *Prerequisites:* admission to Principal Preparation Program and graduate standing.

**5400. Instructional Leadership. 6.** Designed to develop instructional leadership in aspiring principals. Topics include situational leadership, quality schools, outcome-based education, curriculum development, assessment of learning and instruction, technology, change and effective schools. *Prerequisites:* admission to the Principal Preparation Program and graduate standing.

**5410. Short Course in Educational Administration. 1-6 (Max. 6).** Used for special topics in educational administration on the basis of need. *Prerequisites:* six hours of education and/or consent of instructor.

**5420. School Administration Workshop. 1-5 (Max. 5).** Workshop designed mainly for the experienced school administrator who desires to acquire the latest information about developments in various areas of education. It is devoted to the intensive study of major problems and issues confronting school administrators. *Prerequisites:* 12 hours of educational administration and graduate standing and/or consent of instructor.

**5490. Directed Professional Study. 1-6 (Max. 9).** Similar to EDAD 5880 and provides additional opportunity for a student to pursue advanced graduate work through independent research. Projects are done under the direction of a graduate faculty member. *Prerequisite:* consent of instructor and department, and graduate standing.

**5500. Communication in Educational Leadership. 3.** Designed for students to attain the knowledge and skills and to develop the attitudes congruent with the principal as an effective communicator. Topics include inter- and intra-personal communication skills, school and community relations, analysis of school and community power bases and group process skills. *Prerequisites:* admission to Principal Preparation Program and graduate standing.

**5580. Supervised Internship in Educational Administration. 1-8 (Max. 12).** Expand student knowledge by providing an intensive clinical experience in educational administration along with other activities that involve practical experiences with peers and with

practising K-12 administrators. *Prerequisite:* Admission into the UW Educational Leadership Principal Certificate, Master's or EdD Doctoral program.

**5600. Educational Leader as Manager of Human Resources. 3.** Focuses on linking theory related to organizations (including Bureaucracy Theory), decision-making and organizational effectiveness with effective practices in management of organizational personnel. *Prerequisite:* graduate standing.

**5650. Educational Leader as Communicator. 3.** Focuses on inter- and intra-personal communication skills; group facilitation; organization and community public relations; parent and community involvement; negotiation; and conflict management. *Prerequisite:* graduate standing.

**5700. Educational Leader For Instruction. 3.** Focuses on the study of curriculum development and implementation, instructional practice, assessment and staff development. *Prerequisite:* graduate standing.

**5720. Educational Leader as Change Agent. 3.** Focuses on the study of change theory, change processes, change dynamics, decision-making models, and implementation of change in the organization setting. *Prerequisite:* graduate standing.

**5750. Educational Leader for the Board and Community. 3.** Concentrates on the administrator as the leader of an organization's board and community. *Prerequisite:* graduate standing.

**5800. Educational Leader as Resource Manager. 3.** Focuses upon the successful management and operation of the organizations fiscal resources, facilities, and support services. Includes work in the areas of transportation, food service, funding and budget, compensation, facilities, legal issues, calendar, special education, and policy influence. *Prerequisite:* graduate standing.

**5815. Advanced School Law. 3.** Designed to provide advanced information concerning K-12 school law as it relates to public education. Students will acquire a deeper understanding of legal issues that routinely arise in the K-12 school setting. *Prerequisite:* Admission into the UW Educational Leadership EdD/PhD Doctoral Program.

**5820. Educational Leader as Developer of Human Resources. 3.** Focuses on linking the literature and theory of motivation, decision-making, team building, and organizational effectiveness to the implementation of effective practices in the areas of personnel empowerment. *Prerequisite:* graduate standing.

**5850. Educational Leader as Direction Setter. 3.** Investigates how the educational leader can effectively create a futuristic vision and



mission for the organization after assessing the existing culture and climate, and organizational readiness for change. *Prerequisite:* graduate standing.

**5870. Seminar in Legal Issues. 1-6 (Max. 8).**

Advanced students in education work together intensively on current issues and problems relevant to educational administration and participate in systematic, critical interpersonal evaluation. Eight hours are permitted on a doctoral program. *Prerequisite:* consent of instructor and graduate standing.

**5880. Special Problems. 1-6 (Max. 9).**

Provides a broad perspective through selected reading material and wherever possible the student collects and uses original information from a practical school situation. All work is done independently under the direction of a faculty member. As many conferences are held as necessary to assure successful completion of the project. *Prerequisite:* consent of instructor and department, and graduate standing.

**5959. Enrichment Studies. 1-3 (Max. 99).**

Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes. *Prerequisite:* advanced degree candidacy.

## Educational Research

The educational research faculty offer ten courses on a regular basis in educational research. These courses are open to graduate students throughout the college and the university. In addition, we offer two minors in educational research, one is qualitative research methods and one in quantitative research methods. Students currently enrolled in any UW master's or doctoral program are eligible for these minors. Both minors require students to complete 16 credit hours, a trial research project, and a co-teaching experience in educational research.

### Learner Outcomes

The goals of the educational research courses in the College of Education include developing the necessary skills, concepts, and understanding of research methodology to evaluate, use, and conduct research in a student's specific discipline. This goal requires the ability to do the following:

1. In a research study, critique the following the research problem and hypothesis; general design to insure that correct conclusions are possible from the statistical analysis; statistical analysis procedures to establish their valid use in the study;

reliability and validity of instruments used to collect data; and conclusions and interpretations to insure appropriateness of each.

2. Develop a problem appropriate for research. Examine a cross section of the current literature on the topic, placing the research problem within the context of the field.
3. Demonstrate knowledge of the reference sources available in a research library; know how and when to use available resources.
4. Compare and contrast research designs and methods and be able to identify examples, advantages, and disadvantages of each.
5. Be able to use statistics to describe a sample and make inferences.
6. Understand, design, and analyze results of various types of quantitative, qualitative, and mixed method research studies.
7. Understand the principles of measurement as they apply to specific studies.

## Educational Research (EDRE)

**5000. Educational Research. 3.**

**5530. Introduction To Research. 3.** Basic concepts of educational research design, statistics, and measurement. The focus of the course is on reading and critiquing research articles, both quantitative and qualitative, and includes an introduction to statistics. Students learn to conduct a review of the literature relevant to a specific research problem. *Prerequisite:* graduate standing.

**5580. Supervised Internship. 1-8 (Max. 12).**

**5600. Educational Research I: Descriptive Research. 3.** Basic concepts of educational survey research design, statistics, and measurement. The focus is on descriptive statistics (measures of central tendency, variability, percent and frequency distribution, bivariate correlation, graphical displays, testing hypotheses about proportions). Students develop questionnaires and plan, conduct, and report on a survey study. *Prerequisite:* EDRE 5530.

**5610. Educational Research II: Group Comparison Research. 3.**

Concepts of experimental and ex post facto research designs, statistics, and measurement. The focus is on inferential statistics. Students construct attitude scales and other instruments used in research and they plan, conduct, and report on a group comparison study. *Prerequisites:* EDRE 5530 and 5600.

**5620. Educational Research III: Correlational Research. 3.** Concepts of correlational research, statistics, and measurement. Focus is on the design and analysis of results from correlational studies. Statistical topics include MANOVA, multiple regression, factor analysis, and discriminant analysis. Includes measurement topics in classical measurement theory and additional topics in validity and reliability. Plan, conduct, and report on a correlational study. *Prerequisites:* EDRE 5530, 5600, and 5610.

**5630. Educational Research IV: Multivariate Research. 3.**

An advanced educational research, statistics, and measurement course. Design and analysis of results from studies with several dependent and independent variables. Includes multivariate statistics such as MANOVA, discriminant analysis, canonical correlation, multidimensional scaling, structural equation modeling, logit regression. Measurement topics include generalizability theory, item response theory, equating, and standard setting. *Prerequisites:* EDRE 5530, 5600, 5610, and 5620.

**5640. Introduction to Qualitative Research.**

**3.** Research methods course provides an introduction to the use of qualitative or interpretive research methods in the collection and analysis of data. Students will examine primary research as well as secondary research sources which represent a variety of theoretical and methodological viewpoints. *Prerequisites:* graduate standing and EDRE 5530.

**5650. Advanced Qualitative Research Methods. 3.**

Students examine the role of theory in qualitative research; develop expertise in particular qualitative research designs; study and practice data collection and analysis methods; examine and practice writing reports of results. Students engage in a fieldwork project. *Prerequisites:* EDRE 5530 and 5640.

**5660. Dissertation/Thesis Prospectus Writing. 3.**

Prepare graduate students to plan, develop, and write research proposals suitable for a dissertation/thesis. In consultation with the committee chair, students will focus on their own problem for research, conduct a literature review, choose appropriate methods for investigating the problem, and write a research proposal. *Prerequisites:* at least two of the following: EDRE 5530, EDRE 5550, EDRE 5600, EDRE 5610, EDRE 5620, EDRE 5640, EDRE 5650 or consent of instructor.

**5670. Mixed Methods Research. 3.** Provide an overview of mixed methods research to graduate students who are already familiar with quantitative and qualitative research. Specifically, they will learn the definition, history and foundations, and specific types of mixed

methods designs. Also plan a mixed methods research study. *Prerequisites:* EDRE 5600 and EDRE 5640.

**5870. Seminar. 1-8 (Max. 8).**

**5880. Special Problems. 1-6 (Max. 9).**

**5890. Directed Professional Study. 1-6 (Max. 9).**

**5959. Enrichment Studies. 1-3 (Max. 99).**

Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

## Instructional Technology

The curriculum in instructional technology is designed to assist professionals in effectively developing, implementing, and evaluating systems, tools, strategies, and environments that enhance learning. Graduates from the program secure employment in PK-12 classrooms; school media and technology centers, and school district administrative offices; public, corporate, and government centers and training agencies; college and university faculty and administrative positions; design and development labs; product support teams; and consulting firms.

### Degrees and Certificates Offered

Students who major in education with an option in instructional technology may choose one of the following certificate or degree programs: Master of Science in Education (M.S.), Doctor of Education (Ed.D.) or Doctor of Philosophy (Ph.D.), Online instruction Certificate program (does not lead to a master's degree). The program Web site (<http://www.uwyo.edu/profstudies/>) provides additional information.

### Program Specific Admission Requirements

Candidates for graduate degrees in education with an option in instructional technology must complete university admission requirements and submit additional application materials listed on the program Web site. A bachelor's degree is required for admittance to the M.S. program. A master's degree is required for Ed.D. and Ph.D. programs. Candidates for Ed.D. and Ph.D. programs may also participate in an interview during the selection process.

Candidates for the University Graduate Certificate in Online Instruction must file a university application with the Admissions Office, if not concurrently enrolled in a graduate program at the University of Wyoming. In addition, candidates must complete a selection

process which may include assessment in the following areas: bachelor's degree in education or related area from an accredited institution, three letters of recommendation, and personal statement.

### Program Specific Degree Requirement

#### *Online Instruction Certificate Program*

The certificate program consists of 12 credit hours of coursework. It is a post-baccalaureate, credit-bearing certificate program that includes four online courses: ITEC 5030, Introduction to Online Teaching; ITEC 5020, Technology and Distance Education; ITEC 5160, Introduction to Instructional Design (with an emphasis on online learning environments); and ITEC 5510, Instructional Telecommunications.

### Program Specific Degree Requirement

#### *Master of Science (M.S.) Program*

The M.S. program gives students the foundations to design, develop, implement, and evaluate instructional resources and systems in professional learning environments. Students examine the history of technology-based training, instructional design, and distance education to understand current trends and procedures in the field. They apply this knowledge through the design and development of novel training solutions targeted to diverse professional settings (e.g., K-12 education, corporate and government centers, design and development labs, higher education).

Through these experiences, students learn how to identify gaps in desired and current practice, design training solutions to eliminate or bridge those gaps, develop tools and methods to implement solutions, and evaluate and revise methods for continued success. Emphasis is placed on instructional systems that use both face-to-face and distance delivery methods. Students can complete all of their coursework online with the exception of a campus visit for their final defense in the Capstone course.

The M.S. is a 36-credit hour program and includes the following requirements:

#### *Plan A (Thesis)*

Program core graduate credits: 24

Electives: 6 credits

EDRE 5530, Introduction to Research

or

EDRE 5550, Action Research (3 credits)

PRST 5960, Thesis Research (3 credits)

#### *Plan B (Non-Thesis)*

Program core graduate credits: 24 credits

Electives: 6 credits

EDRE 5530, Introduction to

Research or EDRE 5550,

Action Research (3 credits)

ITEC 5090, Masters Capstone course (3 credits)

### Program Specific Degree Requirement

#### *Doctor of Education (Ed.D.) Program*

Residency requirement: Two spring residencies that last between 1-3 days on campus

The Ed.D. is the terminal professional degree in education designed for students who desire to improve their professional practice as educators. The program moves beyond the foundations of distance education, instructional design, and technology integration to focus on advanced application and research. Students apply design, development, and evaluation principles to explore authentic challenges and develop real solutions in diverse settings (e.g., K-12 education, corporate and government centers, and higher education institutions). Through these experiences, students learn how to use advanced research methods to explore workplace problems, design and deliver solutions, and implement and evaluate change. Emphasis is placed on in-depth mentoring and collaboration, advanced research, development of real-world applications, and training solutions offered through both face-to-face and distance delivery platforms.

The Ed.D. program requires a minimum of 81 credit hours beyond the bachelor's degree. Candidates may, with the approval of the committee, transfer up to 30 credit hours from previous graduate-level coursework in a closely related field. The program is delivered online with the exception of some advanced research courses and the spring residencies.

Program knowledge base: 48 credits

Research: 9 credits

Professional Writing: 6 credits

Electives: 12 credits

Dissertation: 6 credits

### Program Specific Degree Requirement

#### *Doctor of Philosophy (Ph.D.) Program*

Residency requirement: Four consecutive full-time semesters on campus

The Ph.D. program prepares students for careers in academia. The program consists of: (1) systematic inquiry and research; (2) focused courses and professional experiences in education and related fields; and (3) teaching and other related activities tailored to individual career goals. Students work closely with an ad-

visor and faculty committee to select courses, conduct research, and develop professional experiences.

Effective preparation for the Ph.D. stems from collaborative research and inquiry into topics of mutual interest by students and faculty. The program is structured around a cognitive apprenticeship model. Students spend a major portion of their program working with faculty members on shared research and scholarship.

The Ph.D. program requires a minimum of 81 credit hours beyond the bachelor's degree and includes the following requirements:

Professional courses: 15 credits

Program knowledge base: 30 credits

Research: 15 credits

Electives: 9 credits

Dissertation: 12 credits

Candidates may, with the approval of the committee, transfer up to 30 credit hours from previous graduate-level coursework in a closely related field.

For additional information about specific required courses for graduate degrees in education with an option in instructional technology, please visit the program Web site.

### Learner Outcomes

1. Academic Knowledge: Students will demonstrate a deep understanding of knowledge related to the nature, function and scope of instructional technology; historical, philosophical and sociological foundations; research; and program processes including planning, development, delivery, and assessment/evaluation.
2. Design: Students will demonstrate how to determine organization and learner needs, specify conditions for learning, and conduct task analyses, instructional sequencing, delivery, and project and resource management. Students will also demonstrate how visual elements, information literacy, and delivery media affect message design in traditional and online environments.
3. Development: Students will demonstrate how to convert design plans into physical and computer-based resources aligned to professional learning goals, standards, and objectives. They will also demonstrate how to deliver these resources via physical and electronic media.
4. Evaluation: Students will demonstrate skills required to conduct both formative and summative assessments of instructional episodes and resources.

These include problem analysis, expert review, usability testing, and instrument development and validation.

5. Practical Competence: Students will demonstrate the ability to translate academic knowledge into expert practice related to their professional roles and specialized areas of interest.
6. Professional Engagement: Students will demonstrate intellectual engagement and a reflective stance with instructional technology practices through creative and scholarly pursuits, advisor research, participation and presentations in professional associations, and related activities.

## Instructional Technology (ITEC)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

**1000. Visual Literacy for Life and Learning. 4. [I,L◀▶(none)]** Engages students in the discussion and practice of communicating with visual resources. Students do not need to be artistic to succeed. Emphasis is placed on 1) using visuals for communication in formal and informal educational environments, and 2) the responsible use of visuals as discerning global citizens.

**1101. First-Year Seminar. 3. [(none)◀▶FYS] 2360. Teaching with Technology. 1-3 (Max. 3). [L◀▶(none)]** Introduction to effective utilization of computers and other instructional technologies for instruction; software/hardware selection; integrated, professional and instructional applications as applied to all areas and levels of P-12 education. Prerequisites: minimum 2.5 cumulative UW GPA.

**4010 [4120]. Instructional Technology. 3.** An introductory survey course in instructional technology. Covers psychological principles in communication theory, message design and instructional theory with emphasis on the application of technology toward achieving communications objectives. Includes hands-on experience with current presentation tools and techniques for a variety of instructional deliveries. Dual listed with ITEC 5010. *Prerequisite:* junior standing.

**4030. Introduction to Online Teaching. 3.** Includes basic theory, techniques, strategies of teaching and managing the online environment. Covers foundations and domains of online teaching. Emphasizes online learning issues, topics, and practices. Builds a knowledge base in topics such as the selection and integration of distance learning technologies

in teaching and providing learner support. Dual listed with ITEC 5030. *Prerequisite:* senior standing or 12 hours of education.

**4220. Materials Production I. 2.** The first in a series of laboratory experiences aimed at providing teachers, administrators and production specialists with skills in the design and production of instructional materials. Focuses on the basic processes (i.e. mounting, lettering, coloring, illustration, converting and duplicating). A materials fee will be assessed. May be used toward the practical and applied arts requirement. *Prerequisite:* ITEC 4120. (Offered based on sufficient demand and resources)

**4340 [4400]. Technology Integration in Teaching. 3.** This course is an intermediate practice in theory and application of integrating instructional technology into all types of classroom settings. Issues and topics include teaching and learning with technology, designing materials and activities for use with various technologies, and the role that technology plays in the delivery of instruction. *Prerequisite:* ITEC 2360 or equivalent.

**4360. Advanced Instructional Computing. 3.** For graduate students and teachers interested in learning how to appropriately use microcomputers (CBE, CAI, CBI and CMI) in the classroom and as a tool in their disciplines. Methods of using microcomputers to improve learning, retention, motivation and higher order thinking skills are examined. Systems for classroom management and criteria for selection of hardware and software are covered. A variety of software will be evaluated and used in content specific areas. *Prerequisite:* graduate standing.

**4740. Field Studies In \_\_\_\_\_. 1-5 (Max. 12).** This course is offered only through extension services. It is broad and flexible and can be utilized in numerous situations to meet local needs. Credit in this course is not applicable toward advanced degrees. *Prerequisite:* junior standing. (Please note that any course offered by the College of Education with the number 4740 is not applicable toward advanced degrees)

**4880. Individual Problems. 1-3 (Max. 9).** A course providing flexible credit for seniors who are interested in investigating problems in instructional technology. *Prerequisites:* 12 hours of education and consent of instructor.

**5000. Intro to the Field of Instructional Technology. 3.** This course details faculty expectations and students' responsibilities in instructional technology graduate degree programs. It builds a knowledge base about program milestones, library research, APA writing guidelines, academic journals, and professional opportunities. ePortfolios are introduced and

initiated to assess student progress over time. *Prerequisite:* graduate standing in Instructional Technology.

**5010. Instructional Technology. 3.** An introductory survey course in instructional technology. Covers psychological principles in communication theory, message design and instructional theory with emphasis on the application of technology toward achieving communications objectives. Includes hands-on experience with current presentation tools and techniques for a variety of instructional deliveries. Dual listed with ITEC 4010. *Prerequisite:* junior standing.

**5020. Technology and Distance Education. 3.** A survey of the uses of telecommunication systems and other technologies in distance education. Covers instructional strategies, management concerns, and special issues associated with distance learning programs. *Prerequisite:* graduate standing and consent of instructor.

**5030. Introduction to Online Teaching. 3.** Includes basic theory, techniques, strategies of teaching and managing the online environment. Covers foundations and domains of online teaching. Emphasizes online learning issues, topics, and practices. Builds a knowledge base in topics such as the selection and integration of distance learning technologies in teaching and providing learner support. Dual listed with ITEC 4030. *Prerequisite:* senior standing or 12 hours of education.

**5070. Trends In Instructional Technology. 1-3 (Max. 6).** Provides reading, discussion, research and the opportunity to critically appraise potential methods, software, and hardware in the field of educational communications and technology. *Prerequisite:* 12 hours of education, graduate standing, and consent of instructor.

**5090. Masters Capstone. 3.** Provides exposure to situations students will likely encounter professionally. It establishes a forum where students apply and refine theories, principles, and skills learned during their programs. Students examine and critique current scholarship and document general degree specific competencies. Cross listed with ADED 5090. *Prerequisites:* Check with advisor and complete required sequence of courses for Educational Administration (Adult and Postsecondary Education) or Instructional Technology masters degree programs prior to enrollment.

**5120. Media Workshop. 1-6 (Max. 6).** Specialized experience in selected areas such as computer technology, multi-image, slide/tape, audio and instructional design. Emphasizes experimental use of materials and development of learning software. The workshop is

provided on demand and is flexibly organized and scheduled to meet prevailing needs. *Prerequisite:* ITEC 4220.

**5160. Introduction to Instructional Design. 3.** An introduction to theory and practice of instructional design. Intensive study of the instructional design process and application of the process to solve an instructional problem. *Prerequisite:* graduate standing.

**5320. Message Design. 3.** Introduces theoretical framework and skills necessary to evaluate and create visual representations of information. Topics of application include visual literacy, learning theories, instructional design, instructional technology, and information presentation. *Prerequisite:* graduate standing.

**5350. Multimedia Development. 3.** An introduction to techniques, software, and applications used in the design, manipulation, and development of multimedia artifacts for instructional purposes. This course includes accelerated, hands-on activities to practice and apply message design principles in multimedia settings. *Prerequisite:* graduate standing.

**5470. Instructional Video. 3.** An introductory course for teachers, media specialists, administrators, and others interested in planning, producing, and using instructional video. *Prerequisites:* graduate standing and consent of instructor.

**5480. Short Course. 3.** Used to provide offerings in special topics in instructional technology on the basis of need. *Prerequisites:* graduate standing and consent of instructor.

**5510. Communication in Distance Education. 3.** An introduction to the theory and practice of using communication tools for distance education purposes. Instructional issues related to the design, development, use, and evaluation of communication tools in public school, business, and other distance delivery settings are emphasized. *Prerequisite:* graduate standing.

**5550. Theory of Change. 3.** Explores the literature and research base within the theories, models, and processes of change, the diffusion of innovations, and the human side of educational reform. Learners explore practical applications of theoretical and research findings to behavioral change, diffusion of innovations, and principles and practices of planned change. *Prerequisite:* graduate standing.

**5560. Design and Development of Instructional Systems. 3.** Advanced study in instructional systems theory and design. Study and application of instructional design models used in education and training. *Prerequisite:* ITEC 5160, graduate standing, and consent of instructor. Previous course work in educational psychology/learning theory is desirable.

**5580. Supervised Internship. 1-8 (Max. 12).** An internship experience may be required as part of the planned program in instructional technology. A maximum of eight hours may be counted in meeting the minimum requirements of a graduate degree, but additional credit may be taken beyond this limit for the recording of appropriate supervised experience. This course may not be substituted for practice public school teaching or vice versa. *Prerequisites:* 12 hours of ITEC, consent of instructor and graduate standing.

**5660. Interactive Learning Systems. 1-3 (Max. 6).** Covers all of the necessary elements to design and evaluate effective and efficient interactive learning systems. *Prerequisites:* ITEC 5160 or equivalent, graduate standing, and consent of instructor. Previous course work in educational psychology/learning theory is desirable.

**5760. Instructional Design Applications. 3.** Students engage in the application of principles of instructional design in a real-world setting. Students will be involved in classroom and field experience. *Prerequisite:* ITEC 5160 or 5560.

**5850. Issues, Practices, and Research in Instructional Technology. 3.** A survey course covering issues, practices, and associated research in instructional technology. *Prerequisite:* graduate standing.

**5870. Seminar. 1-3 (Max. 6).** Advanced students in education work together, intensively, on current issues and problems relevant to instructional technology, and participate in systematic, critical interpersonal evaluations. *Prerequisites:* graduate standing and consent of instructor.

**5880. Special Problems. 1-6 (Max. 9).** Provides a broad perspective through selected reading material and, wherever possible, the student collects and uses original information from a practical school situation. All work is done independently under the direction of a faculty member. As many conferences are held as necessary to assure successful completion of the project. *Prerequisites:* graduate standing and consent of instructor and consent of department.

**5890. Directed Professional Study. 1-6 (Max. 9).** Similar to ITEC 5880 and provides additional opportunity for students to pursue advanced degree work through independent research. Projects are done under the direction of a graduate faculty member. *Prerequisites:* graduate standing and consent of instructor and consent of department.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and

gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).**

Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrollment in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Designed for students who are involved in research for their dissertation project. Also used for student whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Library Science (LIBS)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

**2000. Libraries and Librarianship. 2.** A study of the historical development of the library and its role as a social institution. Types of libraries and services, standards, current trends, professional training, and status and responsibility of the librarian are covered. It is beneficial to all who plan to do library work or who are working toward certification in library-media. (Offered based on sufficient demand and resources)

**3010. Research from a Distance. 1. [L♦♦(none)]** Students locate, evaluate, and synthesize free and fee-based information resources used in academic and work environments, with a special focus on assessing information remotely. Course assignments are customized to student's academic major and career goals. Students discuss ethical and legal issues surrounding information use. *Prerequisites:* ENGL 1010 or equivalent; junior standing.

**4320. Selection of Instructional Materials. 3.** A study of basic principles and practices in the selection of print and non-print materials

for utilization in school and public libraries. Emphasis is given to the evaluation of materials in light of community needs and principles of intellectual freedom. Dual listed with LIBS 5320. *Prerequisite:* 20 hours of general education (liberal arts). (Offered based on sufficient demand and resources)

**4340. Administration of the School Library-Media Center. 3.** Deals with finance, housing, personnel, the collection, records and services of the school library media center. Instruction in the use of the library and publicity or educational interpretation concerning the library are also discussed. Dual listed with LIBS 5340. *Prerequisites:* LIBS 4320, 4380, major in educational administration. (Offered based on sufficient demand and resources)

**4360. Reference and Bibliography. 3.** An introduction to the basic materials used in reference and information services. The philosophy of reference services is presented with particular attention to the needs of schools, community colleges and public libraries. Dual listed with LIBS 5360. *Prerequisite:* 20 hours of general education (liberal arts). (Offered based on sufficient demand and resources)

**4380. Cataloging and Classification. 3.** Introduction to the theories and practices of cataloging and classification. Emphasis is on the Dewey Decimal system; subject cataloging from the Sears headings; descriptive cataloging of monographs, serials, and non-print materials; filing rules. Practice in cataloging and classification of materials. Dual listed with LIBS 5380. *Prerequisite:* 20 hours of general education (liberal arts). (Offered based on sufficient demand and resources)

**4520. Library Practice. 2-8 (Max. 8).** Provides an overview of library organization, administration and service by capitalizing upon the utilization of practical experiences in dealing with everyday problems of the library. Application of principles learned in the various library courses will be stressed. Students must contact department the semester prior to enrollment for authorization to enroll in the course. This course serves as student teaching experience for students wishing to be endorsed in library science. *Prerequisite:* LIBS 4340.

**5320. Selection of Instructional Materials. 3.** A study of basic principles and practices in the selection of print and non-print materials for utilization in school and public libraries. Emphasis is given to the evaluation of materials in light of community needs and principles of intellectual freedom. Dual listed with LIBS 4320. *Prerequisite:* 20 hours of general education (liberal arts).

**5340. Administration of the School Library/Media Center. 3.** Deals with finance, housing, personnel, the collection, records, and services of the school library/media center. Instruction in the use of the library and publicity or educational interpretation concerning the library are also discussed. Dual listed with LIBS 4340. *Prerequisite:* LIBS 4320/5320, 4380/5380, or major in educational administration.

**5360. Reference and Bibliography. 3.** An introduction to the basic materials used in reference and information services. The philosophy of reference services is presented with particular attention to the needs of schools, community colleges and public libraries. Dual listed with LIBS 4360. *Prerequisite:* 20 hours of general education (liberal arts).

**5380. Cataloging and Classification. 3.** Introduction to the theories and practices of cataloging and classification. Emphasis is on the Dewey Decimal system; subject cataloging from the Sears headings; descriptive cataloging of monographs, serials, and nonprint materials; filing rules. Practice in cataloging and classification of materials. Dual listed with LIBS 4380. *Prerequisite:* 20 hours of general education (liberal arts).

**5440. Information Technology. 3.** Provides information to help learners efficiently access information electronically. Philosophical, ethical, and management issues as well as technical information on the various mechanisms for electronic access now and in the near future are presented. The analysis of needs combined with knowledge of electronic tools for the purpose of efficiently meeting the information needs of clientele is stressed, as well as knowledge of the appropriate use of electronic products for more specific problems/projects. Cross listed with ADED 5440. *Prerequisite:* graduate standing and/or consent of instructor.

**5520. Teaching the Use of the Library. 2.** Methods for teaching students basic techniques for effective use of library media center resources. Integration of library media center instruction with the total instructional program is emphasized. Relationship between stages of cognitive and other development and appropriate learning activities. *Prerequisite:* LIBS 4320/5320 and LIBS 4380/5380.

**5870. Seminar. 1-3 (Max. 6).** Advanced students in Library Science work on current issues and problems in library service, management, literature, or uses of technology in library settings in a critical context. *Prerequisite:* Course work in library science at the 4000/5000 level; graduate status and/or consent of instructor.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* Advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes. *Prerequisite:* graduate standing.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrollment in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* Graduate standing.

## Special Education

The special education programs are designed to prepare teachers to work with students with varied learning and behavior needs. Students may choose from one of three programs: a master of arts in education with an option in special education or a special education endorsement program leading to eligibility for K-12 special education generalist endorsement through the Wyoming Professional Teaching Standards Board (does not lead to a master's degree). A Special Education Director Endorsement Program is available as well.

### Program Specific Admission Requirements

In addition to meeting the admission requirements of the university, candidates must also provide a current resume, a copy of current Wyoming Teaching Certificate, a signed Special Education Program Prospectus, a writing sample, three letters of recommendation, and undergraduate and graduate transcripts. A bachelor's degree, with a minimum cumulative

GPA of 3.25, from an accredited institution is also required. Please see the Special Education website for more details on these requirements.

### Program Specific Degree Requirements

Students may choose to complete the program on a part-time or full-time basis. All Special Education courses are offered either online or through video-conferencing sites within Wyoming only.

### Program Courses

EDEX 5100	.....3
EDEX 5071	.....3
EDEX 5080	.....3
EDEX 5355	.....3
EDEX 5720	.....3
EDEX 5200	.....3
EDEX 5110	.....3
EDEX 5120	.....3
EDEX 5150	.....3
EDEX 5870	.....2
EDEX 5870	.....2
EDEX 5000	.....3

### K-12 Endorsement/Certificate Program

The special education endorsement program requires a total of 34 credit hours and does not require a culminating activity.

### Master's Program

The Master's degree program requires a culminating activity. This activity may take a variety of forms but is either a Plan A (thesis) or a Plan B (project).

Students completing a Plan A will write a thesis that involves conducting a qualitative or quantitative study. This culminating activity should add new information and content to the field and is primarily for students who wish to learn more about the research process or who wish to continue their education toward a doctoral degree. The student's committee must approve the culminating activity as well as the topic. If a student chooses to write a Plan A paper, they must take either EDEX 5150 or EDRE 5550 and then also EDRE 5530 plus 4 additional thesis credit hours. The program requires 41 total credit hours.

Students completing a Plan B have several options from which to choose their culminating activity. These include: a topical paper, an action research or case study investigation, an oral examination, the development of a complete grant application, or the development of a professional product (e.g. curriculum). The student's committee must approve the culmi-

nating activity as well as the topic. If a student chooses to write a Plan B paper, the student can choose between EDEX 5150 (Classroom Research), EDRE 5530 (Introduction to Research), or EDRE 5550 (Action Research). The program requires 34 total credit hours.

### Special Education Director Endorsement Program

Students who successfully complete a University of Wyoming Principal's Certificate in Education Leadership and a University of Wyoming Master's Degree in Education (Special Education) can apply for endorsement as a Director of Special Education through Wyoming Professional Teaching Standards Board.

### Program Details

The endorsement program requirements are available by completing both the Special Education Master's program and the Educational Leadership Principal Certificate program. The program is offered through the UW Outreach School using distance delivery such as video-conferencing, online, intensive weekends, or combinations of delivery methods. Upon completion of this program students are eligible to apply to the Wyoming Professional Teaching Standards Board for endorsement as a Director of Special Education.

Applicants who hold a BA/BS degree and have a Wyoming teaching certificate, or have submitted an application for a Wyoming teaching certificate, are eligible to apply for admission to this graduate program. Applicants who do not have a Special Education background will need to take a Special Education foundation course prior to beginning the program coursework.

Students expecting to obtain this endorsement must complete both the Special Education Master's courses and also the Educational Leadership Certification courses.

### Learner Outcomes

Upon completion of the Master of Arts or the K-12 Certificate program in Special Education, the candidates will demonstrate their knowledge and skills in:

1. The foundations of special education, to include: evidence-based principles and theories, relevant laws and policies, diverse and historical points of view, and issues of human diversity.
2. The development and characteristics of learners, to include: a demonstrated respect of similarities and differences among learners with exceptional con-

ditions and the use of this knowledge to respond to the varying abilities and behaviors of individuals.

3. Individual learning differences, to include: the effects that an exceptional condition can have on an individual's learning as well as understanding, and how language, culture, and family backgrounds interact with the individual's exceptional condition.
4. Instructional strategies, to include: evidence-based instructional strategies by which to individualize instruction, promote positive learning results, special curriculum materials, and the appropriate modification of the learning environment.
5. The creation of learning environments and social interactions, to include: active student engagement, the value of diversity, supporting environments that encourage independence, providing help to general education colleagues, and methods to intervene with individuals with exceptional learning and behavioral needs in crisis.
6. Language, to include: typical and atypical language development, strategies to teach communication skills, and strategies and resources to facilitate the understanding of subject matter for individuals with exceptional learning needs whose primary language is not English.
7. Instructional planning, to include short and long range individualized instructional plans and goal setting which are developed and modified using data based decisions.
8. Assessment, to include: multiple types of assessment information, principles of measurement and assessment, measurement theory and practice, formal and informal assessment, and regular and continuous progress monitoring.
9. Professional and ethical practice, to include: understanding and following legal and ethical principles relative to evidence-based practices.
10. Collaboration, to include: collaborative support of families, educators, related service providers, and personnel from community agencies, as well as the supervision of paraprofessionals, all in culturally responsive ways.

## Special Education (EDEX)

### 1000. Hot Topics in Special Education.

**1.** Academic, content-based course designed for first-year students, focuses on the critical thinking skills necessary to understand, analyze, and produce knowledge within the framework of educational inquiry. Serves as an introduction to the intellectual community of the university. Themes discussed focus on special education issues as they relate to ourselves, our schools, and our place in the community. *Prerequisites:* none.

**1010. Overview of Special Education. 3.** Provides prospective special education teachers an overview and a broad knowledge base of the special education field. *Prerequisite:* consent of instructor.

**2120. Special Education Intervention Process. 3.** Introduces special education and education intervention and management model. Discusses models designed to prepare generalist and multidiscipline special education practitioners to conduct systematic and successful intervention with learning and/ or behavior problems. *Prerequisites:* overall GPA 2.5 and consent of instructor.

**2350. Prescriptive Teaching Practicum. 1-8 (Max. 8).** Encompasses live, on-going, supervised practicum experience with regular students and students with special needs. Heavily emphasizes observation and direct instructional involvement with students with a range of special needs. *Prerequisites:* overall GPA 2.5 and consent of instructor.

**2484. Introduction to Special Education. 3.** Designed to meet the needs of education majors for a required course in special education. *Prerequisite:* EDST 2450 completed with a C or better and an institutional GPA of 2.50 or higher.

**3230. Direct Instruction. 3.** Applies specific instructional delivery skills to a variety of educational settings and disabilities. *Prerequisite:* consent of instructor.

**3430. Special Education Curriculum Materials. 3.** Involves assessment, adaptation and application of curriculum materials in the education of students with special needs. *Prerequisites:* 2.5 overall GPA, 2.5 GPA in major, junior standing and consent of instructor.

**3440. Special Education Assistive Technology, Case Management, and Transition. 3.** Addresses a variety of assistive technology applications for use with individuals with disabilities. Discusses case management techniques and transition components in special education. *Prerequisites:* overall GPA 2.5, 2.5 GPA in major and consent of instructor.

**3470. Special Education Law. 3.** Provides prospective special education teachers and support personnel with overview of important case and statutory law in special education.

*Prerequisites:* 2.5 overall GPA, 2.5 GPA in major, junior standing and consent of instructor.

**3550. Mental Disabilities. 3.** Provides general information and assessment/teaching techniques used with children with mental retardation. *Prerequisites:* 2.5 overall GPA, 2.5 GPA in major, junior standing and consent of instructor.

**3560. Behavior Management. 3.** Provides systematic and measurable approaches for the management of behavior and motivation of hard-to-teach students and students with special needs. *Prerequisites:* 2.5 overall GPA, 2.5 GPA in major, junior standing and consent of instructor.

**3660. Educational and Psychological Assessment. 3.** Introduces students to specific psycho-educational and curriculum-based measures, procedures and instruments as they relate to teaching and programming for students with disabilities. Emphasis is placed on both formal and informal assessment tools. *Prerequisites:* 2.5 overall GPA, 2.5 GPA in major, junior standing, consent of instructor and unit coordinator.

**4190. Identification and Education of Gifted and Talented Students. 3.** Provides students with the means to identify gifted and talented students to derive maximum benefit from educational programs. *Prerequisites:* 2.5 overall GPA, 2.5 GPA in major and consent of instructor.

**4380. Special Education Teaching Practicum. 4.** Encompasses live, on-going, supervised practicum experience with regular students and students with special needs. Emphasizes observation and direct instructional involvement with range of students with special needs in a variety of settings. *Prerequisites:* 2.5 GPA and consent of instructor.

**4500. Residency in Teaching. 1-16 (Max. 24).** Comprises the final professional academic semester of the teacher education program. A full-time residency, including a period of being intensively mentored and coached, a period of independent teaching and a period of team teaching. Available for S/U only. Cross listed with EDEL 4500 and EDSE 4500. *Prerequisites:* 2.75 cumulative GPA, 2.5 GPA in major content courses, completion of all content courses, successful completion of Phase IIIa specific pedagogy and practicum, complete review of the prospective teacher's record.

**4570. Learning Disabilities. 3.** Relates theoretical and practical aspects of learning disabilities to the classroom, teaching, various

treatment techniques, as well as curriculum match and materials. *Prerequisites:* 2.5 overall GPA, 2.5 GPA in major, junior standing and consent of instructor.

**4590. Emotional Disabilities. 3.** Relates theoretical and practical aspects of emotional disturbance to classroom teaching, curriculum match and materials. *Prerequisites:* 2.5 overall GPA, 2.5 GPA in major, junior standing and consent of instructor.

**4740. Field Studies in \_\_\_\_\_ 1-12 (Max. 12).** Offered only through the office of Graduate and Continuing Professional Education. Broad and flexible; can be utilized in numerous situations to meet local needs. Credit in this course is not applicable toward advanced degrees. *Prerequisite:* consent of instructor.

**4770. Consultant Teacher Strategies. 3.** Represents an opportunity for students to examine and explore consultation concepts in the field of special education. *Prerequisites:* 2.5 overall GPA, 2.5 GPA in major, junior standing and consent of instructor.

**4880. Parent and Paraprofessional Training. 3.** Provides special education teachers specific techniques for training parents and paraprofessionals in the area of special education. *Prerequisites:* 2.5 overall GPA, 2.5 GPA in major, junior standing and consent of instructor.

**4970. Seminar in Field Experiences. 1-5 (Max. 5).** Encompasses teaching strategies and problems for special education majors. *Prerequisite:* consent of instructor.

**5000. Collaboration and Professional Interdisciplinary Relationships. 3.** Represents an opportunity for students to examine and explore a range of consultant concepts in the field of Special Education. *Prerequisite:* Admission to the program or consent of instructor.

**5070. Trends In Special Education. 1-8 (Max. 8).** Designed to provide experience with timely special education issues. *Prerequisite:* consent of instructor and graduate standing.

**5071. Teaching Students with Mild and Moderate Disabilities. 3.** Relates the theoretical, research, and practical aspects of mild-moderate disabilities to the student, teacher, classroom, parents, paraprofessionals, and other school personnel and community agencies, all in an effort to help understand and remediate student instructional and behavioral presenting problems. *Prerequisite:* Admission to program or consent of instructor.

**5080. Teaching Students with Severe and Low Incidence Disabilities. 3.** Designed to provide teachers with the repertoire of instructional, curricular, and behavior analytic skills needed to effectively serve students with severe and low-incidence disabilities. An emphasis

on inclusive education and promoting access to the general curriculum will be stressed. *Prerequisites:* Admission to program or consent of instructor.

**5100. Special Education Practicum I. 3.** Designed to allow the student to practice skills and competencies reflected in the Council for Exceptional Children standards. The activities are designed to follow the Wyoming Teaching Standards for Special Education Certification. *Prerequisite:* Admission to program or consent of the Instructor.

**5110. Positive Behavior Support and Management. 3.** Relates the theoretical, research, and practical strategies of behavior change models to students, teachers, parents, and paraprofessionals, in order to understand and remediate student behavior presenting problems, to include the application of systematic Behavior Management plans, BIPs, FBAs, BSPs, and school wide PBIS. *Prerequisites:* Admission to program or consent of instructor; EDEX 5071.

**5120. Academic Instruction in General Education for Students with Disabilities. 3.** Offers teachers appropriate practices and procedures for accommodating children with disabilities in their general education classroom. The focus is on moving from academic and nonacademic assessments to appropriate teaching and learning in the general education classroom environment. *Prerequisite:* Admission to program or consent of instructor.

**5150. Research Applications in the Classroom. 3.** Methodology for conducting applied research projects in classroom settings will be discussed. A variety of "classroom-friendly" experimental designs will be examined. In particular, the value of single-subject research in evaluating educational programs and serving as a rigorous, experimentally sound methodology are discussed. *Prerequisite:* Admission to program or consent of instructor.

**5200. Special Education Practicum II. 3.** Designed to allow the student to practice skills and competencies reflected in the Council for Exceptional Children standards. The activities are designed to follow the Wyoming Teaching Standards for Special Education Certification. *Prerequisite:* Admission to program or consent of instructor; EDEX 5100.

**5250. Assistive Technology and Transition. 2.** Addresses assistive technology considerations for students with disabilities. Assessment, planning, selection, use, and evaluation of options will be emphasized. *Prerequisites:* Admission to program or consent of instructor.

**5260. Transition Planning. 2.** Examines the transition and post-high school options available for students with disabilities and in

accordance with the requirements of the Individuals with Disabilities Education Act. Emphasis will be placed on assessment, planning, and evaluation of the transition components. *Prerequisite:* Admission to program or consent of instructor.

**5300. Foundations Of Special Education. 3.** Part of the graduate Diagnostic-Prescriptive Teaching training program. Course content involves the application of prescriptive teaching and programming strategies which permit formal and informal assessment of, and the systematic intervention with, learning or behavior problems. *Prerequisite:* graduate standing.

**5355. Assessment. 3.** Involves the history, ethics, data collection procedures, psychometric understanding, and interpretation of selected formal and informal psycho-educational tests; the relationship to a comprehensive evaluation and IDEA eligibility requirements; and the application of assessment results to the practical remediation of student instructional and behavioral presenting problems. *Prerequisite:* Admission to program or consent of instructor.

**5370. Improvement of Instruction in Special Education. 1-8 (Max. 8).** Designed to enhance problem solving ability regarding special education practices. *Prerequisite:* consent of instructor.

**5410. Short Course. 1-8 (Max. 12).** Provides the opportunity for intensive study of specific topics in special education. *Prerequisite:* consent of instructor and graduate standing.

**5490. Individual Problems. 1-6 (Max. 6).** Provides flexible credit for students who wish to study a special problem related to prescriptive intervention. *Prerequisite:* 12 hours of education and consent of instructor.

**5550. Supervised Internship. 1-8 (Max. 12).** An internship experience may be required as part of the planned program in special education for the master's, education specialist, or doctoral degrees. *Prerequisite:* 8 hours of graduate level special education courses in the College of Education, consent of department head, and graduate standing.

**5680. Prescriptive Teaching Practicum. 1-8 (Max. 8).** Graduate practicum/internship, the content of which involves supervised education experience in a special education classroom. *Prerequisites:* graduate status and consent of instructor.

**5720. Special Education Law. 3.** Provides prospective special education teachers and support personnel with overview of important case and statutory law in special education. *Prerequisites:* Admission to program or consent of instructor.



**5730. Severe and Profound Handicaps. 3.** Relates current research and practice to the systematic assessment, education and management of individuals who are severely and/or profoundly disabled. *Prerequisites:* 3 semester hours of graduate course work in special education, 3.0 graduate GPA, and consent of instructor and department head.

**5790. Administration of Special Education. 3.** Relates current research and practice to the administration of special education programs. *Prerequisites:* 3 semester hours of graduate course work in special education, 3.0 graduate GPA, and consent of instructor and department head.

**5870. Seminar. 1-6 (Max. 6).** Represents an opportunity for students to examine and explore advanced concepts of prescriptive teaching. *Prerequisites:* consent of instructor and graduate standing.

**5880. Special Problems. 1-6 (Max. 9).** *Prerequisite:* consent of instructor and graduate standing.

**5890. Directed Professional Study. 1-9 (Max. 9).** Represents an opportunity to explore a wide range of special problem topics within the scope of diagnostic-prescriptive teaching. *Prerequisites:* consent of instructor and graduate standing.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

## Professional Studies (PRST)

**5070. Introduction to College Teaching. 3.** This course is designed to provide students with an understanding of instructional theory and experiences in applying teaching and assessment methods relevant to the role of an educator in higher education. Linking theories, perspectives, and principles of effective teaching and learning to practice in higher education is a priority of the course. Practicing and experiencing “hands-on” activities will be prime formats of the class. *Prerequisite:* graduate standing.

**5610. Introduction to Doctoral Studies. 3.** Introduce incoming doctoral students to the fundamentals of doctoral study for the Ph.D. degree. Includes developing an understanding of higher education, the organization and purposes of doctoral programs, and the exploration of the roles of teaching, research, and service at the university. *Prerequisite:* Admission to the program.

**5880. Special Problems. 1-9.** Provides a broad perspective through selected reading material. Wherever possible the student collects and

used original information from a practical work situation. All work is done independently under the direction of a faculty member. A minimum of three conferences are held as necessary to assure successful completion of the project. *Prerequisites:* consent of instructor and department head, and graduate standing.

**5890. Directed Professional Study. 1-9.** Similar to PRST 5880. Provides additional opportunity for students to pursue advanced graduate work through independent research. Projects are done under the direction of a graduate faculty member. *Prerequisite:* graduate standing.

**5900. Practicum in College Teaching. 1-3 (Max. 9).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 99).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 99).** *Prerequisite:* advanced degree candidacy

**5960. Thesis Research. 1-12 (Max. 99).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrolled in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 99).** Graduate level course designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrolled in a graduate level degree program.

**5990. Internship. 1-12 (Max. 99).** *Prerequisite:* graduate standing.

## Department of Secondary Education

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Department Head: Kate Muir Welsh

### Professors:

**VICTORIA RIDGEWAY GILLIS**, B.S. North Georgia College 1968; M.A.T. Emory University 1969; Ph.D. University of Georgia 1994. Professor of Secondary Education 2012.

**LESLIE S. RUSH**, B.S. Texas A&M—Commerce 1984; M.Ed. 1996; Ph.D. University of Georgia, 2002; Professor of Secondary Education 2014, 2002. Associate Dean of Undergraduate Programs 2013.

**TIMOTHY F. SLATER**, B.S. Kansas State University 1989; B.S. Ed. 1989; M.S. Clemson University 1991; Ph.D. University of South Carolina 1993; Professor of Secondary Education 2008.

### Associate Professors:

**LYDIA DAMBEKALNS**, B.A. College of William and Mary 1981; M.Ed. Pennsylvania State University 1994; Ph.D. 1996; Associate Professor of Secondary Education 2002, 1996.

**LINDA HUTCHISON**, B.A. Humboldt State University 1978; M.A. Stanford University 1986; Ph.D. University of Washington 1992; Associate Professor of Secondary Education 2000, 1993.

### Assistant Professors:

**ANDREA C. BURROWS**, B.S. University of Central Florida 1992; M.S. Florida State University 1994; Ed.D. University of Cincinnati 2011; Assistant Professor of Secondary Education 2012.

**J. CHRIS HAYNES**, B.S. Tarleton State University 1986, 1991; M.S. Tarleton State University 2007; Ph.D. Oklahoma State University 2010; Assistant Professor of Secondary Education 2012.

**MARK HELMSING**, B.S. Indiana University 2000; Ph.D. Michigan State University 2014; Assistant Professor of Secondary Education 2015.

**JASON D. HENDRYX**, B.A. University of Washington 1991; M.A. 2003; Ph.D. 2008; Assistant Professor of Secondary Education 2013.

### Assistant Lecturer:

**ROD THOMPSON**, B.A. University of Nebraska at Kearney 1991; M.A. University of Northern Iowa 1998; Assistant Lecturer 2012, 2009.

### Temporary Assistant Professor:

**JASON KATZMANN**, B.S. Texas Women's University 1994; M.A. Colorado College 2000; Ph.D. University of Northern Colorado 2007; Temporary Assistant Lecturer of Secondary Education 2007.

The undergraduate degree program in secondary education includes course work in the University Studies Program and additional content areas along with a sequence of professional education courses and field experiences with classroom teachers. Students select a concentration from agriculture, art, English, technical education, mathematics, modern languages, science, or social studies.

Masters and Doctoral degrees in education are available. The Secondary Education Department joins with the departments of Educational Studies and Elementary and

Early Childhood Education to offer graduate programs in Curriculum and Instruction. Additional information can be found on the Curriculum and Instruction Department's web page ([www.uwyo.edu/c\\_i](http://www.uwyo.edu/c_i)).

## Secondary Education (EDSE)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

**1000. Exploring Hot Topics in Secondary Education. 2. [I,L♦♦(none)]** Academic, content-based course designed for first year students. Focuses on critical-thinking skills necessary to understand, analyze, and produce knowledge within the framework of educational inquiry. Themes include diversity and other issues found in Secondary Education (e.g. High Stakes testing, inclusion, or school violence). Faculty member's expertise areas within secondary education will determine appropriate themes.

**1010 [EDCI 1010]. Field Experience for Prospective Elementary and Secondary Teachers. 1-4 (Max. 4).** Introductory course in teacher education. Provides an overview of the theory and practice of what is required to become and be a teacher. An initial practicum is included. Cross listed with EDEL 1010. *Prerequisite:* sophomore standing.

**1101. First-Year Seminar. 3. [(none)♦♦FYS]**  
**2000 [EDCI 2000]. Undergraduate Seminar in \_\_\_\_\_. 1-2 (Max. 8).** Designed to discuss strategies and instructional activities used in content courses the students take and to be a linkage between what the prospective teachers study and what they will teach. It provides the opportunity to discuss appropriate activities, strategies and programs in a teaching area related to the content area being studied. Cross listed with EDEL 2000. *Prerequisite:* consent of instructor.

**3010 [EDIE 3010]. Contemporary Philosophies in Technical Education. 1-3 (Max. 3).** Provides industrial education students with a sound contemporary philosophy for curriculum development and instructional planning. Emphasis is placed on current programs, philosophies, history, youth group development and advisory committee activities. *Prerequisites:* 8 credit hours of education course work. (Offered through UW/CC)

**3020. Facilities and Advisery Management. 2-4 (Max. 4).** Students engage in identifying RFP applications and applies for grants that are geared toward the Technical classroom as well as the process of assembling and managing an advisory committee, a required component

of all CTE programs. Prepares Technical Teachers for the non-teaching requirements associated with the CTE programs. *Prerequisites:* junior standing in Technical Education.

**3030. Construction Technology. 3.** Introduces students to the principles and practices of the construction industry, through a combination of classroom and laboratory experiences. In addition, this course outlines the construction content area as taught in the technical education classroom and emphasizes development of curricula materials. *Prerequisites:* 12 hours of technical content courses from an approved list. (Offered through UW/CC)

**3040 [EDIE 3040]. Energy and Power Technology. 3.** A conceptual analysis and synthesis of energy requirements and sources, with emphasis on alternate energy systems. Analysis of energy conversion and the application of mechanical, fluid, thermal and electrical power systems. *Prerequisite:* PHYS 1050 or 1110. (Offered through UW/CC)

**3050 [EDIE 3050]. Communications Technology. 3.** Designed to give students knowledge and experience in the major concepts of graphic communications, including: communication, design, image generation and production practices of modern industry. Also covers curricular and pedagogical concerns related to teaching communications technology at the secondary school level. *Prerequisite:* 12 credit hours of technical content courses from an approved list. (Offered through UW/CC)

**3270. Subject Matter Specific Methods I: Secondary English Education. 3-6 (Max. 6).** Introduction of content and pedagogy in English Education. *Prerequisite:* grade of C or better in EDST 2480.

**3271. Subject Matter Specific Methods I: Secondary Mathematics Education. 3-6 (Max. 6).** Introduction of content and pedagogy in Mathematics Education. *Prerequisite:* grade of C or better in EDST 2480.

**3272. Subject Matter Specific Methods I: Art Education K-12. 3-6 (Max. 6).** Introduction of content and pedagogy in Art Education K-12. *Prerequisite:* grade of C or better in EDST 2480.

**3273. Subject Matter Specific Methods I: Secondary Social Studies Education. 3-6 (Max. 6).** Introduction of content and pedagogy in Secondary Social Studies Education. *Prerequisite:* grade of C or better in EDST 2480.

**3274. Subject Matter Specific Methods I: Music Education K-12. 3-6 (Max. 6).** Introduction of content and pedagogy in Music Education. *Prerequisite:* grade of C or better in EDST 2480.

**3275. Subject Matter Specific Methods I: Secondary Science Education. 3-6 (Max. 6).** Introduction of content and pedagogy in Science Education. *Prerequisite:* grade of C or better in EDST 2480.

**3276. Subject Matter Specific Methods I: Secondary Modern Language Education. 3-6 (Max. 6).** Introduction of content and pedagogy in Modern Language Education. *Prerequisite:* grade of C or better in EDST 2480.

**3277. Subject Matter Specific Methods I: Secondary Technology Education. 3-6 (Max. 6).** Introduction of content and pedagogy in Industrial Technology Education. *Prerequisite:* grade of C or better in EDST 2480.

**3278. Subject Matter Specific Methods I: Secondary Agriculture Education. 3-6 (Max. 6). [WC♦♦(none)]** Introduction of content and pedagogy in Agriculture Education. *Prerequisite:* grade of C or better in EDST 2480.

**3540 [EDCI 3540]. Teaching Reading and Study Strategies in the Content Areas. 2-4 (Max. 4).** Provides students majoring in secondary education programs with a knowledge of reading factors as they relate to various disciplines. Content includes estimating students' reading ability, techniques for vocabulary development, questioning strategies, and developing reading related study skills. *Prerequisites:* junior standing and minimum 12 hours in discipline area.

**3550 [EDCI 3550]. Methods of Teaching: \_\_\_\_\_. 2-5 (Max. 10).** Develops an understanding of methods common to all disciplines. Through reflective inquiry and problem solving students will become involved in teaching practices and techniques. Cross listed with EDEL 3550. *Prerequisites:* EDST 3000, junior class standing, 2.5 minimum cumulative GPA, must maintain grade of C or better in major. (Offered fall, spring and summer)

**4000 [EDUC 4000]. Becoming a Reflective Practitioner: Practicum. 2.** Part of Phase IIIa of the teacher education program. Practicum experience is integral to EDSE 4250 and must be taken concurrently. Cross listed with EDEL 4000. *Prerequisites:* 2.5 cumulative GPA, successful completion of EDST 3000 (grade, interview and portfolio).

**4010. Middle Level Practicum. 2.** Incorporates classroom instruction and field experiences dealing with middle level classroom management, lesson planning/delivery in the context of early adolescent intellectual, physical and psychological domains. Emphasizes grades 5-8. S/U only. *Prerequisites:* EDST 3000, EDCI 4400 (or concurrent enrollment) 2.5 GPA.

**4070 [EDAS 4070, EDVE 4070]. Educational Trends in \_\_\_\_\_.** 1-3 (Max. 6). Provides reading, discussion, research and appraisal of new methods, materials, equipment and experimental programs concerned with improvement of education as it pertains to areas of secondary education: agricultural, art, English, mathematics, middle school, modern language, science, and social studies education. The maximum allowable credit applies to the total offerings under this number. *Prerequisite:* 6 hours of education.

**4250 [EDUC 4250]. Becoming a Reflective Practitioner: Specific Pedagogy in English.** 5-8 (Max. 8). Comprised of content and pedagogy in the student's major teaching field, English education. Must be taken in conjunction with EDSE 4000. *Prerequisites:* 2.5 minimum cumulative GPA, 2.5 minimum GPA in major, successful completion of outcomes in EDST 2000 and 3000, successful completion of specific content courses required in the major and concurrent enrollment in EDSE 4000 is expected.

**4251 [EDUC 4251]. Becoming a Reflective Practitioner: Specific Pedagogy in Mathematics.** 5-8 (Max 8). Comprised of content and pedagogy in mathematics. Must be taken in the same semester as the 2 semester hour course, EDSE 4000. *Prerequisites:* 2.5 minimum cumulative GPA, successful completion of EDST 3000, and concurrent enrollment in EDSE 4000 is expected. (Offered fall semester)

**4252 [EDUC 4252]. Becoming a Reflective Practitioner: Specific Pedagogy in Art Education K-12.** 5-8 (Max. 8). Comprised of content and pedagogy in the student's major teaching field, art education. Must be taken in the same semester as the 2 semester hour course, EDSE 4000. *Prerequisites:* 2.5 minimum cumulative GPA, 2.5 GPA in major, successful completion outcomes in EDST 2000 and 3000, successful completion of specific content courses required in the major and concurrent enrollment in EDSE 4000. (Offered fall semester)

**4253 [EDUC 4253]. Becoming a Reflective Practitioner: Specific Pedagogy in Social Studies Education.** 5-8 (Max. 8). Comprised of content and pedagogy in the student's major teaching field, social studies education. Must be taken in the same semester as the 2 semester hour course, EDSE 4000. *Prerequisites:* 2.5 minimum cumulative GPA, 2.5 GPA in major, successful completion outcomes in EDST 2000 and 3000, successful completion of specific content courses required in the major and concurrent enrollment in EDSE 4000. (Offered fall semester)

**4254 [EDUC 4254]. Becoming a Reflective Practitioner: Specific Pedagogy in Music.** 8. [WC,D(none)] Comprised of content and pedagogy in the student's major teaching field. Must be taken in the same semester as the 2 semester hour course, EDSE 4000. *Prerequisites:* 2.5 minimum cumulative GPA, 2.5 GPA in major, successful completion outcomes in EDST 2000 and 3000, successful completion of specific content courses required in the major and concurrent enrollment in EDSE 4000. (Offered fall semester)

**4255 [EDUC 4255]. Becoming a Reflective Practitioner: Specific Pedagogy in Science.** 5-8 (Max. 8). Provides an integrated approach to the methodology of teaching secondary science. Covers basic concepts of physical sciences with processes as a vehicle to learn about the natural discussion, lesson planning, use of appropriate technology, appraisal of new trends in science education and considerable time implementing ideas in the secondary classroom. *Prerequisites:* 2.5 minimum cumulative GPA, 2.5 GPA in major, successful completion outcomes in EDST 2000 and 3000, successful completion of specific content courses required in the major and concurrent enrollment in EDSE 4000. (Offered fall semester)

**4256 [EDUC 4256]. Becoming a Reflective Practitioner: Specific Pedagogy in Modern and Classical Languages.** 5-8 (Max. 8). Designed to provide an introduction to curriculum and instructional processes in multiple secondary school subjects. General and discipline-specific issue and methods will be addressed. *Prerequisites:* 2.5 minimum cumulative GPA, 2.5 GPA in major, successful completion outcomes in EDST 2000 and 3000, successful completion of specific content courses required in the major and concurrent enrollment in EDSE 4000 is expected. (Offered fall semester)

**4260 [EDUC 4260]. Becoming a Reflective Practitioner: Specific Teaching Methods for Applied Science and Technology.** 5-8 (Max. 8). Comprised of content and pedagogy in the student's major teaching field. Concurrent enrollment in EDSE 4000 practicum as stated in college guidelines is expected. *Prerequisites:* acceptance into the Wyoming Teacher Education Program, satisfactory score on the CAT, 2.5 GPA, class status and completion of certain classes as noted in this bulletin. (Offered fall semester)

**4261 [EDUC 4261]. Becoming a Reflective Practitioner: Specific Pedagogy in Business and Marketing .** 8. Comprised of content and pedagogy in the student's major teaching field, business and marketing educa-

tion. Must be taken in the same semester as the 2 semester hour course, EDSE 4000. *Prerequisites:* 2.5 minimum cumulative GPA, 2.5 GPA in major, successful completion outcomes in EDST 2000 and 3000, successful completion of specific content courses required in the major and concurrent enrollment in EDSE 4000. (Offered fall semester)

**4270. Subject Matter Specific Methods II: Secondary English Education.** 3-6 (Max. 6). [WC(none)] Advanced content and pedagogy in English Education. *Prerequisites:* Grade of C or better in EDSE 3270, Grade of C or better in EDST 3000, 2.75 minimum cumulative GPA, 2.5 minimum GPA in major content courses, Grade of C or better in specific content courses required in the major.

**4271. Subject Matter Specific Methods II: Secondary Mathematics Education.** 3-6 (Max. 6). [WC COM3] Advanced content and pedagogy in Mathematics Education. *Prerequisites:* Grade of C or better in EDSE 3271, Grade of C or better in EDST 3000, 2.75 minimum cumulative GPA, 2.5 minimum GPA in major content courses, Grade of C or better in specific content courses required in the major.

**4272. Subject Matter Specific Methods II: Art Education K-12.** 3-6 (Max. 6). [WC COM3] Advanced content and pedagogy in Art Education. *Prerequisites:* Grade of C or better in EDSE 3272, Grade of C or better in EDST 3000, 2.75 minimum cumulative GPA, 2.5 minimum GPA in major content courses, Grade of C or better in specific content courses required in the major.

**4273. Subject Matter Specific Methods II: Secondary Social Studies Education 3-6** (Max. 6). [WC COM3] Advanced content and pedagogy in Social Studies Education. *Prerequisites:* Grade of C or better in EDSE 3273, Grade of C or better in EDST 3000, 2.75 minimum cumulative GPA, 2.5 minimum GPA in major content courses, Grade of C or better in specific content courses required in the major.

**4274. Subject Matter Specific Methods II: Music Education K-12.** 3-6 (Max. 6). Advanced content and pedagogy in Music Education. *Prerequisites:* Grade of C or better in EDSE 3274, 2.75 minimum cumulative GPA, 2.5 minimum GPA in major content courses, Grade of C or better in specific content courses required in the major. Pass Piano Proficiency (may be done this semester, but must be passed before student teaching). Completed Portfolio reviewed and accepted by music education committee. WB completed (2nd level writing course) with Grade of C or better.

**4275. Subject Matter Specific Methods II: Secondary Science Education. 3-6 (Max. 6).** [WC♦COM3] Advanced content and pedagogy in Science Education. *Prerequisites:* grade of C or better in EDSE 3275, grade of C or better in EDST 3000, 2.75 minimum GPA, 2.5 minimum GPA in major content courses, grade of C or better in specific content courses required in the major.

**4276. Subject Matter Specific Methods II: Secondary Modern Language Education 3-6 (Max. 6).** [WC♦COM3] Advanced content and pedagogy in Modern Language Education. *Prerequisites:* Grade of C or better in EDSE 3276, Grade of C or better in EDST 3000, 2.75 minimum cumulative GPA, 2.5 minimum GPA in major content courses, Grade of C or better in specific content courses required in the major.

**4277. Subject Matter Specific Methods II: Secondary Technology Education. 3.-6 (Max. 6).** [WC♦COM3] Advanced content and pedagogy in Industrial Technology Education. *Prerequisites:* grade of C or better in EDSE 3277, grade of C or better in EDST 3000, 2.75 minimum GPA, 2.5 minimum GPA in major content courses, grade of C or better in specific content courses required in the major.

**4278. Subject Matter Specific Methods II: Secondary Agriculture Education. 3.-6 (Max. 6).** Advanced content and pedagogy in Agriculture Education. *Prerequisites:* grade of C or better in EDSE 3278, grade of C or better in EDST 3000, 2.75 minimum GPA, 2.5 minimum GPA in major content courses, grade of C or better in specific content courses required in the major.

**4279. Subject Matter Specific Methods II: Biological Science Methods for Agricultural Education Majors. 3.** Provide meaningful learning in preparation for a professional career in a secondary school setting, teaching life science courses in addition to agriculture classes. Students will be engaged as active participants in discussions and hands-on science activities. The course is designed to offer experiences to enhance pedagogical content knowledge as well as skills to successfully make science education accessible for all students. Special attention will be given to creating a learning environment that fosters the development of inquiry skills and safety both in the classroom and field settings. *Prerequisites:* Grade of C or better in EDST 3000, 2.75 minimum GPA in major content courses, grade C or better in specific content courses required in the Secondary Biology Endorsement.

**4500 [EDUC 4500]. Residency in Teaching. 1-16 (Max. 24).** Comprises the final professional academic semester of the teacher

education program. A full-time residency, including a period of being intensively mentored and coached, a period of independent teaching and a period of team teaching. Available for S/U only. Cross listed with EDEL 4500 and EDEX 4500. *Prerequisites:* 2.75 cumulative GPA, 2.5 GPA in major content courses, completion of all content courses, successful completion of Phase IIIa specific pedagogy and practicum, complete review of the prospective teacher's record.

**4740 [EDCI 4740]. Field Studies in \_\_\_\_\_ 1-5 (Max. 12).** Offered only through extension services. Broad and flexible and can be utilized in numerous situations to meet local needs. Credit in this course is not applicable toward advanced degrees. Cross listed with EDEL 4740. Offered S/U only. *Prerequisite:* 6 hours of education. (Offered based on sufficient demand and resources)

**4975. [EDCI 4975] Independent Study. 1-3 (Max. 6).** Primarily for upper-division students who can benefit from independent study with minimal supervision. Given to allow interested students to pursue specific aspects of curriculum and instruction. Cross listed with EDEL 4975. *Prerequisites:* 12 hours of education courses and consent of instructor.

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## Agricultural Education

This curriculum provides a diversified background of technical and professional agricultural subjects necessary to prepare teachers of agricultural education for service in the public middle, secondary and post secondary schools. Courses listed below are taken in the Secondary Education Department.

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## Agricultural Education (EDAG)

**4070 [EDAS 4070]. Trends: \_\_\_\_ 2 (Max. 6).** Designed to provide reading, discussion, research, and the appraisal of new methods, materials, equipment, and experimental programs concerned with the improvement of education as it pertains to the areas of vocational education; vocational agriculture, home economics, and trade and industrial education. Each department in the college may make offerings under this number. The maximum allowable credits for each department is 6 semester hours. *Prerequisites:* 6 hours of education.

**4170 [EDAS 4170, EDVE 4170]. Principles of Agricultural Mechanics and Technology. 3.** Content will emphasize those skills commonly taught in Wyoming agricultural education in the secondary school system with an emphasis on advanced gas and plasma weld-

ing theory, small gas engines, and advanced electrical wiring and practices. Designed for students preparing to teach agricultural science in the Wyoming public school system. *Prerequisite:* EDAG 4070 or approval of instructor.

**4180 [EDAS 4180, EDVE 4180]. Techniques of Agricultural Mechanics and Technology. 3.** Techniques of agricultural mechanics and instruction. Content will emphasize those skills commonly taught in the Wyoming school system agricultural mechanics program with emphasis on woodworking, welding theory, agricultural plumbing, and electrical wiring and practices. Designed for students preparing to teach agricultural science in the Wyoming public school system. *Prerequisite:* Junior standing or consent of instructor.

**4970 [EDAS 4970, EDVE 4970]. Individual Problems. 1-3 (Max. 6).** Provides flexible credit for seniors who may need credit for graduation, or for students who wish to undertake intensive study of a special problem identified in a regular class. Offered in areas of vocational education, vocational agriculture, family and consumer sciences, and trade and industrial education. *Prerequisite:* 12 hours of education courses.

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## Technical Education

Technical education is a comprehensive, action-based teacher education program concerned with technical means, their evolution, utilization and significance with industry, its organization, personnel, systems, techniques, resources and products and their social and cultural impact. This program is offered at UW-Casper.

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## Science and Mathematics Teaching Center

453 Wyoming Hall, 766-6381

FAX: (307) 766-3792

Web site: [smtc.uwyo.edu](http://smtc.uwyo.edu)

Director: Jacqueline Leonard

Program Coordinator: Sylvia Parker

The Science and Mathematics Teaching Center (SMTC) is an intercollegiate, interdisciplinary program committed to excellence in science, mathematics, and technology education. Governed jointly by the Colleges of Education and Arts & Sciences, the SMTC, in cooperation with the Wyoming Department of Education and the Professional Teaching Standards Board (PTSB), serves as a science and mathematics education resource and professional development center for the state. The affiliate faculty for SMTC is comprised of faculty members from the College of Education,

the College of Arts and Sciences, the College of Agriculture and Natural Resources, and the College of Engineering and Applied Science.

The SMTC provides extensive off-campus professional development that serves Wyoming communities, administrators, teachers, students and school districts. SMTC in-service and extension courses, workshops, institutes and conferences are provided with the principal purpose of improving science and mathematics teaching in Wyoming.

NED is designed for students pursuing careers as environmental and natural science educators in non-public school settings, though there is a certification option for students in the program. A Ph.D. in Science Education or Mathematics Education is available through the College of Education.

The SMTC offers two graduate degree program options: the Master of Science of Natural Science in Middle Level Math (MMA) or Middle Level Science (MSC), designed for elementary, middle, and general science and mathematics teachers; and the Master of Science in Natural Science (NED), designed for students that are completing the first year of their graduate program at Teton Science School.

## Program Specific Admission

### Requirements

#### Master of Science in Natural Science - Middle Level Math/Middle Level Science/Natural Science Education

In addition to the minimum requirements set forth by the University of Wyoming, the Science and Mathematics Teaching Center also requires:

- Acceptance to the University of Wyoming

- The student has a valid teaching certification with two years of teaching experience (this requirement is waived for Natural Science Education students);

- The student has a composite score of 300 on the verbal and quantitative sections of the GRE general test or a score of 15 out of 20 on the SMTC GRE Alternative Portfolio; SMTC Writing Sample; Resume and 3 letters of recommendation

- Natural Science Education students only - acceptance in the Teton Science School Residency Program.

## Program Specific Graduate Assistantships

The SMTC has a number of graduate assistantships awarded on a competitive basis, as well as grant-funded graduate assistantships.

## Program Specific Degree

### Requirements

#### Master of Science in Natural Science, Middle Level Math/Middle Level Science

##### Plan B (non-thesis)

The university requirement for Plan B is 30 hours of coursework. The program requires at least 24 hours in mathematical sciences, biological sciences, or physical sciences. Of these, 15 hours must be natural sciences courses and 9 credit hours must be from appropriate science and mathematics courses in other departments.

The M.S. in Natural Science is intended for individuals teaching at the elementary or middle school level in science or mathematics.

The environment and natural resources graduate major or minor is an option for this program.

#### Master of Science in Natural Science, Natural Science Education

##### Plan B (non-thesis)

The university requirement for Plan B is 30 hours of coursework. This degree is limited to students accepted into the Teton Science School Professional Residency Program. The first year of study is at the Teton Science School site and the second year is at the University of Wyoming campus. 15 designated credit hours will be completed through the Teton Science School Professional Residency Program. For the remaining 15 credit hours (minimum) on the UW campus, students will work with a three-member faculty committee to design a balanced program of study in selected science content, science pedagogy, and related coursework.

The Environment and Natural Resources graduate major and minor is an option for this program.

The M.S. in Natural Science, Natural Science Education is intended for individuals pursuing careers as environmental and natural science educators in non-public school settings.

## Natural Science (NASC)

**1001. Quantitative Reasoning. 1.** Focuses on quantitative reasoning defined broadly as viewing the world through a mathematical perspective. Must apply to FIG.

**4790. Topics in Natural Science. 1-6 (Max. 10).** Presents selected science topics to acquaint teachers or prospective teachers with new concepts, materials or techniques, as introduced in various new school curricula. Topics may include earth science for the middle school, computer learning and/or elementary school environmental science. Includes laboratory.

*Prerequisite:* junior standing.

**4800. Field Studies in Natural Science. 1-6 (Max. 10).** Explores topics best studied in the field, on location, or otherwise outside the traditional classroom. Topics may include grassland ecosystem, geology field trips for elementary children and/or schoolyard study areas. Includes laboratory. *Prerequisite:* junior standing.

**5110. Physical Science in Global Context, MSC. 3.** One in a series of three courses investigating earth as a system. Examines the global dynamics of energy, hydrocarbon combustion, and the physics and chemistry of water. Investigates relationships between energy transformations and pollutants. Considers environmental limitations of fresh water availability and the buffering effect of sea and fresh water. *Prerequisite:* graduate standing and teaching certification in elementary, middle school or general science; or, graduate standing and concurrent enrollment in a program leading to teacher certification in Elementary, middle school or general science education.

**5120. Earth Science in Global Context, MSC. 3.** One in a series of three courses investigating earth as a system. Emphasizes the lithosphere and atmosphere and their interactions with the hydrosphere and biosphere. Examines the interplay between tectonic processes, earth's radiation balance, ocean processes, ozone depletion and the green house effect. Includes evaluation of methods of measuring and monitoring these phenomena. *Prerequisite:* graduate standing and teaching certification in elementary, middle school or general science; or, graduate standing and concurrent enrollment in a program leading to teach certification in elementary, middle school or general science education.

**5130. Life Science in Global Context, MSC. 3.** One in a series of three courses investigating earth as a system. Investigates ecosystem composition and processes, and biological responses to changes in ecosystem parameters. Examines terrestrial and aquatic

communities, photosynthesis, energy flow, biogeochemical cycles, global climate change, climate warning, deforestation, population ecology, DNA/RNA structure, function, genetic engineering and forensic applications. *Prerequisite:* graduate standing and teaching certification in elementary, middle school or general science education.

**5140. Numbers, Operations, and Patterns for the Middle-Level Learner, MMA. 3.** Provides working middle-level mathematics teachers opportunities to understand and discuss numbers, their representations, and operations on them, from an abstract perspective that includes elegant proof. Also emphasized is the role of language and purpose in composing definitions. Cross listed with MATH 5140. *Prerequisites:* admission to a UW graduate program, either degree or non-degree seeking status, and acceptance into the Middle-level mathematics program.

**5160. Social and Historical Issues in Mathematics and the Middle-Level Learner, MMA. 3.** Empowers teachers of middle-level mathematics to design more engaging experiences. Emphasizes the historical context for the development of mathematics, especially its symbols, tools, personalities, and classic problems. Cross listed with MATH 5160. *Prerequisites:* admission to a UW graduate program, in either degree or non-degree seeking status, and acceptance into the Middle-level Mathematics program.

**5170. Connecting Geometry with Problem-Solving for the Middle-Level Learner, MMA. 3.** Showcases two aspects of 2D and 3D geometry: measurement and transformation. Emphasis reflects current State and National standards for middle-level mathematics classroom and teacher preparation, especially appropriate uses of technology, geometric tools, mathematical language, and problem-solving strategies. Cross listed with MATH 5170. *Prerequisites:* admission to a UW graduate program, in either degree or non-degree seeking status, acceptance into the Middle-level mathematics program.

**5185. Analysis of Data in the Media for the Middle-Level Learner, MMA. 3.** Focuses on data collection, analysis, interpretation, and communication, using contexts relevant to everyday situations. Topics chosen integrate well with the concerns of middle-level teachers and connect with such curriculum areas as health, science, and social studies. This is not a research methods course. Cross listed with MATH 5185. *Prerequisites:* admission to a UW graduate program, in either degree or non-degree seeking status, and acceptance into the Middle-level Mathematics program.

**5190. Mathematics of Change and the Middle-Level Learner, MMA. 3.** Students gain a solid understanding of data and functions in the service of calculus. Hands-on, project-driven, and focuses on the essential concepts of functions and calculus and their role in middle-level mathematics. Emphasis is on writing and technology (calculators and probeware). Cross listed with MATH 5190. *Prerequisites:* admission to a UW graduate program, in either degree or non-degree seeking status, and acceptance into the Middle-level Mathematics program.

**5205. Methods of Teaching Middle-Level Mathematics, MMA. 3.** Research-based pedagogy and pedagogical content knowledge for teaching middle-level mathematics. Designed for practicing teachers of middle-grades mathematics. Cross listed with EDCI 5205. *Prerequisite:* admission to the SMTC Program.

**5215. Using Instructional Technology for Middle-Level Mathematics, MMA. 3.** Covers the use of technology appropriate to middle-level mathematics teaching, such as microworlds, geographic information systems, spreadsheets, and other content appropriate technologies. Cross Listed with EDCI 5215. *Prerequisite:* admission to the SMTC Program.

**5225. Assessment for Middle-Level Mathematics, MMA. 3.** Middle-level Mathematics Initiative teacher participants examine, analyze, and implement a variety of assessments that are aligned with standards and instruction appropriate to the middle level math learner. Cross listed with EDCI 5225. *Prerequisite:* admission to the SMTC Program.

**5300. Classroom Assessment in Middle-level Science, MSC. 2.** Deals with the design, construction, and testing of curriculum materials to bring the spirit of scientific inquiry to elementary school pupils. Research to be conducted in the Science and Mathematics Teaching Center.

**5320. Plan B Research in Science/Mathematics Classroom, MSC. 3.** A course to give graduate students in education, or in service teacher, an in-depth view of the new materials for teaching science in elementary schools. *Prerequisite:* consent of instructor.

**5400. Spatial Data Instructional Technology. 1.** Teaching strategies appropriate for elementary/middle school students' conceptual level of development. Positive attitudes toward teaching children about the Earth, its physical environment and human/environment relationships will be promoted. The course content will be supported by the use of geospatial technologies, such as GPS and GIS. *Prerequisite:* graduate standing.

**5510. Integrated Instructional Strategies, MSC. 2.** Appropriate instructional strategies are discussed and modeled for aligning standards, expectations, and experiences in an integrated science environment. Attention is given to unique characteristics of each strategy, including a review of research on the effectiveness of each strategy on student achievement and attitudes. *Prerequisite:* graduate standing and teaching certification in elementary, middle school or general science; or graduate standing and concurrent enrollment in a program leading to teacher certification in elementary, middle school or general science education.

**5600. Mathematics and Statistics in Science Teaching, MSC. 2.** Provides science teachers with the knowledge and experience necessary to help students use statistics in the scientific process. Activities emphasize a hands-on inductive approach closely related to the school science curriculum. Important statistical ideas and methods are studied as they arise naturally in the biological, physical, and earth sciences. *Prerequisite:* graduate standing and teaching certification in elementary, middle school or general science; or, graduate standing and concurrent enrollment in a program leading to teacher certification in elementary, middle school or general science education.

**5610. Field Studies in Environmental Education, NED. 4.** Expands student's knowledge of ecological and physiological animal and plant adaptations to environmental conditions, the use of teaching methods and tools of naturalists, the range of resources available for designing and evaluating curriculum, and promotes an appreciation and understanding of the diversity of environments. Contains 4 modules. *Prerequisite:* graduate standing; must be accepted into the Teton Science School Program and matriculating at the TSS site.

**5620. Advanced Elements of Field Ecology Course Design, NED. 5 (Max. 6).** Addresses designing field ecology courses that include research, outdoor leadership, and natural history components. Opportunities are provided to gain deeper understanding of key natural history and ecology concepts of the bioregion; practical strategies for teaching these concepts in field programs; and to formally present student work. *Prerequisite:* graduate standing; must be accepted into the Teton Science School Program and matriculating at the TSS site.

**5625. Place-Based Education - Teton Science School. 3.** Introduces graduate students at Teton Science Schools to the theory and practice of place-based education. The design of the course exposes students to the historical, political, and eco-social underpinnings of

place-based education while supporting students in developing thoughtful place-based pedagogies. *Prerequisite:* graduate student status.

**5630. Teaching Practicum-Teton Science School. 2-4 (Max. 6).** To improve teaching methods and techniques and expand professional skills. Integrates the foundation of Teton Science Schools, applies coursework content understanding and develops leadership. The course is intended to challenge previously held instructional beliefs and nurture an evolving set of skills and instructional identity. Not equivalent to EDSE 4500 or EDCI 5990 or EDEL 4500. *Prerequisite:* current enrollment at Teton Science School.

**5640. Introduction to Field Science Teaching. 3.** Designed to introduce graduate students at Teton Science Schools' to the field of environmental education and instructional concepts for teaching environmental science in the outdoors. Learn field science content, principals of connecting to place, teaching techniques, and learning theories related to environmental education and field science teaching. *Prerequisite:* current enrollment at Teton Science School.

**5650. Place-Based Learning. 3.** Place-based learning is explored and related to cognitive development, assessment, and education for a democracy. The focus is on science and mathematics and how to use "place" to provide meaningful learning experiences for students while making contributions to the community. Students develop a local place-based project.

**5700. Seminar in Science for Secondary School Teachers. 1-6 (Max. 6).** A course to give graduate students in education, or in-service teachers, an in-depth view of the new materials for teaching science in secondary schools. *Prerequisite:* consent of instructor.

**5770. Investigation in Natural Science for Secondary Teachers. 1-5 (Max. 10).** Deals with the design, construction, and testing of curricula materials to bring the spirit of scientific inquiry to secondary school students. Research to be conducted in the Science and Mathematics Teaching Center. *Prerequisite:* consent of instructor.

**5890. Directed Professional Study. 1 (Max. 6).** Primarily for upper-division students who can benefit from independent study with minimal supervision. Given to allow interested students to pursue specific aspects of curriculum and instruction. *Prerequisites:* consent of instructor and graduate standing.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes. S/U only. *Prerequisite:* graduate standing.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5961. Plan B Project. 1-4 (Max. 4).** Limited to those students enrolled in a Plan B graduate program. Students should be involved in non-course scholarly activities in support of their Plan B project. *Prerequisites:* must be enrolled in Plan B program and have departmental approval.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

# College of Engineering and Applied Science

2085 Engineering Building

Michael Pishko, Dean  
Phone: (307)766-4253 FAX: (307)766-4444  
Web site: ceas.uwyo.edu

Engineering is a profession that truly makes a difference. Engineers constantly discover how to improve lives by creating new solutions to real world problems and needs. From small villages to large cities, engineers are involved in innovative improvements to all aspects of life from health care, to energy production, to protecting and rehabilitating the environment, to developing the newest technological device. The broad background of communication, mathematical, scientific, and problem solving skills provided at the University of Wyoming will prepare engineering graduates to pursue careers in engineering, construction, environmental policy, even medicine or law. The possibilities are endless! The creativity and innovative thinking developed in engineering enables students to lead rewarding lives, work with inspiring people, and give back to their communities.

Computer science is a profession that is closely affiliated with engineering. At the University of Wyoming, degrees in computer science are awarded through the College of Engineering and Applied Science. The technology trends in this industry are also advancing at a tremendous rate. This requires that computer science education be at the forefront of new computing technologies, software languages, and networking.

## Mission

The University of Wyoming's College of Engineering and Applied Science will provide excellent education, research, and service in chosen fields of engineering and applied science. The College emphasizes connectivity with society, life-long learning, and the essential problem-solving and collaborative skills needed to address the frontier challenges facing Wyoming, the nation and the world.

## Design Experiences

In direct support of the goals of the individual departments within the College of Engineering and Applied Science, the design process is consistently developed and integrated throughout the curriculum from the freshman year through the senior year. Within the engineering science program, design elements such as basic analysis skills, communication skills, experimental skills, computational skills,

problem solving skills, and design methodology are taught. At the departmental level, these skills are developed further and the concepts of design methodology are reinforced. The design process culminates in a comprehensive design experience within the student's major.

## Accreditation

The following undergraduate programs are accredited by the Engineering Accreditation Commission of ABET: architectural engineering, chemical engineering, civil engineering, computer engineering, electrical engineering, energy systems engineering, mechanical engineering, and petroleum engineering.

Various options within different engineering programs are accredited as part of the primary major. That is, the electrical engineering/bioengineering option is accredited as an electrical engineering degree, and the chemical engineering/petroleum option is accredited as a chemical engineering degree.

The Bachelor of Science in Computer Science is accredited by the Computer Accreditation Commission of ABET.

## Programs of Study Undergraduate Degrees

*Bachelor of Science in Architectural Engineering*

*Bachelor of Science in Chemical Engineering*  
*Bachelor of Science in Chemical Engineering*  
(petroleum engineering option)

*Bachelor of Science in Civil Engineering*  
*Bachelor of Science in Computer Engineering*  
*Bachelor of Science in Computer Science*  
*Bachelor of Science in Computer Science*  
(business option)

*Bachelor of Science in Electrical Engineering*  
*Bachelor of Science in Electrical Engineering*  
(Francis M. Long bioengineering option)

*Bachelor of Science in Energy Systems Engineering*

*Bachelor of Science in Mechanical Engineering*  
*Bachelor of Science in Petroleum Engineering*

## Graduate Degrees

*Master of Science*

Architectural engineering  
Atmospheric science  
Chemical engineering

Civil engineering  
Civil engineering/water resources  
Computer science  
Computer science professional  
Electrical engineering  
Environmental engineering  
Mechanical engineering  
Petroleum engineering

## *Doctor of Philosophy*

Atmospheric science  
Chemical engineering  
Civil engineering  
Computer science  
Electrical engineering  
Mechanical engineering  
Petroleum engineering

Candidates for the various master's degrees in engineering are required to do a full year's work in residence either under Plan A or Plan B.

Students should understand that a strong background in mathematics is necessary to actively pursue an engineering curriculum. Credit toward an engineering degree is not allowed for algebra and trigonometry.

Coursework in all four-year curricula stresses the mastery of subjects fundamental to all fields of engineering. The balance of the program is divided between cultural context and courses applying to the particular field selected. The aim is to provide the student with such groundwork that the general principles acquired may be used successfully in any one of the several specialized fields he or she may follow after graduation.

Depending on the major, a minimum of 125 to 132 semester hours of credit is required for the bachelor's degree from the College of Engineering and Applied Science. All course work must be selected with prior approval. Detailed outlines of curricula are presented later under headings of the various departments of the college. Since most engineering programs are similar during the first year, students may change an engineering major during this time with little or no loss in credit.



The electives in cultural context must be selected such that the student meets all university studies requirements not covered by specific courses in the detailed curriculum outlines.

Degree candidates must meet the academic requirements of the university and must have a grade point average of 2.0 (C) or above in all engineering courses attempted at this university.

Students may not take a course for S/U credit to satisfy any requirement for a degree from the College of Engineering and Applied Science, unless the course is offered for S/U credit only.

All undergraduate engineering programs within the College of Engineering and Applied Science use the Fundamentals of Engineering Exam as one of their methods of outcomes assessment. As a graduation requirement, students must complete the exam, with a good faith effort, within one year prior to their expected graduation.

Preparation for the profession of engineering requires diligent work in the various curricula. The required credit hours can be completed in a four-year program, but because of the rigorous nature of some of the courses involved, some students may require additional time to complete degree requirements.

All engineering curricula are subject to minor program changes. The published curricula are general guides. Prospective students should consult the individual departments for current information.

## Graduate Study

The College of Engineering and Applied Science offers coursework and research opportunities leading to the following master's degrees: master of science in atmospheric science, chemical engineering, civil engineering, computer science, electrical engineering, environmental engineering, mechanical engineering, and petroleum engineering. Candidates for the various master's degrees in engineering are required to do a full year's study in residence either under Plan A or Plan B.

Only graduates with satisfactory GPAs in programs accredited by ABET are granted full admission to graduate study. In addition, graduates with satisfactory GPAs in undergraduate disciplines of meteorology, physics, mathematics, or related fields can be granted

full admission to graduate studies in atmospheric science. Other engineering graduates can be admitted on a provisional basis.

The College of Engineering and Applied Science offers coursework and research opportunities leading to the following doctoral degrees: doctorate in atmospheric science, chemical engineering, civil engineering, computer science, electrical engineering, mechanical engineering, and petroleum engineering. Interdisciplinary programs of study and research leading to one of the above disciplinary degrees can be developed.

## Engineering Science

**Program Director: Steven F. Barrett, Ph.D., P.E.**  
**2076 Engineering Building, 766-6181**  
**FAX: (307) 766-4444**

Engineering Science offerings present the fundamental engineering concepts upon which most engineering analysis and design work is based. Faculty are drawn from all of the academic departments in the college. These core courses represent the majority of engineering offerings at the freshman and sophomore level.

Courses in engineering science have their roots in mathematics and physical science, extending knowledge toward creative application. Thus, students must take their courses in calculus, chemistry, physics, and engineering science in a timely manner. Details are given in the published curriculum for each program. **A grade of C or better must be earned in all courses that are prerequisite to any required engineering science course.**

## Engineering Science (ES)

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀Q]).**

**1000. Orientation to Engineering Study. 1. [I,L▶(none)]** Skills and professional development related to engineering. Involves problem solving, critical thinking and ethics, as well as activities to help transition to university environment. Required of all freshmen entering engineering curricula. Students with credit in UNST 1000 may not receive credit for this course. (Normally offered both semesters)

**1002. Introduction to Engineering Information Literacy. 0.5. [L▶(none)]** Offers transfer students the opportunity to satisfy the College of Engineering and Applied Science requirements for the Information Literacy and the initial O component of the University Studies Program.

**1060. Introduction to Engineering Problem Solving. 3.** An overview of the methodology and tools used in the engineering profession for analyzing problems. Example problems are solved using spreadsheet tools and structured programming language. Laboratory. *Prerequisite:* MATH 2200 or concurrent enrollment.

**1061. Engineering Problem Solving with Spreadsheets. 1.** An introduction to engineering problem solving through the use of computer spreadsheets. Topics include functions, referencing, conditional statements, graphs, trendlines, and iterative solvers. *Prerequisite:* MATH 1400 or MATH 1450 or ACT Math Score of 25 or Math Placement Exam score of 4.

**1062. Introduction to Structured Programming. 1.** Introduction to structured programming through the use of computer applications. Topics include built-in functions, user functions, logical operators, flowcharts, pseudo code, selection structures, repetition structures, and plotting. *Prerequisite:* ES 1061.

**1063. Graphical Communication and Solid Modeling. 1.** An introduction to solid models and graphical communication. Topics include geometric relationships, solid parts, solid assemblies, constraints, orthogonal projection, multiview representation, dimensioning, and drawing annotation. *Prerequisite:* MATH 1400 or MATH 1450 or ACT Math Score of 25 or Math Placement Exam score of 4.

**1101. First-Year Seminar. 3. [(none)▶FYS]**  
**2110. Statics. 3.** Vector statics of particles and rigid bodies, including equilibrium in two and three dimensions, center of gravity, centroids, distributed loads, truss analysis, simple structures and machines, friction, and internal actions. *Prerequisites:* MATH 2205 or concurrent enrollment. (Offered fall, spring and summer)

**2120. Dynamics. 3.** Vector dynamics of particles and rigid bodies, including impulse-momentum and work-energy. *Prerequisites:* ES 2110 and MATH 2205; PHYS 1210 or concurrent enrollment. (Offered fall, spring and summer)

**2210. Electric Circuit Analysis. 3.** Basic concepts of electric circuit theory, dependent sources, network theorems, first and second order circuits, phasors, three-phase circuits. Laboratory. *Prerequisite:* MATH 2205. (Offered fall, spring and summer)

**2215. Electric Circuit Analysis Lecture. 2.** Basic concepts of electric circuit theory, dependent sources, network theorems, first and second order circuits, phasors, three-phase circuits. No laboratory. Available for Outreach students only. *Prerequisite:* MATH 2205.

- 2216. Electric Circuit Analysis Laboratory.**  
1. Laboratory activities focusing on basic concepts of electric circuit theory, dependent sources, network theorems, first and second order circuits, phasers, three-phase circuits. *Prerequisite:* ES 2215.
- 2310. Thermodynamics I. 3.** Macroscopic systems involving energy and its various forms. Fundamental concepts including energy, mass and entropy balances. Pure substances and availability. Reversible and irreversible processes. *Prerequisites:* (ES 2120 or PHYS 1210), MATH 2210. (Offered fall and spring)
- 2330. Fluid Dynamics. 3.** Incompressible flow of ideal and real fluids. Potential and stream functions; similitude and dimensional analysis. *Prerequisite:* (ES 2120 or PHYS 1210), MATH 2210. (Offered fall, spring and summer)
- 2410. Mechanics of Materials. 3.** Mechanics of deformable bodies, including energy methods. *Prerequisite:* ES 2110 and MATH 2205. (Offered fall and spring)
- 4910. Survey of Engineering Management. 3.** Offers a survey of a variety of topics related to engineering management. The objective is to introduce students to some of the non-technical aspects of engineering practice and management. *Prerequisite:* junior standing in an engineering degree program.
- 4965. EPSCoR Research. 1.** Seminar for undergraduates selected for EPSCoR research. Topics include graduate school, entrepreneurship, presentations. *Prerequisite:* selection for EPSCoR research.
- 4970. Engineering CO-OP. 1 (Max. 6).** Provides a mechanism for students on engineering co-op to maintain continuous registration and have the co-op experience reflected on their transcript. Credit earned will not normally count toward graduation credit. Offered S/U only. *Prerequisite:* must be involved in an engineering co-op experience.

## Department of Atmospheric Science

6034 Engineering Building, 766-3245

FAX: (307)766-2635

Web site: [www.atmos.uwo.edu](http://www.atmos.uwo.edu)

Department Head: Thomas R. Parish

### Professors:

**BART GEERTS**, Licentiaat Physical Geography Katholieke University, Belgium 1984; Engineer in Irrigation Sciences 1986; Ph.D. University of Washington 1992; Professor of Atmospheric Science 2011, 1999.

**ROBERT D. KELLY**, B.A. University of Wyoming 1973; M.S. 1978; Ph.D. University of Chicago 1982; Professor of Atmospheric Science 1990, 1984.

**XIAOHONG LIU**, B.S. Nanjing University 1986; M.S. 1989; Ph.D. 1992; Professor of Atmospheric Science 2013.

**THOMAS R. PARISH**, B.S. University of Wisconsin 1975; M.S. 1977; Ph.D. 1980; Professor of Atmospheric Science 1990, 1980.

**ALFRED R. RODI**, B.S. University of Chicago 1967; M.S. 1969; Ph.D. University of Wyoming 1981; Professor of Atmospheric Science 1993, 1981.

**JEFFERSON R. SNIDER**, B.S. University of Oregon 1979; M.S. University of Arizona 1982; Ph.D. University of Wyoming 1989; Professor of Atmospheric Science 2004, 1990.

**ZHIEN WANG**, B.S. Anhui Normal University (China) 1990; M.S. Chinese Academy of Sciences 1994; Ph.D. University of Utah 2000; Professor of Atmospheric Science 2015, 2004.

### Assistant Professors:

**JEFFREY R. FRENCH**, B.S. South Dakota School of Mines 1992; M.S. 1994; Ph.D. University of Wyoming 1998; Assistant Professor of Atmospheric Science 2015.

**ZACHARY J. LEBO**, B.S. Pennsylvania State University 2007; M.S. 2009; Ph.D. California Institute of Technology 2012; Assistant Professor of Atmospheric Science 2015.

**SHANE MURPHY**, B.S. University of Colorado 2000; Ph.D. California Institute of Technology 2009; Assistant Professor of Atmospheric Science 2011.

### Professors Emeritus:

Terry L. Deshler, John D. Marwitz, Derek C. Montague, Gabor Vali

Atmospheric Science is a rapidly developing discipline in which meteorology, physics, chemistry, biology, engineering, mathematics and computer science are all being applied in an effort to better understand the earth's atmosphere. The entire development of atmospheric science demonstrates how progress can result from the application of knowledge developed in the basic sciences to a complex environmental system. Concurrently, atmospheric scientists develop many observational and analytical techniques unique to the study of the atmosphere. Over the past decades, atmospheric science developed vigorously, stimulated by the availability of the latest satellite, ground-based and aircraft observations, as well as the availability of large computers for numerical simulations of atmospheric processes. At the same time, the importance of the atmosphere as a crucial resource in the

welfare and survival of humankind is being recognized, as knowledge about how the atmosphere behaves is obtained.

The Department of Atmospheric Science offers graduate programs leading to the M.S. and Ph.D. degrees.

In these graduate programs, great emphasis is placed on the active research involvement of students both during the academic year and during the summer months. The low student to faculty ratio in the department ensures an atmosphere of vital cooperation among students, faculty and staff. Student theses form integral parts of the department's research productivity and almost always lead to publishable results.

Research interests in the department center around cloud and precipitation physics, cloud and mesoscale atmospheric dynamics, boundary layer processes, tropospheric and stratospheric aerosols and chemistry, ozone depletion, wind energy, global change, instrumentation and air quality. These interests are also reflected in the department's academic program, which has the breadth and depth necessary to give students a background for entering into many different types of employment upon graduation.

A number of unique research tools are available in the department. Prominent among these is the King Air research aircraft which carries extensive instrumentation and computer-directed data acquisition systems. The department maintains a well-equipped observatory at the peak of 11,000 foot Elk Mountain. The tropospheric and stratospheric balloon launch facility is used to sample aerosols, volcanic plumes, clouds and ozone in Laramie, and in both the north and south polar regions. Excellent laboratory facilities are available in the department's spacious quarters. These laboratories focus on aerosol and nucleation research, on atmospheric optics, remote sensing, and atmospheric chemistry. Well-equipped electronic and mechanical construction and design facilities are conducive for work in instrumentation development. A wide range of computer facilities are available, providing excellent support both in hardware and software for research activities and for learning.

A prerequisite for admission to the graduate program is a bachelor's degree in meteorology, engineering, physics, chemistry, mathematics or a similar relevant discipline. Graduate assistantships are available by application to the department and are awarded on the basis of past record and promise for achievement.

For material containing further details on curriculum and research programs, write to the graduate admissions coordinator or visit the web site at [www.uwyo.edu/atsc/](http://www.uwyo.edu/atsc/).

## Graduate Study

The Department of Atmospheric Science offers degree programs leading to the master of science (Plan A only) and doctor of philosophy degrees.

The department has strong research programs in the following areas: cloud physics and dynamics; tropospheric aerosols and clouds; stratospheric aerosol and ozone; boundary layer processes; remote sensing; and airborne- and balloon-borne instrumentation. The department's observational facilities are: 1) the King Air research aircraft (UWKA); 2) the Wyoming Balloon Launch Facility; 3) the Elk Mountain Observatory at 11,000 ft altitude; 4) the Wyoming Cloud Radar (WCR) and Wyoming Cloud Lidar (WCL) for the study of cloud structure and composition; and 5) the Keck Aerosol Laboratory. The UWKA, WCR, and WCL are designated Lower Atmospheric Observing Facilities by the National Science Foundation (NSF).

Please refer to the departmental homepage at [www.atmos.uwyo.edu](http://www.atmos.uwyo.edu) for programmatic updates, or contact the department directly.

## Program Specific Admission Requirements

Admission based on the university minimum requirements. Admissions are competitive.

## Program Specific Graduate Assistantships

Assistantships are offered for both the M.S. and Ph.D. tracks.

## Program Specific Degree Requirements

### Master's Program

Approval of research plan by the graduate committee (at the end of year one)

Colloquium and oral defense of M.S. thesis

Approval of M.S. thesis by the graduate committee

Requires a minimum of 26 hours of acceptable graduate coursework and four hours of thesis research and a thesis (final written project).

21 in-residence coursework hours

### Doctoral Program

Qualifying assessment exam

Approval of research plan by the graduate committee

At least one colloquium presentation per year

Preliminary exam (at least 15 weeks before dissertation defense)

Oral defense of Ph.D. dissertation

Approval of Ph.D. dissertation by the graduate committee

Ph.D. requires a minimum of 72 graduate hours, but at least 42 hours must be earned in formal coursework.

42 hours of formal graduate coursework including appropriate coursework from a master's degree.

Additional credits toward the 72 credit hour requirement may include dissertation research hours, internship hours, or additional coursework.

24 in-residence coursework hours

## Required Courses

These courses are required for both master's and doctoral programs.

ATSC 5008. Mesoscale Meteorology. 2.

ATSC 5010: Physical Meteorology. 4.

ATSC 5011: Physical Meteorology II. 4.

ATSC 5014: Dynamic Meteorology. 4.

ATSC 5016: Synoptic and Mesoscale Meteorology. 4.

ATSC 5018. Ethics and Research Methods. 1.

ATSC 5210. Cloud and Precipitation Systems. 3.

ATSC 5880: ATSC Problems. 1.

UW Elective(s) to be determined by committee. 3 minimum

ATSC Elective(s). To be determined by committee. 3 minimum

## Atmospheric Science (ATSC)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

**2000. Introduction to Meteorology. 4. [SE♦♦PN]** First course in meteorology for students with minimal background in math and science. Provides general and practical understanding of weather phenomena. Emphasizes observational aspects of the science, meteorological view of the physical world and the impact the science has on life and society. Includes three hours of lecture and one laboratory per week. Includes atmospheric composition and structure, radiation, winds and horizontal forces, stability and vertical

motions, general circulation, synoptic meteorology, clouds and precipitation, severe storms and atmospheric optics.

**2100. Atmospheric Change: Composition and Climate. 3.** Introduces non-specialists to a broad overview of global, regional and local atmospheric impacts of mankind's activities and natural phenomena, and their consequences. Includes global warming and potential for climate change, atmospheric ozone depletion, acid rain, urban air pollution and problem alleviating mitigating strategies.

**3032. Weather Analysis and Forecasting. 3.** Students learn to access, display, and interpret meteorological data including surface, upper air, satellite, and radar data, and become familiar with NWP models and weather predictability. They gain a basic understanding of dynamic and physical meteorology through real-time applications, and are introduced to meteorological data display software applications. *Prerequisites:* MATH 2205 and PHYS 1310 or equivalent.

**4001. Modeling the Earth System. 4.** Takes a modeling approach to demonstrate how the Earth is integrated into an interconnected system through exchanges of energy and matter, and how Earth system functioning is susceptible to human alteration. Unifying concepts focus on quantitative interactions between the Earth and the Sun, and between the Earth's lithosphere, hydrosphere, biosphere and atmosphere. Cross listed with BOT/ESS/GEOL. *Prerequisites:* MATH 2205 or equivalent and [ESS 2000 or GEOL 2000].

**4007. Problems in Synoptic Meteorology. 1.** Laboratory supplement to ATSC 5160. Analysis of weather systems using operational observations and numerical model output. Real-time weather briefings. Numerical simulation of select weather phenomena. Dual listed with ATSC 5007. *Prerequisites:* ATSC 4130, 5130; 4160, 5160 or concurrent enrollment and permission of instructor.

**4008. Mesoscale Meteorology. 2.** Fundamental dynamics of mesoscale motions including departures from hydrostatic balance. Mesoscale energy sources. Boundary layer circulations. Convective initiation. Structure and dynamics of deep convection and mesoscale organized convection. Atmospheric waves. Orographically modified flow. Dual listed with ATSC 5008. *Prerequisites:* ATSC 4160, 4007, 5160, 5007 and permission of the instructor.

**4031. Atmospheric Dynamics. 3.** Atmospheric statics, development and interpretation of Newton's Second Law of Motion as applied to the atmosphere, scales of motion, atmospheric motion types, thermal wind equation, circulation and vorticity, boundary layer

motions, introduction to quasi-geostrophic theory. *Prerequisites:* MATH 2210, PHYS 1320, ATSC 4010.

**4033. Atmospheric Remote Sensing. 3.** Satellite ground-based remote sensing from UV to microwave including the principles of atmospheric radiative transfer, descriptions of important satellite orbits and sensors, the retrieval of atmospheric forecast and air quality monitor. *Prerequisites:* MATH 2210 or 2310, and PHYS 1310 & 1320 or equivalent.

**4035. Atmospheric Processes II. 3.** Starts with physical-meteorology concepts necessary for a first-time examination of cloud microphysics – aerosol physical properties, Mie and Rayleigh radiative transfer, moisture variables, conserved temperatures, saturation vapor pressure – finishes with water and ice nucleation, diffusional and collection hydrometeor growth, and radiative forcing by clouds. *Prerequisites:* ATSC 4010 and ATSC 4031.

**4160. Synoptic Meteorology. 2.** Structure and evolution of the extratropical cyclone, identification and development of fronts, jet streams and associated weather features; theories of cyclogenesis; role of topography. Climatology of formation and movement of a cyclone. Mesoscale circulation features; ingredients of severe weather. Dual listed with ATSC 5160. *Prerequisites:* ATSC 4031, 5001, 5003, 5100, 5004 5031 and permission of instructor.

**4320. The Ocean Environment. 3.** Focuses on the ocean as a system. Objective is the development of interdisciplinary understanding of marine processes, especially those processes occurring along coastal margins. Emphasis is on the development of quantitative models and their use in understanding anthropogenic impact on ocean resources. Dual listed with ATSC 5320. *Prerequisites:* MATH 2310, PHYS 1310, CHEM 1030, ES 3060 (or ES 3070), LIFE 1010, senior standing or higher.

**4400. The Physical Basis of Climate. 3.** Global atmospheric and oceanic circulations, radiation balance, water balance and hydrologic cycle, energy balance, energy and moisture transport, evaporation and evapotranspiration, energetic processes, and theories of climate change. *Prerequisites:* MATH 2200, PHYS 1310, and CHEM 1020.

**4410 [4330]. Introduction to Micrometeorology. 3.** Quantitative and descriptive study of processes effecting exchanges of energy, momentum, gases, and particles between the atmosphere and the bio/geosphere, including the effects of plant cover, land use changes, diurnal and seasonal cycles, turbulence, boundary layer structure, local weather, and

climate. Instrumentation and techniques also discussed. *Prerequisites:* ATSC 4010 and MICR 2021, LIFE 2022, or LIFE 2023.

**4650. Undergraduate Research in Atmospheric Science. 2-6 (max 9).** Course Description and *Prerequisites:* Independent research in atmospheric science under supervision of an atmospheric science faculty member. Projects are possible in the fields of cloud and aerosol physics, radar meteorology, mesoscale dynamics, and stratospheric chemistry. Participation in field work, involving the UW aviation or stratospheric ballooning facilities, is a possibility. Research results are summarized in a report. *Prerequisites:* ATSC 4000 and 4100, plus consent from advising faculty.

**4900. Problems in Atmospheric Science. 1-3 (Max. 10).** Independent study of a particular problem or phrase of atmospheric science, or presentation of reviews and discussion of current advances in atmospheric science investigations. *Prerequisites:* ATSC 4010, 4031, and 4035.

**5008. Mesoscale Meteorology. 2.** Fundamental dynamics of mesoscale motions including departures from hydrostatic balance. Mesoscale energy sources. Boundary layer circulations. Convective initiation. Structure and dynamics of deep convection and mesoscale organized convection. Atmospheric waves. Orographically modified flow. Dual listed with ATSC 4008. *Prerequisites:* ATSC 4160, 4007, 5160, 5007 and permission of the instructor.

**5010. Physical Meteorology. 4.** First and second law of thermodynamics applied to energy transformations in the atmosphere, including dry, moist, and saturated processes and atmospheric stability. Fundamentals of radiation including blackbody, planetary budget, and propagation and how these drive the thermodynamics of the earth's atmosphere. *Prerequisites:* MATH 2210, PHYS 1310 and PHYS 1320 or equivalent.

**5011. Physical Meteorology II. 4.** Quantitative description of cloud particle nucleation, growth by condensation, and growth by deposition and collection. Ties to other atmospheric processes, e.g., radiation budgets and cloud dynamics, are also emphasized. Course material is presented in lecture and computer-based laboratory settings. A numerical cloud model is developed and analyzed in the laboratory. *Prerequisite:* ATSC 5010.

**5014. Dynamic Meteorology. 4.** Development and interpretation of the atmospheric equations of motion, scales of motion, horizontal atmospheric winds, thermal wind equation, circulation and vorticity, mesoscale motions. Introduction to planetary boundary layer flows. Data visualization software is

also introduced and used to develop understanding of dynamical processes. *Prerequisites:* MATH 2210, PHYS 1310 and PHYS 1320 or equivalent.

**5016. Synoptic and Mesoscale Meteorology. 4.** Large-scale vertical motion as viewed from quasigeostrophic and isentropic potential vorticity perspectives. Baroclinic instability, and the structure and evolution of extratropical cyclones. Identification and development of fronts, jet streams and associated weather features. Symmetric instability and other mesoscale instabilities. Role of topography on large-scale and mesoscale circulations. *Prerequisites:* MATH 2210, PHYS 1310 and PHYS 1320 or equivalent.

**5018. Ethics and Research Methods. 1.** Ethics and ethical dilemmas in research and academia and how to address them are discussed. This course also covers general research methodology and describes processes for research funding and disseminating research findings and the peer-review process. *Prerequisite:* graduate standing.

**5040. Climate Science and Climate Change. 3.** Global climate system components, and their interactions. Radiative, dynamic, thermodynamic, chemical, and feedback processes affecting the climate system. Natural and anthropogenic drivers of climate change. Past and present climate variability and sensitivity, and its simulation. Structure of climate models, their components, parameterizations, and attributes. Current climate modeling results and predictions of future climate. *Prerequisites:* ATSC 5001, ATSC 5016.

**5210. Cloud and Precipitation Systems. 3.** Types of clouds and precipitation systems, and the precipitation mechanisms in those systems; structure of convective, orographic, and frontal systems and severe storms. Schematic and numerical models of clouds and storms with emphasis on hailstorms. *Prerequisite:* ATSC 5005 and 5100.

**5310. Atmospheric Dynamics II. 3.** Introduction to the dynamic energetics of the atmosphere, wave motions, atmospheric instabilities. Introduction to numerical modeling, applications. *Prerequisite:* ATSC 5015.

**5320. The Ocean Environment. 3.** Focuses on the ocean as a system. Objective is the development of interdisciplinary understanding of marine processes, especially those processes occurring along coastal margins. Emphasis is on the development of quantitative models and their use in understanding anthropogenic impact on ocean resources. Dual listed with ATSC 4320. *Prerequisite:* MATH 2310, PHYS 1310, CHEM 1030, ES 3060 (or ES 3070), LIFE 1010, senior standing or higher.

**5330. Boundary Layer Meteorology. 3.** A quantitative and descriptive study of the thermodynamics and dynamics of the planetary boundary layer, including budgets (heat, moisture, momentum, turbulent kinetic energy, radiation), stability, turbulence and turbulent fluxes, convection, terrain effects, phenomenology, and measurement and analysis techniques. *Prerequisite:* ATSC 5010, 5015.

**5340. Radar Meteorology. 3.** The theory of radar and the application of radars to studies of the atmosphere, including basic radar design, distributed targets, attenuation, polarization, Doppler velocities, analysis techniques, and examples of radar studies of clear air, clouds, and precipitation. *Prerequisite:* ATSC 5010, ATSC 5011.

**5350. Atmospheric Chemistry. 3.** Origin and composition of the atmosphere. Sources, lifetimes, transport of gases and aerosols. Cycles of C, S, N and trace elements. Removal processes: precipitation, and dry deposition. Homogenous and Heterogeneous kinetics. Anthropogenic influences: effect of air pollution on radiation balance and cloud processes. *Prerequisite:* graduate standing in a physical science or engineering.

**5370. Meteorological Instrumentation. 3.** Physical principles of instruments, their response characteristics and their proper use. Error analysis and interpretation of data. Classical instruments. Introduction to modern methods and instrumentation. Remote sensing, such as by radar and lidar. Instrument systems, such as on aircraft, and remote platforms, such as satellites and buoys. Laboratory experience with a large variety of instruments will be part of the course. *Prerequisite:* graduate standing in a physical science or engineering.

**5500. Atmospheric Radiation and Optics. 3.** Overview of atmospheric radiation, basic definitions, and basic laws of radiation. Nature of solar and terrestrial radiation, and atmospheric transmission. Derivation and analytic solutions to the equation of radiative transfer. Radiative transfer models at solar and terrestrial wavelengths, net radiation, and effects of polarization. Radiative properties of molecules, aerosols, and clouds (Rayleigh and Mie scattering). Inadvertent climate modification. Atmospheric refraction, diffraction and polarization phenomenon. *Prerequisite:* ATSC 5011.

**5600. Advanced Cloud Microphysics. 3.** Analysis of the processes involved in cloud and precipitation formation. Detailed treatments of the condensation, ice nucleation, vapor growth, and collection processes. Emphasis is on reviewing the current state of knowledge in the field and on surveying directions of research. *Prerequisite:* ATSC 5010 and ATSC 5011.

**5880. Atmospheric Science Problems. 1-3 (Max. 6).** A special course for graduate students in atmospheric science only, designed to make possible the study and investigation of problems or phases of atmospheric science selected to fit the needs of students.

**5890. Atmospheric Science Seminar. 1-3 (Max. 6).** A seminar-type class furnishing motivation for advanced study of current problems by means of library research, study of current literature, and carefully guided class discussions. *Prerequisite:* consent of department head.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12. (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrolled in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Graduate level course designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrolled in a graduate level degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Department of Chemical and Petroleum Engineering

4055 Engineering Building, 766-2500

FAX: (307) 766-6777

Web site: [www.eng.uwyo.edu/chemical](http://www.eng.uwyo.edu/chemical)

Interim Department Head: Hertanto Adidharma

### Professors:

**DAVID M. BAGLEY**, B.S. Colorado School of Mines 1984; M.S. Cornell University 1989; Ph.D. 1993; Professor and Department Head, Chemical and Petroleum Engineering 2011, 2005.

**KHALED A.M. GASEM**, B.Sc. University of California at Berkley 1976; M.Sc. Colorado School of Mines 1979; Ph.D. Oklahoma State University 1986; Professor of Chemical Engineering 2014.

**MICHAEL V. PISHKO**, B.S. University of Missouri-Columbia 1986; M.S. 1987; Ph.D. University of Texas at Austin 1992; Professor of Chemical Engineering 2015.

**MACIEJ RADOSZ**, M.S. Cracow University of Technology 1972; Ph.D. 1977; Professor of Chemical Engineering 2000.

**MRITYUNJAI P. SHARMA**, B.Sc. B.I.T.T. in Dhanbad, India 1967; M.Tech. I.I.T. in Kampur, India 1970; Ph.D. Washington State University 1977; Professor of Petroleum Engineering 1992, 1982.

### Associate Professors:

**HERTANTO ADIDHARMA**, B.Sc. Institute of Technology, Surabaya 1987; Ph.D. Louisiana State University 1999; Associate Professor of Chemical Engineering 2011, 2005.

**VLADIMIR ALVARADO**, B.Sc. Universidad Central de Venezuela 1987; M.S. Institut Francais du Pétrole 2002; Ph.D. University of Minnesota 1996; Associate Professor of Petroleum Engineering 2012, 2006.

**DAVID A. BELL**, B.S. University of Washington 1976; M.S. Rice University 1979; Ph.D. Colorado State University 1992; Associate Professor of Chemical Engineering 2000, 1993.

**MAOHONG FAN**, B.S. Wuhan University of Science and Engineering 1984; M.S. Beijing University of Science and Tech., 1992; Ph.D. Chinese Academy of Sciences 1997; Ph.D. Iowa State University 2000; Ph.D. Osaka University 2003; Associate Professor of Chemical Engineering 2008.

**LAMIA GOUAL**, B.Sc. Ecole Nationale Polytechnique 1993; M.Sc. Imperial College London 1998; Ph.D. 2003; Associate Professor of Chemical and Petroleum Engineering 2014, 2007.

**JOSEPH HOLLES**, B.S. Iowa State University 1990; M.E. University of Virginia 1998; Ph.D. 2000; Associate Professor of Chemical Engineering 2010.

**PATRICK JOHNSON**, B.S. Lehigh University 1992; M.S. University of Virginia 1994; Ph.D. Columbia University 2004; Associate Professor of Chemical Engineering 2012, 2006.

**MOHAMMAD PIRI**, B.Sc. Azad University, Arak 1995; M.Sc. Azad University, Tehran 1998; M.Sc. Imperial College, London 2000; Ph.D. 2004; Associate Professor of Petroleum Engineering 2011, 2005.

**SHUNDE YIN**, B.S. Shijiazhuang Railway University, China 1999; M.S. Chinese Academy of Sciences 2003; Ph.D. University of Waterloo 2008; Associate Professor of Petroleum Engineering 2014, 2008.

**Assistant Professors:**

**SAMAN ARYANA**, B.S. University of Texas at Arlington 2003; M.S. 2006; Ph.D. Stanford University 2012; Assistant Professor of Petroleum Engineering 2013.

**DONGMEI (KATIE) LI**, B.S. Shandong University of Technology 1994; M.S. Tianjin University 1997; M.S. University of Colorado at Boulder 1999; Ph.D. 2003; Assistant Professor of Chemical Engineering 2011.

**JOHN OAKEY**, B.S. The Pennsylvania State University 1997; M.S. Colorado School of Mines 1999; Ph.D. 2003; Assistant Professor of Chemical Engineering 2010.

**KAREN WAWROUSEK**, B.S. The College of St. Rose 2001; Ph.D. California Institute of Technology 2009; Assistant Professor of Chemical Engineering 2015.

**Assistant Lecturer:**

John Myers

**Adjunct Professors:**

John Ackerman  
 Morris Argyle  
 Jill Buckley  
 Geoffrey Mason  
 Youqing Shen  
 John Schabron  
 Koichi Takamura

**Professors Emeriti:**

Chang Yul Cha  
 Jack Evers  
 H. Gordon Harris  
 Henry W. Haynes  
 Norman R. Morrow

## Chemical Engineering

Chemical Engineering is one of the most versatile of the engineering programs. It prepares students for employment in many diverse fields, such as petroleum refining, production of pharmaceuticals, petrochemicals, polymers and plastics, semiconductors, heavy industrial chemicals, and synthetic fuels. Chemical engineers also work in metallurgy, corrosion control, enhanced oil recovery, environmental engineering and biological engineering. Undergraduate chemical engineering training has been found to be an excellent background for graduate work not only in engineering, but also in a number of other fields, including medicine, law, business, and the natural sciences.

The chemical engineering curriculum is based on a sound background in chemistry, mathematics, physics, and biology. The essentials of engineering are added to this foundation, including fluid dynamics and thermodynamics. In order to develop the individual's social consciousness and to broaden the student's educational background, an integrated program of study in the humanities and social sciences is included in the curriculum. Chemical engineering courses in multicomponent thermodynamics, transport phenomena, kinetics, process control and process design are concentrated in the junior and senior years. This program provides training for engineers to enter production, research, product and process development, process design, technical sales and engineering management positions. Training in chemical engineering equips the graduate to solve many of the problems facing society today: human health, energy shortages, synthetic fuels production, water and air pollution, toxic chemical control, and food production. Furthermore, our program prepares students interested in a career in medicine or the life sciences and is suitable for premed and pre-dental students.

The department offers a 18-credit-hour block of approved electives and encourages concentration in an area of interest. At least one of the elective courses must be CHE. Students can elect to concentrate in Biomaterials and Polymers, Biomedical Engineering, Biotechnology, Chemistry, Environmental Engineering, International Engineering, Math, and Petroleum Engineering for which elective courses are approved by the department. Finally, students can design their own self-directed 18-credit-hour block of electives to reflect individual interests.

Chemical Engineering degree candidates must meet the academic requirements of the college and, in addition, must have a GPA of 2.0 in Chemical Engineering courses attempted at UW that are applied toward graduation for the B.S. degree from the department.

### Chemical Engineering Program Educational Objectives

Three to six years after graduation, graduates who choose to practice in Chemical Engineering should:

- Successfully practice the profession of Chemical Engineering;
- Demonstrate successful career growth

## Chemical Engineering Program Outcomes

During the course of study in Chemical Engineering, the student should develop:

- an ability to apply knowledge of mathematics, science, and engineering;
- an ability to design and conduct experiments, as well as to analyze and interpret data;
- an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
- an ability to function on multidisciplinary teams;
- an ability to identify, formulate, and solve engineering problems;
- an understanding of professional and ethical responsibility;
- an ability to communicate effectively;
- the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
- a recognition of the need for, and ability to engage in life-long learning;
- a knowledge of contemporary issues;
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

## Chemical Engineering Curriculum

For students entering UW Fall 2015 or later

<b>FRESHMAN YEAR: Fall</b>		<b>Hrs.</b>
First-Year Seminar (FYS)	.....	3
MATH 2200 (Q)	.....	4
CHEM 1050 (PN)	.....	4
LIFE 1010	.....	4
<b>Total Hrs.</b>		<b>15</b>

<b>FRESHMAN YEAR: Spring</b>		<b>Hrs.</b>
MATH 2205	.....	4
CHEM 1060	.....	4
PHYS 1210*	.....	4
ENGL 1010 (COM1)	.....	3
CHE 1005	.....	1
<b>Total Hrs.</b>		<b>16</b>

<b>SOPHOMORE YEAR: Fall</b>		<b>Hrs.</b>
MATH 2210	.....	4
CHEM 2420	.....	4
CHE 2005	.....	3
PHYS 1220	.....	4
COJO 2010 (COM2)	.....	3
<b>Total Hrs.</b>		<b>18</b>

<b>SOPHOMORE YEAR: Spring</b>		<b>Hrs.</b>
MATH	2310.....	3
CHEM	2440.....	4
CHE	2060.....	3
CHE	2070.....	3
CHE	2080.....	3
<b>Total Hrs.</b>		<b>16</b>

<b>JUNIOR YEAR: Fall</b>		<b>Hrs.</b>
CHE	3015.....	3
CHE	3026.....	3
CHE	3028.....	3
CHEM	4507.....	3
Technical Elective**	.....	3
<b>Total Hrs.</b>		<b>15</b>

<b>JUNIOR YEAR: Spring</b>		<b>Hrs.</b>
CHE	3035.....	3
CHE	3070.....	3
CHE	4060.....	3
Human Culture (H)	.....	3
Technical Elective**	.....	3
<b>Total Hrs.</b>		<b>15</b>

<b>SENIOR YEAR: Fall</b>		<b>Hrs.</b>
CHE	3040.....	3
CHE	4070.....	4
CHE	4090.....	3
Human Culture (H)	.....	3
Technical Elective**	.....	3
<b>Total Hrs.</b>		<b>16</b>

<b>SENIOR YEAR: Spring</b>		<b>Hrs.</b>
CHE	4050.....	3
CHE	4080.....	4
U.S. & Wyoming Constitutions (V)	.....	3
Technical Elective**	.....	3
Technical Elective**	.....	3
<b>Total Hrs.</b>		<b>16</b>

\*The ES 2110/2120 sequence can be substituted for PHYS 1210.

\*\*Chemical Engineering Curriculum allows for the following Elective Concentrations: Petroleum Engineering, Biological Engineering, Environmental Engineering, Graduate School Preparation. Elective courses can also be used to obtain a concurrent Chemistry major (Plan 1 BS or BA) or a minor (Math, Business, Management, Agricultural Business, etc.), or to satisfy pre-med recommended courses. Students are referred to the respective departments for further information. The Chemical Engineering Program only requires that the number of credits of upper-division courses be satisfied (i.e., ten credits of electives must be 3000+).

### Areas of Concentration

**Biological Engineering:** MOLB 2021 General Microbiology (4), CHE 4100 Biochemical Engineering (3), CHE 4160 Biomedical Engineering (3) + approved electives.

**Biological Engineering Pre-medicine Sequence (satisfies pre-med requirements):** MOLB 2021 General Microbiology (4), MOLB

3610 (4); [Alternative: [MOLB 4600 (3) and MOLB 4610 (3)], LIFE 3050 Genetics (4), LIFE 3600 Cell Biology (3) + CHE 4160 Biomedical Engineering (3). Students should contact the Preprofessional Advising Office for pre-med and pre-dental advising.

**Concurrent Chemistry Major (Plan-1BS):** CHEM 2230 Quantitative Analysis (4) + CHEM 4000 Seminar (1) + CHEM 4110 Introduction to Inorganic Chemistry (3) + CHEM 4100 Inorganic Chemistry Lab (2) + CHEM 4508 Physical Chemistry II (3) + CHEM 4530 Physical Chemistry Lab (1) + CHEM 4930 Undergraduate Research (2) + 3 credits of upper-division Chemistry electives. Students should contact the Department of Chemistry for additional information.

**Environmental:** MOLB 2021 General Microbiology (4) + CE 3400 Introduction to Environmental Engineering (3) + CHE 4110 Air Pollution for Chemical Engineers (3) + CHE 4100 Biochemical Engineering (3) or approved elective.

**International:** 15 hours of foreign language and a semester abroad, which satisfies 9 hrs of Human Culture (H). Hence 15 - 9 = 6 hrs are available for electives.

**Math:** *Math Minor:* MATH 2250 Elementary Linear Algebra (3) + MATH 2800 Math Seminar (2) + MATH 3340 Introduction to Scientific Computing + two MATH 3000-plus electives (for example, Math 3310 and CHE 5140/MATH 5310).

**Petroleum Engineering:** PETE 2050 Introduction to Petroleum Engineering (3), PETE 3200 Reservoir Mechanics (3), PETE 4060 Flow through Porous Media (3), GEOL 4190 Petroleum Geology (3) or approved elective.

**Self-directed:** Individual Elective plan approved by adviser.

*Concentration definitions may change to reflect the most recent class offerings. Please consult with your adviser.*

## Graduate Study

The Department of Chemical and Petroleum Engineering offers graduate programs leading to the M.S. and Ph.D. degrees in chemical engineering and in petroleum engineering. The M.S. degree is offered under Plan A and Plan B. In addition, an environmental engineering program, run jointly by the Department of Chemical and Petroleum Engineering and the Department of Civil and Architectural Engineering, offers graduate programs leading to an M.S. in environmental engineering under either Plan A or Plan B.

## Program Specific Admission Requirements

### A. Admission Process and Requirements

#### Standard Admission

Admission is open to students with at least a bachelor's degree who meet the minimum requirements:

1. A GPA of 3.0 (A = 4), or equivalent;
2. A GRE score of 305 (combined verbal and quantitative sections)\*
3. For international applicants who did not attend an English-speaking program in an English-speaking country for all years of their highest degree:

A TOEFL score of 600 (paper-based), 250 (computer-based), or 80 (Internet based) or an IELTS score of 6.5.

Complete official transcripts of all prior college-level coursework and recommendations from three references must be submitted as parts of the application.

The deadline to submit application credentials is February 1 (to be considered for Fall semester), and October 1 (to be considered for Spring semester).

The application will not be processed until all the necessary documents have been submitted.

### B. Graduate Study Guidelines

All incoming Ph.D. and M.S. Plan A students who have not been assigned to an adviser are required to meet with all the faculty members (and obtain their signatures) in their program to get information regarding their research projects and evaluate the possibility of joining one of the research groups.

All incoming M.S. Plan B students must have an adviser. The student is responsible for contacting faculty members in order to find an adviser.

All Chemical Engineering graduate students must take the following Chemical Engineering Core courses:

1. Thermodynamics (CHE 5020)
2. Transport Phenomena (CHE 5010)
3. Reaction Kinetics (CHE 5030)
4. Mathematical Methods in Chemical Engineering (CHE 5355)

#### Credit Hours

Total (from above)	.....	12
A graduate level course in mathematics, statistics, or computing	.....	3
CHE/PETE 5960 Thesis Research	.....	4
Electives	.....	11
<b>Total</b>	.....	<b>30</b>

All Petroleum Engineering graduate students must take at least four out of the following Petroleum Engineering Core courses:

1. Mathematical Methods in Chemical Engineering (PETE 5355)
2. Thermodynamics (PETE 5020)
3. Transport Phenomenon (PETE 5010)
4. Fundamentals of Enhanced Oil Recovery (PETE 5310)
5. Flow Thru Porous Media (PETE 5060)
6. Reservoir Simulation (PETE 5300).

**Credit Hours**

Total (from above) .....	12
A graduate level course in mathematics, statistics, geology, or computing.....	3
CHE/PETE 5960 Thesis Research .....	4
Electives .....	11
Total .....	30

*Plan B (non-thesis)*

The coursework requirements are the same as the M.S. Plan A requirements except that Thesis Research (CHE, PETE 5960) is not required. Plan B students take an additional 4 hours of elective course credits (total of 30 hours required).

M.S. Plan B students must write a paper on a topic assigned by the adviser. This paper must be submitted to the student's graduate committee for approval.

*Doctoral Program*

**Credit Hours**

M.S. Plan A list (except CHE, PETE 5960); petitions allowed.....	26
Dissertation Research (CHE or PETE 5980).....	30
Electives (no internship 5990) .....	16
Total .....	72

*M.S. and Ph.D. Seminar Requirements*

All chemical and petroleum engineering graduate students must enroll in CHE/PETE 5890, Chemical and Petroleum Engineering Seminar, every semester. All seminars, including the required presentations described below, must be scheduled by the seminar coordinator. Registered off-campus graduate students can be exempt from having to enroll in CHE/PETE 5890.

*Ph.D. Preliminary Examination*

All Ph.D. students must pass a preliminary examination no later than the end of the student's fifth full semester in the graduate program and a least 15 weeks prior to the dissertation defense. Prior to attempting the

Ph.D. preliminary examination, students must have completed all required core classes no later than the end of their fourth semester in the graduate program. Students must file a program of study prior to attempting the preliminary examination.

The goal of the preliminary exam is for the student to demonstrate his or her research progress to-date and present the research proposition that will be investigated and lead to his or her final dissertation. The preliminary exam consists of three components: a written document provided to each member of the student's graduate committee at least one week prior to the oral presentation; a public oral presentation; and a private examination by the student's graduate committee immediately following the oral presentation.

The written document may be in any format but must concisely provide a survey of the relevant literature, a summary of the student's progress to-date, and a clear, detailed plan for the successful completion of the proposed work. The preliminary exam oral presentation should be consistent with the written document. It should provide an appropriate literature background, demonstrate proficiency with proposed experimental/computational techniques, identify details of the experiments to be performed, and provide a timeline to final defense.

The student's committee will pass or fail the student on the strength of the preliminary examination, with an option to conditionally pass the student while requiring an interim committee meeting prior to the final Ph.D. examination. A form sent by the student's adviser to the Office of the Registrar reports the results of the examination.

*M.S. Thesis or Ph.D. Final Examination (Dissertation Defense)*

All M.S. Plan A and Ph.D. students must orally defend their thesis or dissertation at a public final examination. If, for any reason, a student's Ph.D. research goals are substantially changed after successful completion of the preliminary examination, the student must arrange a subsequent meeting to provide their committee with an accurate and current overview of their proposed work. The final examination consists of a public thesis defense in oral presentation format. At least two weeks before the examination, the student must provide each member of the graduate committee with a copy of the written thesis of Ph.D. dissertation and provide the department an announcement of their defense for advertisement by bulletin

board, e-mail, or other means. The results of the examination are reported on the Completion of Requirements form. Often, graduate committee members request changes in the thesis or dissertation, and they may postpone signing the form until they are satisfied that those changes have been made.

*Publication of Thesis or Dissertation*

After the defense, an electronic copy (in PDF format) of the thesis or dissertation must be uploaded in accordance with the directions provided on the Graduate Student Resources web site. This copy will be rejected if the format standards specified by the Thesis and Dissertation Format Guide are not met. This guide allows for a publication-ready format. If required by the department and/or committee, additional printed copies should be delivered to the University Store for binding. A bound copy must be submitted to the Department of Chemical and Petroleum Engineering for the departmental library. Most students will want one or more copies for their own use. Students should consult with the adviser to determine if the adviser wants a copy of the thesis, dissertation, or other research documentation.

**Chemical Engineering (CHE)**

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).**

**1005. Introduction to Chemical Engineering. 1.** Provides an overview of chemical engineering and its role in the current technological importance: energy, biotechnology, production of chemicals, and materials processing. Introduces strategies for solving engineering problems, including ethical considerations and teamwork, discusses process variables, units, mass balance, and data analysis, and incorporates active learning exercises using spreadsheet to solve chemical engineering problems. *Prerequisites:* CHEM 1050 or CHEM 1020, and PHYS 1210.

**2005 [3000]. Chemical Process Analysis. 3.** Introduces analysis of chemical processes using stoichiometry, material and energy balances, thermodynamics and economics. Introduces analysis of safety, health, and environment. *Prerequisite:* C or better in MATH 2205 and either CHEM 1050 or CHEM 1020. (Normally offered fall semester)

**2060. Introduction to Chemical Engineering Computing. 3.** Introduces chemical engineering problems, develops computational skills needed to solve them, and reinforces



a computational tool that will be useful for other CHE classes. *Prerequisites:* Grade of C or better in ES 1060 and concurrent enrollment in MATH 2310. (Normally offered spring semester)

**3015 [3010]. Multicomponent Thermodynamics. 3.** Introduces mixture properties, such as chemical potentials, excess properties, partial molar properties, heats of mixing, fugacities, and practical tools for estimating them from solution theories and equations of state. These tools and concepts are applied to phase and chemical equilibria. Cross listed with PETE 3015. *Prerequisite:* ES 2310, CHE 2060 or PETE 2060. (Normally offered fall semester)

**3025 [3020]. Transport Phenomena. 3.** Introduces energy and mass transfer concepts and the development of mathematical models of physical phenomena, including convection, diffusion, conduction and radiation, applicable to the analysis and design of chemical processes. Cross listed with PETE 3025. *Prerequisites:* C or better in ES 2330 and CHE 2005. (Normally offered fall semester)

**3030. Unit Operations. 3.** Applies transport and equilibrium concepts and models to the analysis and design of unit operations, such as distillation, absorption, extraction, crystallization, membrane, and heat exchange processes. Cross listed with PETE 3030. *Prerequisites:* CHE 2005, 3015, and 3025. (Normally offered spring semester)

**3040. Unit Operations Laboratory I. 3. [WB◀(none)]** Illustrates fluid-flow and heat-transfer principles with experiments, for example, on pipe flow, fluid viscosity and convective heat transfer. Emphasizes experimental-error analysis and technical communication, both written and oral. *Prerequisite:* WA, CHE 3025. (Normally offered fall semester)

**3070. Process Simulation and Economics. 3.** Introduces the process simulation software used in the chemical industry and its applications, including examples of heat and material balances, physical properties, phase and chemical equilibria, equilibrium-stage separations and costs and profitability analysis. *Prerequisites:* concurrent enrollment in CHE 3015 and CHE 3030.

**3900. Undergraduate Research. 1-6 (Max. 6).** Students carry out research appropriate to undergraduates, under faculty supervision. May be taken more than once. *Prerequisite:* junior standing in chemical engineering. (Normally offered each semester)

**4000. Environment, Technology and Society. 3.** Explores relationships among technology, the environment and society. Examines social and humanistic aspects of using current

and future technology to understand and solve environmental problems. Cross listed with PETE 4000. *Prerequisites:* junior standing and completion of two university studies science courses (SB, SP, SE).

**4050. Unit Operations Laboratory II. 3.** Illustrates mass-transfer principles with experiments, for example, on extraction, gas absorption, and distillation. Emphasizes experiment planning and technical communication, both written and oral. *Prerequisite:* CHE 3030. (Normally offered spring semester)

**4060. Reaction Engineering. 3.** Introduces chemical process kinetics, catalysis and reactor design. Includes homogeneous and heterogeneous reaction kinetics; design of batch, stirred-tank and tubular reactors; and non-isothermal operation. *Prerequisites:* CHE 3015 and 3025. (Normally offered spring semester)

**4070. Process Design I. 3.** Encompasses engineering design of chemical processes. Introduces engineering economics, process safety management and environmental management. *Prerequisites:* CHE 3030, 3070 and 4060 or concurrent enrollment. (Normally offered fall semester)

**4080. Process Design II. 5. [WC◀COM3]** Intended for the last semester of the senior year. Applies all previous courses to the design of safe, economical and environmentally benign chemical processes. *Prerequisite:* CHE 3040, 4070.

**4090. Process Dynamics and Control. 3.** Encompasses analysis and design control systems for the chemical process industry including steady-state approximation, types of controllers, simple unsteady-state analysis, use of mathematical models and process dynamics under control. *Prerequisites:* CHE 3025, 3030 and 4060.

**4100. Biochemical Engineering. 3.** Applies chemical engineering principles to the analysis and design of biological processes widely used in the pharmaceutical, food and environmental remediation industries. Topics include kinetics of enzyme-catalyzed reactions, cellular growth and metabolism, bioreactor design and mass transfer considerations. Dual listed with CHE 5100. *Prerequisites:* MOLB 2021 or concurrent enrollment and CHE 4060 or concurrent enrollment.

**4110. Air Pollution for Chemical Engineers. 3.** Focuses on strategies and technologies for complying with air pollution control regulations. Introduces atmospheric mixing and dispersion modeling to describe impact of process air emissions on the environment. Examines chemistries of pollutant production and atmospheric fate of air pollutants. *Prerequisite:* CHE 2005.

**4160. Biomedical Engineering-Transport Processes. 3.** Focuses on chemical and physical transport processes with applications toward the development of drug delivery systems, artificial organs, bioartificial organs and tissue engineering. Involves topics covering body fluids, capillary solute transport, physical and flow properties of blood, tissue oxygen transport, pharmacokinetic models and cell physiology. *Prerequisites:* consent of instructor and grade of C or better in at least three courses counting no more than two from CHEM 1020, CHEM 1030, CHEM 1050, LIFE 1010, LIFE 1020 and at least one from LIFE 2022, MATH 2200, KIN 2040, MOLB 2021, MOLB 2240, CHE 3000, ES 2310.

**4170. Polymeric Materials Synthesis. 3.** An introduction to the polymer technology, with emphasis on the synthesis of polymeric materials and on the polymerization processes. Applications cover commodity polymers, such as polyolefins and advanced materials, such as nanomaterials, aerospace materials and biomaterials for drug delivery, artificial tissues and organs. *Prerequisite:* CHEM 2340 or 2440.

**4190. Polymeric Materials: Characterization and Properties. 3.** Intended for science and engineering students, an introduction to the characterization and properties of polymeric materials. Introduces synthesis, architecture, molecular microstructure analysis, molecular weight determination, solution properties, thermal properties and mechanical properties of polymeric materials. Dual listed with CHE 5190. *Prerequisite:* CHEM 4507.

**4200. Industrial Chemical Production. 3.** Integration of chemical engineering and chemistry as practiced in modern industry. Engineering of chemical reactions and processes for commodity chemicals, petroleum-based fuels, petrochemicals, intermediates, specialty chemicals, pharmaceuticals, and engineered materials. Environmental strategies for waste minimization and pollution prevention. *Prerequisites:* CHEM 2420 and CHE 3015 (may be taken concurrently).

**4210. Natural Gas Processes and Modeling. 3.** After a quick introduction to the Hysys simulation program, the main chemical processes used to convert well-head gas to products will be reviewed and modeled (fractionation train, sulfur recovery, tail gas clean-up, dehydration, refrigeration, nitrogen rejection) in high detail, including appropriate property models to use. *Prerequisite:* CHE 3070.

**4270. Advanced Process Simulation. 3.** Advanced topics for a commercial process simulation software that is routinely used in industry will be covered. Topics will include: electrolyte systems, physical property meth-

ods and regression of parameters, petroleum industry component selection and distillation, solids handling capabilities including coal processing, advanced recycle stream convergence techniques, and equation-oriented solution methods. *Prerequisite:* CHE 3070.

**4340. Numerical Analysis. 3.** Considers computer methods and their accuracy for applied mathematics. Topics include machine arithmetic, analysis of rounding error, solution methods for linear systems and nonlinear equations, interpolations, numerical differentiation, and numerical solution of differential equations. Includes some programming. *Prerequisites:* grade of C or better in COSC 1010, MATH 2310, and either MATH 2250 or 3310.

**4970. Internship in Chemical Engineering. 1-6 (Max. 6).** Enables credit for students in appropriate engineering activities while serving as interns in an industrial, government, or other setting. *Prerequisite:* must be involved in a chemical engineering co-op/internship experience.

**4990. Topics in Chemical Engineering. 1-6 (Max. 6).** Features topics not included in regularly offered classes. Section I is individual study. Other sections are group study by seminar or in class format. *Prerequisite:* CHE 3000 or concurrent enrollment.

**5010. Transport Phenomena. 3.** Examines the modeling of momentum, heat and mass transport. Cross Listed with PETE 5010. *Prerequisite:* ES 2330, MATH 2310, and graduate standing in Chemical or Petroleum Engineering.

**5020. Thermodynamics. 3.** Examines molecular thermodynamics of pure materials and mixtures, including phase equilibria and the use of equations of state. Cross listed with PETE 5020. *Prerequisite:* ES 2310 or CHEM 4505.

**5030. Reaction Kinetics. 3.** An analysis of reactions involving phase boundaries, heterogeneous catalysis, gas-solid systems, and gas-liquid systems. Cross listed with PETE 5030. *Prerequisite:* CHE 4060.

**5045. Reactor Design. 3.** Examines reactor design techniques, including the use of thermodynamics, kinetics, heat transfer, and mass transfer. Cross listed with PETE 5045. *Prerequisite:* CHE 4060.

**5050. Structure and Properties of Porous Media. 3.** Introduction to porous materials, pore structure and mineralogy of reservoir rocks. Fundamentals of porosity, permeability, and capillary properties of porous materials. Application to hydrocarbon reservoirs. Cross listed with PETE 5050. *Prerequisite:* graduate standing.

**5060. Flow Thru Porous Media. 3.** Review of properties of porous media. Relationships of permeability to porosity. Formulation of the Fundamental Flow equation. Constant Rate Solutions. Constant Pressure Solutions. The Principle of Superposition. Transient well testing of oil and gas reservoirs, including draw-down, build-up faulted systems, interference, drillstem tests, and isochronal test analysis. Dual listed with PETE 5060. *Prerequisite:* PETE 3200 and graduate standing.

**5070. Multiphase Flow. 3.** A thorough background in the methods of analysis and current developments in gas-liquid, gas-solid, liquid-solid, and gas-liquid-solid flows. Introduction to multiphase flow instrumentation. Identical to PETE 5070. *Prerequisite:* ME 3360 or CHE 3025.

**5080. Interfacial Phenomena. 3.** Introduction to surface and colloid chemistry, coagulation and flocculation, surface energy and thermodynamics of surfaces, adsorption at interfaces, surface tension, capillarity and wetting, spontaneous imbibition, applications to hydrocarbon reservoirs and oil recovery. Cross listed with PETE 5080. *Prerequisite:* graduate standing.

**5090. Graduate Teaching and Research: Theory and Methods. 3.** A general approach to scientific research and graduate school. Topics include: purpose of graduate school, careers with graduate degrees, communication basics, literature search skills, presentations, research instrumentation, the scientific methods, developing hypotheses, grant proposal, and paper writing, research ethics, copyrights, patents, research notebooks, and classroom teaching techniques. *Prerequisite:* graduate standing.

**5100. Biochemical Engineering. 3.** Applies chemical engineering principles to the analysis and design of biological processes widely used in the pharmaceutical, food and environmental remediation industries. Topics include kinetics of enzyme-catalyzed reactions, cellular growth and metabolism, bioreactor design and mass transfer considerations. Dual listed with CHE 4100. *Prerequisite:* MOLB 2021 or concurrent enrollment and CHE 4060 or concurrent enrollment.

**5130. Staged Operations. 3.** Thermodynamic and mathematical analysis of stagewise mass transfer operations. Distillation, absorption, and extraction are discussed. *Prerequisite:* CHE 3030, CHE 5040 or concurrent enrollment.

**5140. Computational Methods I. 3.** First semester of a three-semester computational methods series. Review of iterative solutions of linear and nonlinear systems of equations, polynomial interpolation/approximation, numerical integration and differentiation,

and basic ideas of Monte Carlo methods. Comparison of numerical techniques for programming time and space requirements, as well as convergence and stability. Identical to COSC 5310 and MATH 5310. Cross listed with PETE/ME/CE 5140. *Prerequisite:* MATH 3310, COSC 1010.

**5150. Topics in Chemical Engineering. 1-3 (Max. 12).** Selected topics in chemical engineering. Cross listed with PETE 5150. *Prerequisite:* consent of instructor.

**5160. Biomedical Engineering - Transport Processes. 3.** Focuses on chemical and physical transport processes with applications toward the development of drug delivery systems, artificial organs, bioartificial organs and tissue engineering. This will involve topics covering body fluids, capillary solute transport, physical and flow properties of blood, tissue oxygen transport, pharmacokinetic models and cell physiology. Dual listed with CHE 4160. *Prerequisite:* consent of instructor and grade of C or better in at least 3 courses counting no more than 2 from CHEM 1020, CHEM 1030, CHEM 1050, LIFE 1010, LIFE 1020 and at least one from LIFE 2022, MATH 2200, KIN 2040, MOLB 2021, MOLB 2240, CHE 3000, ES 2310, graduate standing.

**5170. Polymeric Materials Synthesis. 3.** An introduction to the polymer technology, with emphasis on the synthesis of polymeric materials and on the polymerization processes. Applications will cover commodity polymers such as polyolefins, and advanced materials, such as nanomaterials, aerospace materials and biomaterials for drug delivery, artificial skin and organs. Dual Listed with CHE 4170. *Prerequisite:* CHEM 2340 or CHEM 2440, graduate standing.

**5180. Molecular Biophysics. 3.** Organized into five sections that cover 1) Confrontation of biopolymers 2) Dynamics of biopolymers 3) Hydration of biopolymers 4) Biopolymers as poly-electrolytes and 5) Association between molecules with topics to include equilibrium studies and ligand/receptor binding and linkage. *Prerequisite:* MOLB 4600/5600 or CHEM 4507.

**5190. Polymeric Materials: Characterization and Properties. 3.** Intended for science and engineering students, is an introduction to the characterization and properties of polymeric materials. Introduces synthesis, architecture, microstructure analysis, molecular weight determination, solution properties, thermal properties and mechanical properties of polymeric materials. Dual listed with CHE 4190. *Prerequisite:* CHEM 4507.

**5230. Advanced Catalysis and Characterization. 3.** Focus on modern ideas and techniques used to describe gas-solid interactions, including adsorption and chemical reactions. The usefulness of photon and electron spectroscopies for evaluating the structure of real catalysts will be discussed. Catalysis of important classes of chemical reactions will be related to results obtained by various materials characterization methods. *Prerequisite:* CHE 5030.

**5355. Mathematical Methods in Chemical Engineering. 3.** Covers mathematical modeling: conservation laws and constitution relationships; partial differential equations (PDEs): the types and analytical solution techniques; applied linear algebra; matrices and Eigen-analysis; numerical solution techniques: finite difference and finite element methods, Newton-Raphson method, and temporal discretization techniques, and linear solution techniques: direct and iterative methods. Cross listed with PETE 5355. *Prerequisites:* MATH 2210, CHE/PETE 3025 or equivalent.

**5410. Advanced Biological Wastewater Treatment. 3.** Theory and practice of advanced biological treatment processes for municipal and industrial wastewaters, sludges, groundwater bioremediation and solid waste. Emphasis is on fundamental principles applied to the design and control of existing processes and the development of innovative systems. Cross listed with CE/ENVE 5410. *Prerequisites:* consent of instructor.

**5440. Fluid Mechanics. 3.** Lagrangian and Eulerian coordinates, Navier-Stokes equations, momentum balance, fluid statics, strain rate and vorticity, irrotational flow, and laminar viscous flow including exact solutions and boundary layers. Cross listed with ME 5440.

**5442. Advanced Fluid Mechanics. 3.** Introduction to inviscid and viscous hydrodynamic stability; closure in turbulent flows; vorticity and vortex dynamics; theoretical aerodynamics; numerical simulations of viscous flows; experimental methods in fluid flows. *Prerequisite:* ME 5440.

**5530. Advanced Mass Transfer. 3.** Consideration of diffusional phenomena and processes. Topics include flux laws, diffusion coefficient prediction, steady and unsteady state diffusion in non-flowing systems (with and without chemical reaction), convective diffusion, and diffusion-based separation processes.

**5700. Fundamentals of Coal Utilization. 3.** Following introduction to coal structure, constituents and classification, fundamental principles of coal utilization technologies will be examined. The topics to be covered include behavior of coal stockpiles, drying, pyrolysis,

combustion/gasification of coal. Reactor models for utilization of coal will be discussed with reference to current environmental issues and remediation. *Prerequisite:* graduate standing.

**5710. Advances in Fluidization Technology. 3.** Covers particle classification, hydrodynamics, advanced modeling strategies, and technical applications of fluidization. *Prerequisite:* graduate level.

**5870. Mathematical Modeling of Processes. 3.** Introduction to techniques in the process of constructing mathematical models. Application of the techniques to areas such as petroleum reservoir simulation, chemical process industry operations and plant start-up. Identical to MATH 5320. *Prerequisite:* CHE/PETE 5140 and graduate standing.

**5880. Problems in Chemical Engineering. 1-6 (Max. 6).** A special course designed to make possible the study and investigation of problems or phases of chemical engineering selected to fit the needs of the student. *Prerequisite:* graduate standing in engineering.

**5890. Chemical and Petroleum Engineering Seminar. 1 (Max. 9).** Departmental seminar on current research with formal training for student presentation of technical papers. Satisfactory/unsatisfactory only. Cross listed with PETE 5890. *Prerequisite:* graduate standing.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrolled in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Graduate level course designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrolled in a graduate level degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Petroleum Engineering

Petroleum Engineering trains students for Wyoming's largest industries, the production of crude oil and gas. With the recognition of the state's and nation's vast reserves of natural gas, the curriculum emphasizes the production and processing of this important resource. Because of American predominance in petroleum technology, career opportunities are available throughout most of the world.

The curriculum in petroleum engineering is based upon sound preparation in fundamental sciences, mathematics, physics, chemistry, and geology. The essentials of engineering are added to this foundation: computer programming, statics, dynamics, materials science, hydraulics, and thermodynamics. To aid in developing individuals' social potential and broaden their educational background, an integrated program in humanities and social sciences is included in the curriculum. Petroleum engineering courses, which are primarily concerned with application of previously acquired knowledge to problems of the oil and gas industry, are concentrated in the junior and senior years.

Petroleum Engineering degree candidates must meet the academic requirements of the college and, in addition, must have a GPA of 2.0 in Petroleum Engineering courses attempted at UW that are applied toward graduation for the B.S. degree from the department. For approved electives, students must have prior approval of their adviser and department head. Courses must be chosen from a list provided by the department.

## Petroleum Engineering Program Educational Objectives

Three to six years after graduation, graduates who choose to practice in Petroleum Engineering should:

- Successfully practice the profession of Petroleum Engineering;
- Demonstrate successful career growth

## Petroleum Engineering Program Outcomes

During the course of study in Petroleum Engineering, the student should develop:

- an ability to apply knowledge of mathematics, science, and engineering;

- an ability to design and conduct experiments, as well as to analyze and interpret data;
- an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
- an ability to function on multidisciplinary teams;
- an ability to identify, formulate, and solve engineering problems;
- an understanding of professional and ethical responsibility;
- an ability to communicate effectively;
- the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
- a recognition of the need for, and ability to engage in life-long learning;
- a knowledge of contemporary issues;
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

### Petroleum Engineering Curriculum

For students entering UW Fall 2015 or later

<b>FRESHMAN YEAR: Fall</b>		<b>Hrs.</b>
First-Year Seminar (FYS)	.....	3
CHEM 1020 (PN)	.....	4
GEOL 1100 (PN)	.....	4
MATH 2200 (Q)	.....	4
PETE 1060	.....	1
<b>Total Hrs.</b>		<b>16</b>

<b>FRESHMAN YEAR: Spring</b>		<b>Hrs.</b>
U.S. & Wyoming Constitutions (V)	.....	3
CHEM 1030	.....	4
ES 2110	.....	3
MATH 2205	.....	4
ENGL 1010 (COM1)	.....	3
<b>Total Hrs.</b>		<b>17</b>

<b>SOPHOMORE YEAR: Fall</b>		<b>Hrs.</b>
MATH 2210	.....	4
MATH 2310	.....	3
ES 2120	.....	3
ES 2410	.....	3
COJO 2010 (COM2)	.....	3
<b>Total Hrs.</b>		<b>16</b>

<b>SOPHOMORE YEAR: Spring</b>		<b>Hrs.</b>
PETE 2050	.....	3
ES 2310	.....	3
ES 2330	.....	3
CHEM 2300	.....	4
Human Culture Elective (H)	.....	3
<b>Total Hrs.</b>		<b>16</b>

<b>JUNIOR YEAR: Fall</b>		<b>Hrs.</b>
PHYS 1220	.....	4
PETE 2060	.....	3
PETE 3100	.....	2
PETE 3255	.....	3
PETE 3015	.....	3
<b>Total Hrs.</b>		<b>15</b>

<b>JUNIOR YEAR: Spring</b>		<b>Hrs.</b>
PETE 3200	.....	3
PETE 3265	.....	3
PETE 3715	.....	3
PETE 3725	.....	3
PETE 4320	.....	3
<b>Total Hrs.</b>		<b>15</b>

<b>SENIOR YEAR: Fall</b>		<b>Hrs.</b>
PETE 4225	.....	2
PETE 4340	.....	3
Human Culture Elective (H)	.....	3
Technical Elective	.....	3
Technical Elective	.....	3
Technical Elective	.....	3
<b>Total Hrs.</b>		<b>17</b>

<b>SENIOR YEAR: Spring</b>		<b>Hrs.</b>
PETE 4735	.....	4
GEOL 4190	.....	3
Technical Elective	.....	3
Technical Elective	.....	3
Technical Elective	.....	3
<b>Total Hrs.</b>		<b>16</b>

Notes: Technical Electives must be selected with an advisor's approval. At least 2 of the 6 Technical Electives must be PETE courses. 1 of the 6 Technical Electives must be GEOL courses.

### Petroleum Engineering (PETE)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB↔Q]).

**1060. Introduction to Petroleum Engineering. 1.** Covers elements of Petroleum Engineering calculations associated with typical computations in Drilling, Production, and Reservoir Engineering, Rock and Fluids properties, to simultaneously train the student on basic computing skills as well as basic language of Petroleum Engineering. The preferred computing tool is Matlab, which will be introduced through simple calculations on the computer. Notions of the petroleum engineering curriculum will also be provided through examples of the different subjects. *Prerequisite:* Math placement 5 or concurrent enrollment in MATH 2200.

**2050 [3000]. Introduction to Petroleum Engineering. 3.** General introduction to petroleum engineering, including physical

properties of reservoir rock, single phase fluid flow through porous media, surface forces, fluid saturation's, drilling fundamentals, methods of production, completion technology and petroleum reservoir field data. *Prerequisites:* MATH 2205.

**2060. Introduction to Petroleum Engineering Computing. 3.** Introduces Petroleum Engineering problems and principles, develops computational skills needed to solve them, and reinforces a computational tool that will be useful for other Petroleum Engineering classes. *Prerequisites:* grade of C or better in ES 1060, concurrent enrollment in MATH 2310.

**3015 [3010]. Multicomponent Thermodynamics. 3.** Introduces mixture properties, such as chemical potentials, excess properties, partial molar properties, heats of mixing, fugacities, and practical tools for estimating them from solution theories and equations of state. These tools and concepts are applied to phase and chemical equilibria. Cross listed with CHE 3015. *Prerequisite:* ES 2310, CHE 2060 or PETE 2060. (Normally offered fall semester)

**3025 [3020]. Transport Phenomena. 3.** Introduces energy and mass transfer concepts and the development of mathematical models of physical phenomena, including convection, diffusion, conduction and radiation, applicable to the analysis and design of chemical processes. Cross listed with CHE 3025. *Prerequisites:* C or better in ES 2330 and CHE 2005. (Normally offered fall semester)

**3030. Unit Operations. 3.** Applies transport and equilibrium concepts and models to the analysis and design of unit operations, such as distillation, absorption, extraction, crystallization, membrane, and heat exchange processes. Cross listed with CHE 3030. *Prerequisites:* CHE 2005, 3015, and 3025.

**3100. Rock and Fluids Lab. 2.** Provides understanding of principles of rock and fluid properties and their measurement as part of conventional and special core analysis, as well as PVT characteristics of reservoir fluids. Students are expected to understand how to measure important rock and fluid properties using laboratory equipment, as part of reservoir characterization routines, formation damage evaluations and well log calibration protocols. Students are also expected to learn how to write succinct and organized reports. *Prerequisites:* PETE 2050.

**3200 [4010]. Reservoir Mechanics. 3.** Examines use of material balance equation. Studies principles of fluid mechanics applied to single and multiphase flow of fluids in porous media and decline curve analysis. *Prerequisite:* PETE 2050. (Normally offered spring semester)

**3255. Basic Drilling Engineering. 3.** Principles and practices of oil and gas well rotary drilling, including rock mechanics, drilling hydraulics, drilling fluids, and hole deviation. Drilling equipment analysis, casing design, and drilling fluid properties. Application of modern computer-based analysis and design methods. *Prerequisites:* ES 2310, ES 2330, or consent of the instructor.

**3265. Drilling Fluids Laboratory. 3.** Measurements of physical and chemical properties of drilling fluids. Includes experiments on mud rheological properties, mud weight, water loss, mud contaminants and their treatments. Includes processing and interpretation of data and writing technical reports of their work. *Prerequisites:* ES 2310, 2230, and PETE 3255.

**3715. Production Engineering. 3.** Provides elements for design and analysis of surface production processes, including fluid separation, pumping and compression, measurement and treatment of production fluids, basic design of artificial lift system, and analysis and optimization of production systems. *Prerequisites:* PETE 2050, ES 2310, ES 2330.

**3725. Well Bore Operations. 3.** Covers many facets of completion and intervention technology. The material progresses through each of the major design, diagnostic and intervention technologies, ending with effect of operations on surface facilities and finally plug and abandonment requirements. *Prerequisites:* PETE 2050, ES 2410.

**3900. Undergraduate Research in Petroleum Engineering. 1-6 (Max. 6).** Students carry out research appropriate to undergraduates, under faculty supervision. May be taken more than once. *Prerequisites:* junior standing in petroleum engineering or consent of instructor.

**4000. Environment, Technology and Society. 3.** Explores relationships among technology, the environment and society. Studies social and humanistic aspects of using current and future technology to understand and solve environmental problems. Cross listed with CHE 4000. *Prerequisites:* junior standing and completion of two university studies science courses (SB, SP, SE).

**4030 [3010]. Rock and Fluid Properties. 3.** Reservoir rocks - mineralogy, deposition, diagenesis, porosity, permeability, pore space imaging. Coring and core analysis. Intermolecular forces and fluid properties. Fundamentals of wetting and capillarity. Hydrocarbon distribution. Chemistry of crude oils. Oil-brine-rock interactions, formation damage, reservoir wettability, and oil recovery. *Prerequisite:* PETE 2050.

**4060 [4220]. Flow Through Porous Media. 3.** Review of properties of porous media. Relationships of permeability to porosity. Formulation of Fundamental Flow Equation. Constant Rate Solutions. Constant Pressure Solutions. The Principles of Superposition. Transient well testing of oil and gas reservoirs, including drawdown, build-up, faulted systems, interference, drillstem tests, isochronal test analysis. Dual listed with PETE 5060. *Prerequisite:* PETE 3200. (Normally offered fall semester)

**4200. Natural Gas Engineering. 3.** Studies development of natural gas reservoirs for normal production and as storage fields. Includes back pressure tests, hydrates, pipeline problems, cycling and use of the material balance equation. Also processing of natural gas, including compression, expansion, refrigeration, separation, sour gas treating, sulfur recovery, LNG production and carbon dioxide separation. *Prerequisites:* PETE 2050. (Normally offered fall semester)

**4215. Rock Mechanics. 3.** Covers rock mechanical properties, stress and strain in rock and rock masses, rock failure mechanisms, thermal-hydraulic-mechanical-chemical (THMC) coupling, and their applications to ground surface subsidence/uplift, borehole instability, and hydraulic fracturing. Dual listed with PETE 5215. *Prerequisites:* ES 2330 and 2410.

**4225. Well Test Analysis. 2.** Aims to present the fundamental concepts of well test analysis. The mathematical formulations presented are a critical facet of the methodology used in the interpretation. The formation gathered from the interpretation will help analyze, improve, and forecast the potential of the well and the reservoir. *Prerequisite:* PETE 3200.

**4250 [3250]. Drilling Engineering. 3.** Principles and practices of rotary drilling, including rock mechanics, hydraulics, drilling fluids and hole deviation. Oil and gas drilling equipment models. Drilling fluid tests, casing design. *Prerequisite:* PETE 2050.

**4320. Well Log Interpretation. 3.** Studies use of various types of open hole logs for quantitative evaluation of formations. *Prerequisites:* PETE 2050. (Normally offered spring semester)

**4340. Petroleum Economics. 3.** Applies principles of economics to petroleum properties. Studies taxation, present worth, rate of return, payout and decisions under uncertainty. *Prerequisite:* PETE 3200. (Normally offered fall semester)

**4720. Petroleum Engineering Design I. 3. [WB,O◀(none)]** Design and development of petroleum reservoirs using principles and skills learned in the Petroleum Engineering

program. Application of software for design and analysis of the drilling, reservoir and production of petroleum fields. *Prerequisites:* PETE 3200, 3255, 3715 and 3725.

**4735. Petroleum Engineering Design II. 4. [WC,O◀(none)]** Design and development of petroleum reservoirs using principles and skills learned in the Petroleum Engineering program. Application of software for design and analysis of the drilling, reservoir and production of petroleum. A continuation of PETE 4720. *Prerequisite:* PETE 4720.

**4810. Unconventional Gas Production. 3.** Study of resource base, drilling, completion and production technology, and reservoir characteristics for tight gas sands. Devonian shales, coalbed methane, geopressured aquifers, and hydrates. Case histories and economics are presented in each of these. Dual listed with PETE 5810. *Prerequisite:* graduate status or consent of instructor.

**4830. Thermal Recovery. 3.** Objective of this course is to examine and explore in depth the theoretical and applied aspects of thermal recovery process of producing hydrocarbons including state-of-the-art review. Dual listed with PETE 5830. *Prerequisite:* Senior standing in petroleum or chemical engineering.

**4970. Internship in Petroleum Engineering. 1-6 (Max. 6).** Enables credit for students in appropriate engineering activities while serving as interns in an industrial, government, or other setting. *Prerequisites:* Must be involved in a petroleum engineering co-op/internship experience; consent of instructor.

**4990. Topics in Petroleum Engineering. 1-6 (Max. 6).** Features topics not included in regularly offered classes. Section I is individual study. Other sections are group study by seminar or in class format. *Prerequisites:* PETE 2050 or concurrent enrollment.

**5010. Transport Phenomena. 3.** Examines the modeling of momentum, heat and mass transport. Cross listed with CHE 5010. *Prerequisite:* ES 2330, MATH 2310, and graduate standing in Chemical or Petroleum Engineering.

**5015. Secondary Recovery. 3.** Conventional secondary recover practices, including: flood patterns, gas injection, waterflooding, and water treatment for water flooding. *Prerequisite:* PETE 3200.

**5020. Thermodynamics. 3.** Examines molecular thermodynamics of pure materials and mixtures, including phase equilibria and the use of equations of state. Cross listed with CHE 5020. *Prerequisite:* ES 2310 or CHEM 4505.

**5030. Reaction Kinetics. 3.** An analysis of reactions involving phase boundaries, heterogeneous catalysis, gas-solid systems, and gas-liquid systems. Cross listed with CHE 5030. *Prerequisite:* CHE 4060.

**5045. Reactor Design. 3.** Examines reactor design techniques, including the use of thermodynamics, kinetics, heat transfer, and mass transfer. Cross listed with CHE 5045. *Prerequisite:* CHE 4060.

**5050. Structure and Properties of Porous Media. 3.** Introduction to porous materials, pore structure and mineralogy of reservoir rocks. Fundamentals of porosity, permeability, and capillary properties of porous materials. Application to hydrocarbon reservoirs. Cross listed with CHE 5050. *Prerequisite:* graduate standing.

**5060. Flow in Porous Media. 3.** Review of properties of porous media. Relationships of permeability to porosity. Formulation of the Fundamental Flow equation. Constant Rate solutions. Constant Pressure Solutions. The Principle of Superposition. Transient well testing of oil and gas reservoirs, including drawdown, build-up, faulted systems, interference, drillstem tests, and isochronal test analysis. Dual listed with PETE 4060; cross listed with CHE 5060. *Prerequisite:* PETE 3200 and graduate standing.

**5070. Multiphase Flow. 3.** A thorough background in the methods of analysis and current developments in gas-liquid, gas-solid, liquid-solid, and gas-liquid-solid flows. Introduction to multiphase flow instrumentation. Identical to CHE 5070. *Prerequisite:* ME 3360 or CHE 3020.

**5080. Interfacial Phenomena. 3.** Introduction to surface and colloid chemistry, coagulation and flocculation, surface energy and thermodynamics of surfaces, adsorption at interfaces, surface tension, capillarity and wetting, spontaneous imbibition, applications to hydrocarbon reservoirs and oil recovery. Cross listed with CHE 5080. *Prerequisite:* graduate standing.

**5100. Topics. 1-3 (Max. 12).** Selected topics in petroleum engineering. *Prerequisite:* consent of instructor.

**5140. Computational Methods I. 3.** First semester of a three-semester computational methods series. Review of iterative solutions of linear and nonlinear systems of equations, polynomial interpolation/approximation, numerical integration and differentiation, and basic ideas of Monte Carlo methods. Comparison of numerical techniques for programming time and space requirements, as well as con-

vergence and stability. Identical to ME 5140, CE 5140, CHE 5140, COSC 5310 and MATH 5310. *Prerequisite:* MATH 3310, COSC 1010.

**5150. Topics in Chemical Engineering. 1-3 (Max. 12).** Selected topics in chemical engineering. Cross listed with CHE 5150. *Prerequisite:* consent of instructor.

**5200. Problems in Petroleum Engineering. 1-3 (Max. 6).** Selected topics in petroleum engineering. *Prerequisite:* doctoral student and consent of instructor.

**5215. Rock Mechanics. 3.** Covers rock mechanical properties, stress and strain in rock and rock masses, rock failure mechanisms, thermal-hydraulic-mechanical-chemical (THMC) coupling, and their applications to ground surface subsidence/uplift, borehole instability, and hydraulic fracturing. Dual listed with PETE 4215. *Prerequisites:* ES 2330 and 2410.

**5255. Advanced Drilling Engineering. 3.** Principles and practices of advanced topics in oil and gas drilling engineering including advances in directional and horizontal drilling, drilling fluid hydraulics and cuttings transport. Non-Newtonian Fluid Flow Analysis, pore pressures and fracture resistance estimation methods. Application of modern computer-based analysis and design methods. *Prerequisites:* PETE 4250.

**5300. Reservoir Simulation. 3.** Simulation of petroleum reservoirs, formulation of equations, finite difference methods of solution, data preparation and input, history matching case studies. Dual listed with PETE 4300. *Prerequisite:* PETE 3200 MATH 4440, 2210.

**5310. Fundamentals of EOR. 3.** The application of physical principles to increasing the recovery from reservoirs. Miscible fluid flooding in-situ combustion, and thermal recovery. Dual listed with PETE 4310. *Prerequisite:* PETE 3200.

**5355. Mathematical Methods in Chemical Engineering. 3.** Covers mathematical modeling: conservation laws and constitution relationships; partial differential equations (PDEs): the types and analytical solution techniques; applied linear algebra; matrices and Eigen-analysis; numerical solution techniques: finite difference and finite element methods, Newton-Raphson method, and temporal discretization techniques, and linear solution techniques: direct and iterative methods. Cross listed with CHE 5355. *Prerequisites:* MATH 2210, CHE/PETE 3025 or equivalent.

**5600. Air Pollution Control. 3.** Coverage includes science and engineering of air pollution sources, formation mechanisms, and

removal of pollutants including discussion on air pollution effects. Cross listed with CHE 5600. *Prerequisite:* CHEM 1060 or CHEM 1030, MATH 2310.

**5810. Unconventional Gas Production. 3.** Study of resource base, drilling, completion and production technology, and reservoir characteristics for tight gas sands. Devonian shales, coalbed methane, geopressured aquifers, and hydrates. Case histories and economics are presented in each of these. Dual listed with PETE 4810. *Prerequisite:* graduate status or consent of instructor.

**5830. Thermal Recovery. 3.** Objective of this course is to examine and explore in depth the theoretical and applied aspects of thermal recovery process of producing hydrocarbons including state-of-the-art review. Dual listed with PETE 4830. *Prerequisite:* Senior standing in petroleum or chemical engineering.

**5840. Miscible Processes. 3.** Objective is to examine and explore in depth the theoretical and applied aspects of miscible processes of producing hydrocarbons including state-of-the-art review. *Prerequisite:* PETE 4010, 5310.

**5850. Chemical Enhanced Oil Recovery Processes. 3.** Objective is to examine and explore in depth the theoretical and applied aspects of the classification of enhanced oil recovery processes called chemical processes. *Prerequisite:* consent of instructor.

**5890. Chemical and Petroleum Engineering Graduate Seminar. 1 (Max. 9).** Departmental seminar on current research with formal training for student presentation of technical papers. Cross listed with CHE 5890. *Prerequisite:* graduate standing.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Department of Civil and Architectural Engineering

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Interim Department Head: **Anthony S. Denzer**

### Professors:

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### Assistant Professors:

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### Professor of Practice

**WILLIAM D. BELLAMY**, B.S. University of Wyoming 1972; M.S. 1974; Ph.D. Colorado State University 1984; Professor of Practice of Civil Engineering 2013.

### Academic Professionals:

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**RYAN KOBBE**, B.S. University of Wyoming 2003; M.S. Washington State University 2005; Academic Professional in Architectural Engineering 2011.

**MARK D. REHWALDT**, B.S. University of North Dakota 1977; M.E. 1980; Academic Professional in Civil Engineering 2009.

### Adjunct Faculty:

Song Jin, James Kladianos, Patrick McManus, Marcie Miller

### Professors Emeriti:

Leonard B. Baldwin, Jr., Arthur P. Boresi, Robert L. Champlin, Charles W. Dolan, Thomas V. Edgar, K. James Fornstrom, David H. Foster, Victor R. Hasfurther, Michael Humenick, Don Lamb, Anton Munari, Larry O. Pochop, Paul Rechard, Richard J. Schmidt, James L. Smith, John P. Turner, Eugene M. Wilson

## Civil Engineering

The mission of the Department of Civil and Architectural Engineering at the University of Wyoming is to:

1. Educate civil and architectural engineers to design, build, operate and manage sustainable human habitat and infrastructure systems for Wyoming and the world.

2. Develop the technical solutions to support sustainable human habitat and infrastructure systems through research, innovation, application, design, and technology transfer.

The civil engineering curriculum begins with a basic education in the physical, engineering, mathematical and computer sciences. This foundation supports further development of engineering topics that prepare the engineer to address critical societal needs. To meet these needs, the civil engineer designs and builds bridges, buildings, dams and hydraulic structures, pipelines and canals, power plants, transportation facilities, sanitary and environmental engineering facilities, surveying and mapping systems, space and ocean platforms, as well as numerous other engineering systems. The civil engineer must also be aware of the social, humanistic, and political aspects of their projects. Therefore, course work in the humanities and social sciences is required to better understand the social aspects of public works. During the last two years of their program, students may pursue several areas of civil engineering or, depending upon their interests, more specialized courses in one or more of the specific technical areas listed below. All students must have a comprehensive design experience.

Civil engineering degree candidates must meet the academic requirements of the college and in addition must have an average GPA of 2.0 (C) in civil and architectural engineering courses attempted at this university.

**Structural engineering:** Analysis and design of structural systems including buildings, bridges, towers and other structures. Structural engineering also includes the study of solid mechanics and advanced structural materials.

**Environmental engineering:** Analysis, design and development of engineering systems to provide potable water supplies, treat municipal, industrial and hazardous wastes and protect human health and the environment.

**Water resource engineering:** Planning, analysis and design of hydraulic and hydrologic systems with respect to watersheds, municipalities, irrigation and drainage, and flood control. Conservation and management of groundwater and surface water are emphasized.

**Transportation engineering:** Planning, analysis and design of highways, traffic engineering and control, traffic safety, and pavement maintenance, design and rehabilitation.

**Geotechnical engineering:** Design and analysis of foundations, dams, embankments, slope stability and construction practices in soil and rock.

The civil engineering curriculum prepares the graduate to engage in professional practice, and upon completion of post-graduate requirements, to obtain registration as a Professional Engineer. It also provides the graduate with an excellent preparation for graduate studies in engineering, business or law.

**International Engineering Option**

Engineering is a global profession and today's engineers must be able to work and interact in a variety of diverse cultural and technical environments. The international engineering option gives civil engineering students an opportunity to study culture and foreign language at the same time as they pursue their engineering degrees.

The option includes at least one semester of study abroad with courses taken in a foreign language. In addition, students may participate in a four-to-five month international internship. Foreign language skills can be earned through a variety of means, including formal university coursework, intensive summer language programs, and previous education.

Foreign language education and the study-abroad experience satisfy the cultural context requirements of the University Studies Program.

**CE Objectives**

Three to six years after graduation, graduates of the University of Wyoming Civil Engineering Program will:

- CE-OB1 Be able to successfully practice the profession of Civil Engineering.
- CE-OB2 Be prepared and motivated to accept challenging assignments and responsibilities.
- CE-OB3 Demonstrate successful career growth.

**CE Outcomes**

University of Wyoming Civil Engineering graduates shall:

- CE-OT01 Solve problems in mathematics (through differential equations), in calculus-based physics, chemistry, and one additional area of science, and in engineering science.
- CE-OT02 Design or select a civil engineering laboratory test to meet a need; conduct the test, and analyze and interpret the results.
- CE-OT03 Design a complex system or process to meet desired needs within constraints such as economic, environmental, social, political, ethical, health and safety, constructability, and sustainability.
- CE-OT04 Function effectively as a member of a multi-disciplinary team.
- CE-OT05 Solve well-defined engineering problems in four technical areas in Civil Engineering.
- CE-OT06 Analyze a complex situation involving conflicting professional and ethical interests, to determine an appropriate course of action.
- CE-OT07 Develop and deliver effective verbal, written, and graphical communications.
- CE-OT08 Based on a broad education, determine the global, economic, environmental and societal impacts of a specific, relatively constrained engineering solution.
- CE-OT09 Demonstrate the ability to learn independently, without the aid of formal instruction.
- CE-OT10 Incorporate contemporary issues into the identification, formulation, and solution of engineering problems.
- CE-OT11 Apply relevant techniques, skills, and engineering tools to solve problems.
- CE-OT12 Explain key concepts and problem-solving processes used in management.
- CE-OT13 Explain key concepts and problem-solving processes used in business, public policy, and public administration.
- CE-OT14 Explain the role of the leader, leadership principles, and attitudes conducive to effective professional practice of civil engineers.

**Civil Engineering Curriculum<sup>2</sup>**

*Suggested Course Sequence*

<b>FRESHMAN YEAR: Fall</b>		<b>Hrs.</b>
MATH 2200 [Q]	.....	4
CHEM 1020 [PN]	.....	4
First-Year Seminar [FYS]	.....	3
ENGL 1010 [COM1]	.....	3
CE 1000 <sup>3</sup>	.....	2
<b>Total Hrs.</b>		<b>16</b>

<b>FRESHMAN YEAR: Spring</b>		<b>Hrs.</b>
MATH 2205	.....	4
COJO 2010 [COM2]	.....	3
US and WY Constitutions [V]	.....	3
CE 1010 <sup>3</sup>	.....	3
ES 2110	.....	3
<b>Total Hrs.</b>		<b>16</b>

<b>SOPHOMORE YEAR: Fall</b>		<b>Hrs.</b>
MATH 2210	.....	4
ES 2120	.....	3
ES 2410	.....	3
CE 2070	.....	3
CE 2000 <sup>3</sup>	.....	3
<b>Total Hrs.</b>		<b>16</b>

<b>SOPHOMORE YEAR: Spring</b>		<b>Hrs.</b>
MATH 2310	.....	3
PHYS 1220 [PN]	.....	4
ES 2310	.....	3
ES 2330	.....	3
STAT 2050	.....	4
<b>Total Hrs.</b>		<b>17</b>

<b>JUNIOR YEAR: Fall</b>		<b>Hrs.</b>
Science Elective <sup>1</sup>	.....	3
CE 3200	.....	3
CE 3210	.....	3
CE 3300	.....	3
CE 3000 <sup>3</sup>	.....	3
USP 2015 [H]	.....	3
<b>Total Hrs.</b>		<b>18</b>

<b>JUNIOR YEAR: Spring</b>		<b>Hrs.</b>
CE 3400	.....	3
CE 3500	.....	3
CE 3600	.....	3
CE 3010 <sup>3</sup>	.....	3
USP 2015 [H]	.....	3
<b>Total Hrs.</b>		<b>15</b>

<b>SENIOR YEAR: Fall</b>		<b>Hrs.</b>
CE 4250 or CE 4260	.....	3
Math/Science elective <sup>1</sup>	.....	3
Professional development electives <sup>1</sup>	.....	6
CE 4020 <sup>3</sup> , 4030 <sup>3</sup> , 4040 <sup>3</sup> , 4050 <sup>3</sup> , 4060 <sup>3</sup> or 4070 <sup>3</sup> [COM3]	.....	4
<b>Total Hrs.</b>		<b>16</b>



<b>SENIOR YEAR: Spring</b>		<b>Hrs.</b>
Math/Science/Technical electives <sup>1</sup>	.....	9
Professional development electives <sup>1</sup>	.....	6
<b>Total Hrs.</b>		<b>15</b>

<sup>1</sup>To be selected from appropriate department-approved lists.

<sup>2</sup>All civil and architectural engineering classes require a grade of C or better (GPA 2.00) in prerequisite courses.

<sup>3</sup>Course under development. See department website at [www.uwyo.edu/civil/](http://www.uwyo.edu/civil/) for more information.

### International Engineering Option Curriculum

<b>FRESHMAN YEAR: Fall</b>		<b>Hrs.</b>
MATH 2200 [Q]	.....	4
CHEM 1020 [PN]	.....	4
First-Year Seminar [FYS]	.....	3
ENGL 1010 [COM1]	.....	3
CE 1000 <sup>3</sup>	.....	2
<b>Total Hrs.</b>		<b>16</b>

<b>FRESHMAN YEAR: Spring</b>		<b>Hrs.</b>
MATH 2250	.....	4
COJO 2010 [COM2]	.....	3
US and WY Constitutions [V]	.....	3
CE 1010 <sup>3</sup>	.....	3
ES 2110	.....	3
<b>Total Hrs.</b>		<b>16</b>

<b>SUMMER AFTER FRESHMAN YEAR</b>		<b>Hrs.</b>
First-year foreign language I	.....	4
First-year foreign language II	.....	4
<b>Total Hrs.</b>		<b>8</b>

<b>SOPHOMORE YEAR: Fall</b>		<b>Hrs.</b>
MATH 2210	.....	4
ES 2120	.....	3
CE 2070	.....	3
CE 2000 <sup>3</sup>	.....	3
Second-year foreign language I	.....	4
<b>Total Hrs.</b>		<b>17</b>

<b>SOPHOMORE YEAR: Spring</b>		<b>Hrs.</b>
MATH 2310	.....	3
ES 2310	.....	3
CE 2010 <sup>3</sup>	.....	3
ES 2410	.....	3
PHYS 1220 [PN]	.....	4
Second-year foreign language II	.....	3
<b>Total Hrs.</b>		<b>19</b>

<b>SUMMER AFTER SOPHOMORE YR</b>		<b>Hrs.</b>
Science Elective <sup>1</sup>	.....	3
ES 2330	.....	3
<b>Total Hrs.</b>		<b>6</b>

<b>JUNIOR YEAR: Study Abroad</b>		<b>Hrs.</b>
CE 3000 <sup>3</sup>	.....	3
CE 3200	.....	3
CE 3210	.....	3
CE 3300	.....	3
<b>Total Hrs.</b>		<b>12</b>

<b>JUNIOR YEAR: Internship</b>		<b>Hrs.</b>
International internship	.....	3
Math/Science elective <sup>1</sup>	.....	3
<b>Total Hrs.</b>		<b>6</b>

<b>SENIOR YEAR: Fall</b>		<b>Hrs.</b>
STAT 2050	.....	3
CE 3010 <sup>3</sup>	.....	3
CE 3400	.....	3
CE 3500	.....	3
CE 3600	.....	3
CE 4250 or CE 4260	.....	3
<b>Total Hrs.</b>		<b>18</b>

<b>SENIOR YEAR: Spring</b>		<b>Hrs.</b>
Math/Science/Tech Electives <sup>1</sup>	.....	3
Prof Development Electives <sup>1</sup>	.....	12
CE 4020 <sup>3</sup> , 4030 <sup>3</sup> , 4040 <sup>3</sup> , 4050 <sup>3</sup> , 4060 <sup>3</sup> or 4070 <sup>3</sup> [COM3]	.....	4
<b>Total Hrs.</b>		<b>19</b>

<sup>1</sup>To be selected from appropriate department-approved lists.

<sup>2</sup>All civil and architectural engineering classes require a grade of C or better (GPA 2.00) in prerequisite courses.

<sup>3</sup>Course under development. See department website at [www.uwyo.edu/civil/](http://www.uwyo.edu/civil/) for more information.

### Advanced Civil and Architectural Engineering Standing

All undergraduate students in Civil and Architectural Engineering must fulfill the Gateway Requirement prior to enrolling in any upper-division (3000-5000 level) courses taught in the College of Engineering and Applied Science.

To meet the Civil and Architectural Engineering Gateway Requirement, the student must earn a minimum of 57 Quality Points from any combination of the following seven classes or their equivalent. It is not necessary to complete all seven courses to fulfill the Gateway Requirement.

#### Gateway Courses

CHEM 1020 - General Chemistry I
PHYS 1210 - Engineering Physics I or PHYS 1220 - Engineering Physics II
MATH 2200 - Calculus I
MATH 2205 - Calculus II
ES 2110 - Statics
ES 2120 - Dynamics
ES 2410 - Mechanics of Materials

See the advising pages on the Civil and Architectural Engineering website for more information.

## Graduate Study

### Graduate Programs

An advanced degree in civil engineering is professionally and economically attractive. Advanced degrees are important for professional civil engineers in many specialized areas of civil engineering. Many consulting firms and industrial design groups require advanced knowledge gained from graduate studies. Engineers in such firms often work at the forefront of their profession. UW alumni are involved in design and construction of major projects worldwide.

An advanced degree is also required for careers in university teaching and research. A university career is highly recommended for those motivated students who are interested in becoming leaders in education and in the development of new concepts, processes and inventions.

The Department of Civil and Architectural Engineering offers programs leading to the degrees of master of science and doctor of philosophy. Areas of study in the M.S. and Ph.D. programs include: building mechanical systems engineering, environmental engineering, geotechnical engineering, structural engineering, transportation engineering, and water resources engineering. The department also offers a master of science in environmental engineering in cooperation with the Department of Chemical and Petroleum Engineering. Additional information is available from the department or from the Web page.

### Program Specific Admission Requirements

Admission is open to all students holding a bachelor's degree with at least a 3.0 GPA from an accredited engineering curriculum and a GRE combined minimum score of 291 on the quantitative and verbal reasoning, with a minimum score of 148 on the verbal reasoning.

Ph.D. applicants are reviewed with regard to stated interests, objectives and the ability of the department to provide a quality experience for the applicant.

International students must achieve a TOEFL score of 550 on the paper-based, a minimum of 76 on the internet-based or a minimum of 6.0 on the IELTS.

## MSCE Quick Start Program

The MSCE Quick Start program in Civil and Architectural Engineering (CAE) is designed to present highly qualified UW students with the opportunity to begin graduate study while they complete their bachelor of science (B.S.) degree in civil engineering or architectural engineering. These students may apply for admission to the Quick Start program during the second semester of their junior year or during their senior year.

This program allows for early planning of the graduate portion of a student's education and provides more flexibility in the number of required courses and the order in which they are taken. The more efficient and better-planned use of time should result in reduction of the time required for obtaining the master of science in civil engineering (MSCE) degree. Students who enter the Quick Start program must accept the primary responsibility for actively planning their programs of study to assure timely completion of their coursework and research programs.

The Quick Start program contains two essential elements:

Qualified students may receive provisional admission to the civil engineering graduate program prior to completing the normal application process. This provisional admission will permit students to make their long-term educational plans earlier in their studies, thus providing enhanced opportunities for course selection and involvement in research.

Students in the program may apply up to six credit hours of 5000-level courses toward both the B.S. and M.S. degree programs. By completing successfully up to six credit hours of graduate classes during their senior year, these students will have demonstrated their ability to do graduate-level coursework as undergraduates, easing their transition to the civil engineering graduate program.

For additional information and an application form, please contact the CAE graduate program coordinator at (307) 766-2390 or stop by 3074 Engineering Building.

## Program Specific Degree Requirements

### Master's Program

Areas of study in the master of science program include: building mechanical systems engineering, environmental engineering, geotechnical engineering, structural engineering, transportation engineering, and water resources engineering. The master of science

degree in each of these areas requires completion of 12 to 18 hours of engineering courses related to the particular program area.

### Plan A (thesis)

The degree of master of science, Plan A, requires a minimum of 26 hours of coursework and a minimum of 4 hours thesis research in addition to the minimum requirements set forth in this bulletin.

Early in the program, the student must submit a program of study listing coursework for approval by the departmental graduate studies committee (CEGS), and the department head.

Plan A is required of all state or contract supported graduate assistants.

### Plan B (non-thesis)

Requires a minimum of 30 hours of coursework and a Plan B paper, in addition to the minimum requirements set forth in this bulletin.

Early in the program, the student must submit a program of study listing coursework and the course number that the Plan B paper covers for approval by the CEGS and the department head.

### Doctoral Program

Areas of study in the doctor of philosophy program include: building mechanical systems engineering, environmental engineering, geotechnical engineering, structural engineering, transportation engineering, and water resources engineering.

Minimum of 56 hours of coursework beyond the baccalaureate, 44 hours of which must be 5000-level (graduate-level) courses or the equivalent, and concentrated independent research leading to an acceptable dissertation.

In addition to expertise in the specific dissertation topic, the candidate must demonstrate competence in two or more research areas that will help to insure a high-quality dissertation acceptable to the student's graduate committee.

Subject to department and university requirements, the student's coursework is arranged by consultation between the student, his or her adviser, and his or her committee, and must also be approved by the CEGS and by the department head.

Coursework is defined in a program of study that should be filed by the end of the second semester of the Ph.D. program.

At a time near the completion of formal coursework, the student is required to take and pass a preliminary examination on the Ph.D. coursework and, as a part of the examination, is required to present a written and oral dissertation proposal to his or her committee for approval.

Finally, the student must demonstrate research competence in an oral defense of the dissertation and must submit an acceptable written version of the dissertation to his or her graduate committee in a timely manner to meet deadlines. In addition, the student is to meet the minimum requirements set forth in this bulletin.

## Civil Engineering (CE)

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).**

**1000. VISTA Studio I. 2.** Introduction to civil and architectural engineering professions through exploration of modern engineering challenges. Students work on a design project, starting with problem definition and working towards concept designs using spreadsheet and communication tools. Professional topics introduced include globaliztion, diversity, professional ethics, design limitations and constraints, sustainability, environmental stewardship, and engineering economics. Cross listed with ARE 1000. *Prerequisites:* Corequisites of MATH 1450 or MATH 1405.

**1010. Civil Engineering Tools. 3.** This course is an introduction to computing tools commonly used in civil engineering practice including 3-D Computer Aided Drafting, Spreadsheets and Presentation Software. Tools will be introduced through design work on typical civil engineering design projects. *Prerequisites:* ARE 1000 or CE 1000 and corequisite of MATH 2200.

**2000. VISTA Studio II. 3.** Students work on a real-world project throughout the semester. Professional topics introduced include project management, engineering economic analysis methods, project estimating, professional ethics, engineering business practices common to the civil and architectural engineering professions, and professional leadership. Cross listed with ARE 2000. *Prerequisites:* ARE 1600 or CE 1010 and corequisite of MATH 2205.

**2070. Engineering Surveying. 3.** Principles of measurements of distances, elevation and angles. Basic error theory in measurement and calculations. Traverse field techniques and

office calculations. Basic principles of surveying and map making. *Prerequisite:* significant surveying experience or ES 1060.

**2100. Civil Engineering Systems. 3.** The practice of civil engineering is used as a model to introduce how the different areas of civil engineering are interested. Uses examples from several civil engineering projects to introduce computer-aided drafting and design. *Prerequisites:* ES 2110 and CE 2070.

**3000. VISTA Studio III. 3.** Students will apply professional skills such as project management, engineering economics, professional ethics, and sustainability to an integrated design project. The role of permitting, regulations, and professional codes to design problems will also be explored. Cross listed with ARE 3000. *Prerequisites:* ARE 2000 or CE 2000, and ES 2410.

**3010. Civil Engineering Design. 3.** Students will prepare final civil engineering documents including construction plans, specifications, and engineering estimates for a civil engineering project. Concepts of standard specifications and sustainability measures will also be applied to the design. *Prerequisites:* ARE 3000 or CE 3000, and STAT 2050.

**3100. Civil and Architectural Engineering Practice. 3.** Civil and architectural engineering practice from project inception through construction documentation. Topics include: codes, marketing, specifications, budgeting, contracts, subcontracting, registration, construction planning, scheduling, bidding, liability, insurance, and bonding. A review of professional ethics including the engineer in society, business and profession with case studies of professional responsibility and ethics decisions. Cross listed with ARE 3100. *Prerequisites:* CE 2100 or ARE 2100.

**3200. Structural Analysis I. 3. [WB♦(none)]** Introductory design and analysis topics in loads on building, stress and displacement analysis of structures, including beams, trusses and frames, classical flexibility and stiffness methods. Cross listed with ARE 3200. *Prerequisite:* ES 2410.

**3210 [2210]. Civil Engineering Materials. 3. [WB♦(none)]** Laboratory investigation and design of materials used in civil engineering: metals, masonry, concrete and timber. Non-destructive evaluation of materials. Analysis and presentation of data, including various types of written reports and oral presentations. Cross listed with ARE 3210. *Prerequisites:* WA and ES 2410.

**3300 [4320]. Hydraulic Engineering. 3.** Develops analysis, design and modeling techniques for incompressible pipe flow, steady uniform and gradually varied open channel flow, and hydraulic structures. *Prerequisite:* ES 2330.

**3400. Introduction to Environmental Engineering. 3.** An introduction to the major topics in environmental engineering. Focus areas include water supply, wastewater treatment, air pollution control and solid and hazardous waste management. Quantitative aspects and engineering solutions to problems are emphasized. *Prerequisites:* MATH 2205 and CHEM 1020 or equivalent.

**3500 [4500]. Transportation Engineering. 3.** Introduction to the major topics in Transportation Engineering. Focus areas include roadway and non-motorized facility design, traffic operations, transportation planning, and pavement materials and design. *Prerequisite:* CE 2070.

**3600 [4600]. Soil Mechanics I. 3.** A study of soil and the properties which influence its usefulness as an engineering material. Principles governing movement of soil, water and propagation of stresses through soil masses are studied. *Prerequisite:* ES 2410.

**3900 [4900]. Engineering Economics and Decision Making. 3.** A study of decision making with an emphasis on economic criteria. Includes time value of money, present value, annual value and rate of return methods; incremental graphics, depreciation methods, income tax evaluations; replacement and sensitivity analysis; and governmental financing. Evaluation of risk and uncertainty in decision making also covered. *Prerequisite:* junior standing.

**4100. Civil Engineering Applications in GIS. 3.** Concepts of Geographic Information Systems, the methods and software used to implement them, and their applications to solve civil engineering problems. *Prerequisites:* CE 2070 and senior standing.

**4200. Structural Analysis II. 3.** Stress and displacement of indeterminate structures. Determination of loads on buildings. Matrix stiffness methods. Cross listed with ARE 4200. *Prerequisite:* ARE/CE 3200.

**4250. Structural Steel Design. 3.** Design of structural components and applications utilizing steel. Cross listed with ARE 4250. *Prerequisite:* ARE/CE 4200 or concurrent enrollment.

**4260. Structural Concrete Design. 3.** Design of structural components and applications utilizing reinforced concrete. Cross listed with ARE 4260. *Prerequisite:* ARE/CE 3200.

**4280. Reinforced Masonry Design. 3.** Design of structural components in reinforced masonry buildings, including walls, columns,

beams and connections. Particular attention is paid to current codes, specifications and analysis. Cross listed with ARE 4280. *Prerequisites:* ARE/CE 4260 and concurrent enrollment in ARE/CE 4200.

**4295 [4290]. Structural Timber Design. 3.** Design of structural components and applications utilizing timber. Cross listed with ARE 4295. Dual listed with CE 5295. *Prerequisite:* CE 3200 or equivalent.

**4350 [4810]. Design of Hydraulic Engineering Systems. 3.** For seniors and graduate students in civil engineering who desire to learn design of municipal water distribution and wastewater collection (storm and sanitary) systems by combining principles from hydraulics, hydrology and environmental engineering course work into an integrated design approach. *Prerequisite:* CE 3300.

**4400. Design of Water Treatment Facilities. 3.** A theoretical and practical design course for municipal potable water treatment systems. Major emphasis includes health criteria, operational control procedures, primary and secondary drinking water regulations, as well as the latest treatment design standards for production of drinking water. *Prerequisite:* CE 3400.

**4410. Design of Wastewater Treatment Facilities. 3.** A theoretical and practical design course for treatment of municipal wastewaters. Major areas of emphasis include waste characterization and physical, chemical and biological unit processes. *Prerequisite:* CE 3400.

**4430 [3420, 2420]. Environmental Engineering Chemistry. 3.** Focus includes inorganic, organic, physical, equilibrium, biochemistry, colloidal, and nuclear chemistry with an emphasis on the problems/solutions encountered by environmental and civil engineers. *Prerequisite:* CE 3400.

**4441 [4440]. Solid Waste Engineering. 3.** Municipal solid waste characteristics and quantities, collection, landfills, processing of municipal solid waste, materials separation, combustion and energy recovery, and biochemical processes with an emphasis on materials flow. Integrated solid waste management principles are also discussed. Dual listed with CE 5441. Cross listed with ENVE 5441. *Prerequisites:* CHEM 1020 and CE 3400.

**4510 [5510]. Pavement Design for Airports and Highways. 3.** Designing flexible and rigid pavements for highways and airports. Topics include pavement materials and common uses, soil stabilization, quality control of materials, pavement design procedures. Dual listed with CE 5510. *Prerequisite:* CE 3500 or 3600.

**4530. Traffic Engineering: Operations. 3.**

Basic characteristics of traffic, such as drivers, vehicles, volumes, speeds, delay, origins and destinations, intersection performance, capacity, termination and accidents; techniques for making traffic engineering investigations; traffic laws and ordinances, regulations, design and application of signal systems; curb parking control; enforcement and traffic administration; and public relations. Dual listed with CE 5530. Prerequisite: CE 3500.

**4555 [4520]. Geometric Design of Highways. 3.** Criteria controlling geometric design of highways including design speed, design volume, vehicle requirements and capacity design standards for different highway types; design of sight distance, alignment, grade; cross-section design; access control, frontage roads; intersection design elements, and design of intersections and interchanges. Students may not receive credit for both CE 4555 and CE 5555. Dual listed with CE 5555. Prerequisite: CE 3500.

**4610 [5610]. Foundation Engineering. 3.** Site characterization and soil properties. Includes bearing capacity, stress distribution, settlement. Design of shallow and deep foundations. Prerequisite: CE 3600.

**4620. Soil and Rock Slope Engineering. 3.** Covers the topic of engineered slopes for civil infrastructure. Topics include engineering and geologic classification of landslides; field investigations; soil and rock strength properties for stability analysis; analytical and numerical methods for analysis of slope stability; design of engineered stabilization systems. Prerequisite: CE 3600.

**4630. Geotechnical Engineering. 3.** Covers topics in design and analysis of soil site investigation and construction, such as instrumentation, soil improvement, water control and remedial measures. Prerequisite: CE 3600.

**4800. Hydrology. 3.** Analysis of elements of the hydrologic cycle and design with emphasis on precipitation, evapotranspiration, infiltration, runoff and groundwater. Precipitation/Runoff relationships, routing methods, flood prediction, groundwater yield and drawdown in unconfined and confined aquifers, unsteady well behavior, and method of images are also introduced. Prerequisite: CE 3300.

**4820 [AGRE 4200]. Groundwater and Drainage Engineering. 3.** Principles and basic equations associated with saturated and unsaturated flow in soils describing groundwater and drainage flow will be developed. Design and analysis of surface and subsurface drainage systems will occur for steady and transient flow. Prerequisite: ES 2330.

**4900. Comprehensive Design Experience in:\_\_\_\_\_.** 1-4 (Max. 4). Concentrated, comprehensive design course focusing on one or more subdisciplines within civil engineering. See your departmental adviser for further information and requirements. Prerequisite: senior standing in civil engineering; concurrent enrollment in the designated companion course.

**4920. Senior Civil Engineering Problems. 1-3 (Max. 6).** A study of current engineering problems that are applicable to civil engineering either on an individual basis or for small seminar type groups. Prerequisite: senior standing or approval of department head.

**4959. Enrichment Studies. 1-4 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may NOT be included in an undergraduate or graduate program of study for a degree or for credit towards a certificate program. Prerequisite: consent of instructor.

**4970. Wyoming D.O.T. Design Squad Cooperative Experience. 3.** Experience with Wyoming Department of Transportation design procedures and fundamentals. Participation in development of design documents used to construct actual projects. Offered S/U Only. Prerequisite: selection for Laramie Design Squad employment and consent of department head.

**4975. Civil and Architectural Engineering Internship. 1-3 (Max. 3).** Students may apply for credit for extended work experience (>10 weeks; full-time) at a professional engineering or architectural firm, supervised by a licensed professional. Students should apply through their adviser prior to the work experience. Enrollment is by departmental approval only. Offered summer only. Prerequisite: junior standing.

**5000. Solid Mechanics I. 3.** The first in a sequence of two introductory courses in solids mechanics. It includes elements of continuum mechanics, in addition to the introduction of elasticity theory (limited to plane problems), as well as elements of viscoelasticity and plasticity. Cross listed with ME 5000. Prerequisite: CE 3200 or ME 3010 and MATH 2310.

**5010. Advanced Mechanics of Materials. 3.** Elements of elasticity, unified approach to strength of structural members design and failure criteria; basic concepts of fracture mechanics; stress concentration factors; treatment of torsion, bending, axial and shear in structural members including plastic effects; bending of flat plates. Prerequisite: ME 3010 or CE 3200, MATH 2310.

**5040 [5020]. Introduction to Finite Element Analysis. 3.** An introduction to the theory and application of finite elements to the solu-

tion of various problems with emphasis on structural mechanics. Includes development of the underlying matrix equations, the treatment of element generation and properties, and implementation of boundary conditions. Cross listed with ME 5040. Prerequisite: MATH 2310 and (CE 4200 or ARE 4200 or ME 3010).

**5045. Advanced Finite Element Analysis. 3.** Advanced topics in finite element analysis with emphasis on mathematical foundations of the method, numerical algorithms for software implementation, and analysis of problems with material and geometric nonlinear behavior. Cross listed with ME 5045. Prerequisite: ME 4040 or ME 5040 or CE 5040.

**5140. Computational Methods in Applied Sciences I. 3.** First semester of a three-semester computational methods series. Review of iterative solutions of linear and nonlinear systems of equations, polynomial interpolation/approximation, numerical integration and differentiation, and basic ideas of Monte Carlo methods. Comparison of numerical techniques for programming time and space requirements, as well as convergence and stability. Identical to ME 5140, PETE 5140, CHE 5140, COSC 5310 and MATH 5310. Prerequisite: MATH 3310, COSC 1010.

**5200. Advanced Structural Analysis. 3.** Analysis of framed structures with stiffness-based matrix methods including plane trusses, frames, and grid systems and space trusses and frames. Column, beam, beam-column and frame stability. Geometric and material nonlinearities of framed structures. Plastic analysis and moment-curvature relationships. Computer applications are emphasized. Prerequisite: CE 4200 or equivalent.

**5220. Structural Dynamics. 3.** Introduction to general structural dynamics, general dynamic loading, generalized coordinated and nonlinear structural response, linear and nonlinear response spectra, multiple degree of freedom systems, continuous systems, and discretization of continuous systems. Introduction to seismic load specifications. Prerequisite: CE 4200 or equivalent and MATH 2310.

**5230. Advanced Materials. 3.** The objective of this course is to introduce the graduate student to the behavior of various materials found in typical structural engineering applications and to the mechanics of obtaining materials properties and structural response. Prerequisite: CE 4260.

**5240. Structural Systems Design. 1-5 (Max. 6).** A comprehensive design course for steel and reinforced concrete building structures. Topics include preliminary design, selection of framing systems, braced and unbraced

frames, stability effects and nonlinear behavior. Students use case studies to develop design alternatives. *Prerequisite:* CE 4200, 4250, 4260.

**5255. Advanced Steel Design 3.** A comprehensive design course for steel building structures. Topics include preliminary design, selection of framing systems, braced and unbraced frames, stability effects and nonlinear behavior. Includes building design project for seismic regions. *Prerequisites:* grade of C or better in CE or ARE 4250.

**5260. Prestressed Concrete Design. 3.** This is a classical course on prestressed and precast concrete. The subject focuses on the principles, behavior and performance of prestressed and precast concrete. Topics include flexure, shear, and axial load, construction and fabrication issues, and applications. The course complements CE 4260. *Prerequisite:* CE 4260.

**5270. Highway Bridge Engineering. 3.** A study of the analysis, design and rating of highway bridges, including consideration of dead and vehicular loads, analysis of typical systems, service, fatigue and ultimate strength behavior, rating of existing bridge design, and bridge operations. Composite and non-composite steel and concrete bridges are considered. Includes investigations that require field trips outside the schedule class times. Contemporary issues are routinely discussed. *Prerequisites:* CE 4250 and 4260.

**5280. Behavior of Reinforced Concrete. 3.** Broad-based coverage of the behavior of concrete, both at the member and structure level. The course will have no assigned text, although students will be expected to have an undergraduate concrete design textbook and a current ACI Code. Readings will include a number of technical papers in each area covered. Emphasis will be on the background of the code, code development, and investigative techniques. *Prerequisite:* CE 4200 and 4260.

**5290. Earthquake Engineering. 3.** Second course in a series to design earthquake resistant structures. Topics include interpreting code requirements, calculating design forces on structures, evaluating inelastic behavior of structures, understanding how materials behave and advances in earthquake engineering. *Prerequisite:* CE 5220.

**5295. Structural Timber Design. 3.** Design of structural components and applications utilizing timber. Cross listed with ARE 5295. Dual listed with CE 4295. *Prerequisite:* CE 3200 or equivalent.

**5300. Open-Channel Hydraulics. 3.** Analysis and design of steady, uniform, gradually varied and spatially varied flow in open chan-

nels. Emphasis on basic fluid flow equations associated with natural and man-made open channels. *Prerequisite:* CE 3300.

**5310. Hydraulics of Closed Conduits. 3.** Pipe transmission and distribution systems design including flow control, flow measurement, energy dissipation, pump selection, transients, and cavitation. *Prerequisite:* CE 3300.

**5330. Design of Hydraulic Structures. 3.** Basic hydraulic principles and design of man-made channels. Analysis and design of control and regulating devices and measurement devices used in water resources systems. *Prerequisite:* CE 3300.

**5400. Water Treatment. 3.** Advanced theory and practice of collection, purification, and distribution of potable water; special emphasis on purification techniques, and plant requirements and design. *Prerequisite:* CE 4400.

**5410. Advanced Biological Wastewater Treatment. 3.** Theory and practice of advanced biological treatment processes for municipal and industrial wastewaters, sludges, groundwater bioremediation and solid waste. Emphasis is on fundamental principles applied to the design and control of existing processes and the development of innovative systems. Cross listed with CHE/ENVE 5410. *Prerequisites:* consent of instructor.

**5425. Environmental Engineering Microbiology. 3.** Focuses on microbial processes of interest in environmental engineering applications, including microbial corrosion; acid mine drainage; biogenic greenhouse gas emissions; biogeochemical cycling of nitrogen, phosphorus, and sulfur; microbial transformations involving iron and other metals/metalloids; anaerobic processes and syntrophic associations; methane oxidation; environmental transmission of pathogens; remediation of hazardous materials. Cross listed with ENVE 5425. *Prerequisite:* graduate standing.

**5435. Environmental Transport Processes. 3.** Designed for graduate students and engineering seniors interested in the principles of mass transport and their application to environmental systems. Deals with the hydrodynamics of mixing and transport, as well as the interaction of mixing and various reaction rate processes. Applications include water and wastewater treatment, groundwater pollution, and transport and mixing in rivers, lakes and reservoirs. *Prerequisite:* MATH 2310 and ES 2330.

**5441. Solid Waste Engineering. 3.** Municipal solid waste characteristics and quantities, collection, landfills, processing of municipal solid waste, materials separation, combustion and energy recovery, and biochemical processes with an emphasis on materials flow. Integrated

solid waste management principles are also discussed. Dual listed with CE 4441. Cross listed with ENVE 5441. *Prerequisite:* graduate standing.

**5445. Hazardous Waste Site Remediation. 3.** The contamination of soil, air, and groundwater by improper disposal of hazardous wastes is covered. Control and cleanup of contaminated groundwater plumes, treatment of polluted soils and soil gases is emphasized. Case studies are extensively used. Cross listed with ENVE 5445. *Prerequisite:* CE 3400.

**5450. Advanced Physical-Chemical Treatment. 3.** A study of physical and chemical processes for treatment of water and waste water. Cross listed with ENVE 5450. *Prerequisite:* CE 4400.

**5455. Project Management for Environmental Engineering. 3.** Covers the fundamentals of project management as applied to the environmental remediation field. Emphasis will be placed on project organization, work breakdown structures, life cycle management project implementation and control, and the integration of individual projects into the overall project management framework. *Prerequisite:* CE 3400.

**5460. Industrial Waste Treatment. 3.** A critical study of the sources and treatment of various industrial wastewaters is covered, including the regulatory framework establishing treatment goals. Case studies of various industries are used to illustrate methods of volume and strength reduction. Design of unit operations and processes peculiar to industrial waste treatment is emphasized. *Prerequisite:* CE 5410.

**5510. Pavement Design for Airports and Highways. 3.** Designing flexible and rigid pavements for highways and airports. Topics include pavement materials and common uses, soil stabilization, quality control of materials and pavement design procedures. Dual listed with CE 4510. *Prerequisite:* CE 3500 or 3600.

**5530 [5520]. Traffic Engineering: Operations. 3.** Basic characteristics of traffic, such as drivers, vehicles, volumes, speeds, delay, origins and destinations, intersection performance, capacity, termination and accidents; techniques for making traffic engineering investigations; traffic laws and ordinances, regulations, design and application of signal systems; curb parking control; enforcement and traffic administration; and public relations. Dual listed with CE 4530. *Prerequisite:* CE 3500.

**5535. Engineering Decision Making. 3.** A study of engineering decision-making techniques based on monetary and non-monetary criteria. Includes benefit-cost analysis, sufficiency ratings and sensitivity and risk analysis; mathematical programming and optimization

models; multi-attribute and multi-objective decision-making methods; and management systems. *Prerequisite:* CE 3900.

**5540. Traffic Control. 3.** Planning, designing, and operating transportation facilities to optimum efficiency using traffic control devices. Topics included are traffic flow theory; pavement markings, signing, and signal design; computer design of signal systems using linear and network models; traffic control in construction areas. *Prerequisite:* CE 3500 and ES 2110.

**5545. Transport Network Analysis. 3.** Traffic assignment and network modeling techniques; deterministic and stochastic user equilibrium assignment; mathematical programming formulations and solution algorithms; extensions to basic models; and applications to roadway pricing and other planning scenarios. *Prerequisite:* graduate standing in civil engineering.

**5555. Geometric Design of Highways. 3.** Criteria controlling geometric design of highways including design speed, design volume, vehicle requirements and capacity design standards for different highway types; design of sight distance, alignment, grade; cross-section design; access control, frontage roads; intersection design elements; and design of intersections and interchanges. CE 5555 students are required to do an additional integrated design term project using design software. Students may not receive credit for both CE 4555 and CE 5555. Dual listed with CE 4555. *Prerequisites:* CE 3500.

**5560. Traffic Safety. 3.** Safety design and operational practices for streets and highways including safety improvement programs, design of barrier systems, bicycle and pedestrian consideration; access control; safety evaluation; and measures of effectiveness. *Prerequisite:* CE 3500 and STAT 4220.

**5570. Transportation Planning. 3.** Short and long-range transportation planning; land-use planning, travel behavior and transportation studies including demand forecasting; parking and transit studies; highway and street planning; and freight transportation and multi-model planning. *Prerequisite:* CE 3500.

**5575. Intelligent Transportation Systems. 3.** The use of Intelligent Transportation Systems (ITS) to improve the safety, efficiency, reliability, and/or security of transportation systems. Covers ITS applications, technologies, deployment issues, and system performance in both urban and rural environments. *Prerequisites:* CE 3500.

**5585. Pavement Management Systems. 3.** A study of the systems that a transportation agency may utilize to manage the pavement

in their road network. History and purpose of pavement management are studied as well as how to make objective pavement management decisions. The distinction between project-level and network-level management concerns is explored and the implementation of a pavement management system is studied. Finally, methods for utilizing the information from the management system is studied. *Prerequisite:* CE 3500.

**5590. Pavement Materials. 3.** Selecting materials for highway construction, testing aggregates and bituminous materials, designing and testing asphalt mixtures; and recommending maintenance and rehabilitation strategies for deteriorated pavements. *Prerequisite:* CE 3500.

**5620. Earth Retaining Structures and Slope Stability. 3.** Earth pressure theories. Design of rigid and flexible earth retaining walls and braced excavations. Analysis, design, and control of natural and man-made slopes. *Prerequisite:* CE 3600.

**5700. Civil Engineering Problems I. 1-3 (Max. 6).** A special course, designed to make possible the study and investigation of problems or phases of civil engineering selected to fit the needs of the students. *Prerequisite:* consent of instructor.

**5710. Civil Engineering Seminar I. 1-3 (Max. 6).** A seminar type class furnishing motivation for advanced study of current problems in broad field of civil engineering by means of library research, study of current literature, and carefully guided class discussion. *Prerequisite:* consent of instructor.

**5720. Civil Engineering Problems II. 1-3 (Max. 6).** A special course designed to make possible the study and investigation of problems or phases of civil engineering selected to fit the needs of the student. *Prerequisite:* consent of instructor.

**5730. Civil Engineering Seminar II. 1-3 (Max. 6).** A seminar-type class furnishing motivation for advanced study of current problems in the broad field of engineering by means of library research, study of current literature, and carefully guided class discussions. *Prerequisite:* consent of instructor.

**5785. H.T. Person Seminar. 3.** Special topics in engineering as presented by the H.T. Person distinguished professor. *Prerequisite:* graduate standing.

**5810. Groundwater Hydrology. 3.** Laws governing the movement, recharge, and production of underground water with special emphasis on techniques and methods for analysis and modeling for development of groundwater resources. *Prerequisite:* CE 4800.

**5820. Design of Small Earth Dams. 3.** Develop understanding, analysis, design and construction techniques for all components considered in small earth dam design. Integration of hydrology, hydraulics and soil mechanics into a sound dam design. Dam design will be emphasized from foundation through embankment. *Prerequisite:* CE 3300, 3600 and 4800 or concurrent enrollment.

**5830. Flow in Porous Media. 3.** Examines fluid (liquid, gas, vapor) and heat flow in porous media and its effects specifically in soil. Near surface effects (impaction, infiltration and evaporation) is emphasized. Analytic and numerical solution techniques will be developed. *Prerequisite:* CE 5810 or consent of instructor.

**5860. Soil Erosion and Conservation. 3.** Physical principles of soil erosion by wind and water, computer simulations of erosion, selection and design of erosion control practices and structures. *Prerequisite:* CE 4300, CE 4800.

**5865. Deterministic Hydrology. 3.** Philosophy of modeling, hydrologic model formulation and design; lumped, semi-distributed, and physics-based hydrologic models for watershed- and landscape-scale predictions; process-level mathematical and numerical descriptions and coupling; model calibration, testing, and validation; parameterization, numerical approximations of flow equations; scale effects, modeling ethics. *Prerequisite:* CE 4800.

**5870. Water Resources Engineering. 3.** Study in water resource planning and design and problem solving applying engineering principles and procedures. Western United States water problems are emphasized, including user completion, reallocation, consumptive use, water development, conservation, conveyance losses, and return flows. *Prerequisite:* CE 3300.

**5875. Probabilistic Hydrology. 3.** Introduction to the language, methods and tools in systems analysis in stochastic hydrologic modeling; parameter estimation; sensitivity analysis; optimization schemes; uncertainty analysis; probabilistic forecasting; state-space modeling with Kalman filtering, and data assimilation. *Prerequisite:* CE 4800.

**5880. Advanced Hydrology. 3.** Advanced hydrologic analysis of floods, sediment, water utilization, flow routing, and the application of special hydrologic problems. *Prerequisite:* CE 3300 and CE 4800.

**5885. Hydrometeorology. 3.** Global radiation budget, global hydrologic cycle, precipitation formation, occurrence and remote sensing, snow melt, evapotranspiration, interception,

infiltration and runoff generation mechanisms, overland flow, land surface modeling, stream routing. *Prerequisite:* CE 3300.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* Enrolled in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrolled in a graduate level degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Architectural Engineering

Architectural Engineering is a rapidly expanding profession that deals with the myriad aspects of buildings and their design, construction and operation. Architectural engineers are typically specialists, responsible for the design and integration of such building elements as the structural, plumbing, fire protection, heating and air conditioning, or lighting and electrical systems. The curriculum in architectural engineering is designed to acquaint students with the various aspects of building design and construction and exposes them to a variety of courses dealing with different building materials and systems. The curriculum also includes course work in the humanities and social sciences, both to enrich the student's academic experience and assist in dealing with and contributing to society. The program leads to a Bachelor of Science in Architectural Engineering, preparing graduates to engage

in practice as Professional Engineers upon completion of post-graduate registration requirements. Graduate work with emphasis in Architectural Engineering leading to a Master of Science and Doctor of Philosophy degree is offered through the Civil and Mechanical Engineering Programs. Additionally, advanced study can also be pursued in allied areas such as architecture, business or other engineering fields.

Students choose an area of emphasis in either structural or mechanical systems and select courses from approved electives, usually beginning their elective sequence in the second semester of their junior year. Consult with the Civil and Architectural Engineering Department for current elective lists.

Architectural engineering degree candidates must meet the academic requirements of the college and in addition must have an average GPA of 2.0 (C) in civil and architectural engineering courses attempted at this university.

## Architectural Engineering Objectives

Three to six years after graduation, graduates of the University of Wyoming Civil Engineering Program will:

ARE-OB1 Be able to successfully practice the profession of Architectural Engineering.

ARE-OB2 Be prepared and motivated to accept challenging assignments and responsibilities.

ARE-OB3 Demonstrate successful career growth.

## ARE Outcomes

University of Wyoming Architectural Engineering graduates shall:

ARE-OT01 Solve problems in mathematics (through differential equations), in probability and statistics, in calculus-based physics and general chemistry, and in engineering science.

ARE-OT02 Design or select an engineering laboratory test to meet a need; conduct the test, and analyze and interpret the results.

ARE-OT03 Design a complex system or process to meet desired needs within constraints such as economic, environmental, social, political, ethical, health and safety, constructability, and sustainability.

ARE-OT04 Function effectively as a member of a multi-disciplinary team.

ARE-OT05 Solve well-defined engineering problems in two technical areas in Architectural Engineering.

ARE-OT06 Analyze a complex situation involving conflicting professional and ethical interests, to determine an appropriate course of action.

ARE-OT07 Develop and deliver effective verbal, written, and graphical communications.

ARE-OT08 Based on a broad education, determine the global, economic, environmental and societal impacts of a specific, relatively constrained engineering solution.

ARE-OT09 Demonstrate the ability to learn independently, without the aid of formal instruction.

ARE-OT10 Incorporate contemporary issues into the identification, formulation, and solution of engineering problems.

ARE-OT11 Apply relevant techniques, skills, and engineering tools to solve problems.

ARE-OT12 Apply fundamental principles of architectural design to open-ended problems.

ARE-OT13 Demonstrate an understanding of key concepts in architectural history.

ARE-OT14 Be able to communicate and interact with design professionals in the building industry.

## Architectural Engineering Curriculum<sup>1</sup>

### *Suggested Course Sequence*

*Freshman and Sophomore years are the same for both the Structural and Mechanical options.*

<b>FRESHMAN YEAR: Fall</b>		<b>Hrs.</b>
MATH	2200 [Q]	4
CHEM	1020 [PN]	4
	First-Year Seminar [FYS]	3
ENGL	1010 [COM1]	3
ARE	1000 <sup>2</sup>	2
<b>Total Hrs.</b>		<b>16</b>

<b>FRESHMAN YEAR: Spring</b>		<b>Hrs.</b>
MATH	2205 [Q]	4
PHYS	1210 [PN]	4
ES	2110	3
COJO	2010 [COM2]	3
ARE	1600 <sup>2</sup>	3
<b>Total Hrs.</b>		<b>17</b>

<b>SOPHOMORE YEAR: Fall</b>		<b>Hrs.</b>
MATH	2210 [Q]	4
ES	2120	3
ES	2410	3
ARE	2000 <sup>2</sup>	3
ARE	2600 <sup>2</sup>	3
<b>Total Hrs.</b>		<b>16</b>

<b>SOPHOMORE YEAR: Spring</b>		<b>Hrs.</b>
STAT	2050.....	4
ES	2310.....	3
ES	2330.....	3
ARE	2410.....	3
GEOL	1100, 1500, or 1600.....	4
<b>Total Hrs.</b>		<b>17</b>

*Structural Option*

<b>JUNIOR YEAR: Fall</b>		<b>Hrs.</b>
ARE	3000 <sup>2</sup> .....	3
ART	3030 [H].....	3
ARE	3600.....	3
ARE	3200.....	3
ES	2210.....	3
CE	3600.....	3
<b>Total Hrs.</b>		<b>18</b>

**JUNIOR YEAR: Spring**

<b>Hrs.</b>		
ARE	3210.....	3
ARE	4600.....	3
ARE	3300 or 3400.....	3
ARE	4260.....	3
MATH	2310.....	3
<b>Total Hrs.</b>		<b>15</b>

<b>SENIOR YEAR: Fall</b>		<b>Hrs.</b>
ARE	4200.....	3
ARE	4250.....	3
ARE	Structural Option Elective <sup>3</sup> .....	3
US and Wyoming	Constitutions [V].....	3
Math or Science	Elective <sup>3</sup> .....	3
<b>Total Hrs.</b>		<b>15</b>

<b>SENIOR YEAR: Spring</b>		<b>Hrs.</b>
ARE	4720.....	4
ARE	Structural Option Elective <sup>3</sup> .....	3
ARE	Major Elective <sup>3</sup> .....	3
ARE	General Elective <sup>3</sup> .....	3
USP 2015 [H]	.....	3
<b>Total Hrs.</b>		<b>16</b>

*Mechanical Option*

<b>JUNIOR YEAR: Fall</b>		<b>Hrs.</b>
ART	3030 [H].....	3
ARE	3600.....	3
ARE	3000 <sup>2</sup> .....	3
ARE	3400.....	3
ES	2210.....	3
ARE	3200.....	3
<b>Total Hrs.</b>		<b>18</b>

<b>JUNIOR YEAR: Spring</b>		<b>Hrs.</b>
ARE	3210.....	3
ARE	4600.....	3
ARE	4430 or ARE 4490.....	3
ARE	3300.....	3
MATH	2310.....	3
<b>Total Hrs.</b>		<b>15</b>

<b>SENIOR YEAR: Fall</b>		<b>Hrs.</b>
ARE	Major Elective <sup>3</sup> .....	3
ARE	3360.....	3
ARE	Mechanical Option Elective <sup>3</sup> .....	3
US and WY	Constitutions [V].....	3
Math or Science	Elective.....	3
<b>Total Hrs.</b>		<b>15</b>

<b>SENIOR YEAR: Spring</b>		<b>Hrs.</b>
ARE	4740.....	4
ARE	4430 or ARE 4490.....	3
ARE	Major Elective <sup>3</sup> .....	3
USP 2015 [H]	.....	3
ARE	General Elective <sup>3</sup> .....	3
<b>Total Hrs.</b>		<b>16</b>

<sup>1</sup>All civil and architectural engineering classes require a grade of C (GPA 2.0) or better in prerequisites.

<sup>2</sup>Course under development. See department website at [www.uwyo.edu/civil/](http://www.uwyo.edu/civil/) for more information.

<sup>3</sup>To be selected from Department approved lists for elective courses. See department website at [www.uwyo.edu/civil/](http://www.uwyo.edu/civil/) for more information.

**Advanced Civil and Architectural Engineering Standing**

All undergraduate students in Civil and Architectural Engineering must fulfill the Gateway Requirement prior to enrolling in any upper-division (3000-5000 level) courses taught in the College of Engineering and Applied Science.

To meet the Civil and Architectural Engineering Gateway Requirement, the student must earn a minimum of 57 Quality Points from any combination of the following seven classes or their equivalent. It is not necessary to complete all seven courses to fulfill the Gateway Requirement.

**Gateway Courses**

- CHEM 1020 - General Chemistry I
- PHYS 1210 - Engineering Physics I  
or PHYS 1220 - Engineering Physics II
- MATH 2200 - Calculus I
- MATH 2205 - Calculus II
- ES 2110 - Statics
- ES 2120 - Dynamics
- ES 2410 - Mechanics of Materials

See the advising pages on the Civil and Architectural Engineering website for more information.

**Architectural Engineering (ARE)**

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

**1000. VISTA Studio I. 2.** Introduction to civil and architectural engineering professions through exploration of modern engineering challenges. Students work on a design project, starting with problem definition and working towards concept designs using spreadsheet and communication tools. Professional topics introduced include globaliztion, diversity, professional ethics, design limitations and constraints, sustainability, environmental stewardship, and engineering economics. Cross listed with CE 1000. *Prerequisites:* Corequisites of MATH 1450 or MATH 1405.

**1600 [2100]. Architectural Design Studio I. 3.** Freshman-level architectural design in a project-based learning environment. Introduction to Building Information Modeling (BIM); architectural presentation drawings; freehand sketching; essentials of architectural design and building code compliance. *Prerequisite:* MATH 1450 or MATH 1405.

**2000. VISTA Studio II. 3.** Students work on a real-world project throughout the semester. Professional topics introduced include project management, engineering economic analysis methods, project estimating, professional ethics, engineering business practices common to the civil and architectural engineering professions, and professional leadership. Cross listed with CE 2000. *Prerequisites:* ARE 1600 or CE 1010 and corequisite of MATH 2205.

**2410. Fundamentals of Building Performance. 3.** Introduction to building performance measures that embrace a global notion of environmental stewardship. Emphasis on passive heating and cooling systems and daylighting strategies to manage the thermal and luminous environments over the facility life cycle. *Prerequisite:* PHYS 1210.

**2600 [2200]. Architectural Design Studio II. 3.** Sophomore-level architectural design in a project-based learning environment using Building Information Modeling (BIM). The course builds upon skills learned in ARE 1600, with a new emphasis on building materials and constructions methods. *Prerequisite:* ARE 1600.

**3000. VISTA Studio III. 3.** Students will apply professional skills such as project management, engineering economics, professional ethics, and sustainability to an integrated design project. The role of permitting, regulations, and professional codes to design



problems will also be explored. Cross listed with CE 3000. *Prerequisites:* ARE 2000 or CE 2000, and ES 2410.

**3030. History of Architecture. 3. [CH,G◀▶(none)]** A survey of the history of architecture and its allied fields, focusing on the formal, aesthetic, cultural and socio-political dimensions, from prehistory to the present. *Prerequisites:* WA.

**3100. Civil and Architectural Engineering Practice. 3.** Civil and architectural engineering practice from project inception through construction documentation. Topics include: codes, marketing, specifications, budgeting, contracts, subcontracting, registration, construction planning, scheduling, bidding, liability, insurance, and bonding. A review of professional ethics including the engineer in society, business and profession with case studies of professional responsibility and ethics decisions. Cross listed with CE 3100. *Prerequisites:* CE 2100 or ARE 2100.

**3200. Structural Analysis I. 3.** Introductory design and analysis topics in stress and displacement analysis of structures, including beams, trusses and frames, classical flexibility and stiffness methods. Cross listed with CE 3200. *Prerequisite:* ES 2410.

**3210. Civil Engineering Materials. 3. [WB▶(none)]** Laboratory investigation and design of materials used in civil engineering: metals, masonry, concrete and timber. Non-destructive evaluation of materials. Analysis and presentation of data, including various types of written reports and oral presentations. Cross listed with CE 3210. *Prerequisites:* WA and ES 2410.

**3300. Building Electrical and Plumbing Systems. 3.** Introduction to National Electrical Code. The topics include basic circuits, AC and DC single phase, three phase power, transients, capacitance and inductance, branch circuits. Study of plumbing systems and fixtures including wastewater, water supply, storm water, and venting systems. Study of International Plumbing Code. *Prerequisites:* ES 2210, ES 2330, and ARE 2410.

**3360 [3430, 4420]. Fundamentals of Transport Phenomena. 3.** Basic concepts of heat and mass transfer and their applications to problems involving engineering analysis and design. Topics include steady-state and transient conduction, free and forced convection (heat and mass), radiation and heat exchangers. Cross listed with ESE/ME 3360. *Prerequisites:* MATH 2310, ES 2310 and ES 2330. (Offered both semesters)

**3400 [3800]. Heating, Ventilating and Air Conditioning of Buildings. 3.** Qualitative and quantitative study in concepts of basic

air-conditioning with focus on buildings including building envelope, moist air thermodynamics, human comfort, thermal load calculations, thermal behavior of buildings, HVAC systems/equipment, and design of space air-conditioning and its relationship to architectural design. Cross listed with ME 3400. *Prerequisites:* ES 2310, ES 2330, and either ARE 2410 or ME 3360.

**3600. Architectural Design Studio III. 3.** Junior-level architectural design in a project-based learning environment using Building Information Modeling (BIM). This course builds upon skills learned in ARE 2600, with a new emphasis on the complexities that accompany mid-rise construction, and the integration of structural and mechanical systems. *Prerequisites:* ARE 2410 and ARE 2600.

**4030. History of Green Building. 3.** Examines Green Building themes as practiced in the past and present. Areas of emphasis are: methods of heating, cooling and lighting in pre-modern buildings; the history of mechanical heating, cooling and lighting as related to architecture; and connections between exemplary contemporary buildings and historical examples. *Prerequisites:* ARE 2410 and 3030.

**4040. Historic Preservation and Sustainability. 3.** Explores the historic preservation and sustainability movements and contemporary practices in these inter-related fields. Through reading, lectures, discussions and site visits, students will study how the historic preservation and the building industry professions can address advanced issues in sustainability related to the environment, culture and economics. Cross listed with AMST 4040. *Prerequisites:* 6 hours in AMST or ARE.

**4200. Structural Analysis II. 3.** Stress and displacement of indeterminate structures. Determination of loads on buildings. Matrix stiffness methods. Cross listed with CE 4200 *Prerequisite:* ARE/CE 3200.

**4250. Structural Steel Design. 3.** Design of structural components and applications utilizing steel. Cross listed with CE 4250. *Prerequisite:* ARE/CE 4200 or concurrent enrollment.

**4260. Structural Concrete Design. 3.** Design of structural components and systems using reinforced concrete. Cross listed with CE 4260. *Prerequisite:* ARE/CE 3200.

**4280. Reinforced Masonry Design. 3.** Design of structural components in reinforced masonry buildings, including walls, columns, beams and connections. Particular attention is paid to current codes, specifications and analysis. Cross listed with CE 4280. *Prerequisite:* ARE/CE 4260 and concurrent enrollment in ARE/CE 4200. (Normally offered fall semester)

**4295 [4290]. Structural Timber Design. 3.** Design of structural components and systems utilizing timber. Cross listed with CE 4295. Dual listed with ARE 5295. *Prerequisite:* CE 3200 or equivalent.

**4330. Building Electrical Systems. 3.** Analysis and design of electrical systems in buildings using the National Electrical Code. The topics include panel boards, motors, system sizing, electrical distribution in buildings, methodology of reducing the available short circuit current, transformers, capacitors in buildings, and power systems harmonics. Students will perform an electrical building design project. *Prerequisites:* ARE 3300.

**4390. Building Safety and Fire Protection. 3.** Fundamentals of building design for fire and life safety. Emphasis is on a systematic design approach. Basic considerations of building codes, fire loading, fire resistance, means of egress design, introduction to protective systems including fire protection systems, and fundamentals of fire and smoke control. *Prerequisites:* ARE 3300.

**4430 [3420, 4810]. HVAC Systems Analysis and Design. 3.** Engineering design and performance analysis procedures for commercial building mechanical systems including energy conservation techniques. Relationship to aesthetic, architectural and structural elements are considered. Cross listed with ME 4430. *Prerequisites:* ARE/ME 3400. (Normally offered alternate spring semesters)

**4440 [3500]. Building Acoustics. 3.** A study of the acoustical environment of buildings, including basic theory with an emphasis on room acoustics and mechanical system noise and vibration. *Prerequisite:* ARE 3400. (Normally offered alternate fall semesters)

**4470. Alternative Energy Sources and Applications. 3.** An introduction to energy conversion systems likely to become significant sources of energy in the coming decades is presented. Some specific areas that will be discussed include existing energy demands and policy, origin of energy, wind, solar, biomass, and nuclear energy, and energy storage. This course is typically offered every 3<sup>rd</sup> semester. Cross listed with ME 4470. *Prerequisite:* ME 3360/ARE 3360.

**4480. Building Air and Hydronic Systems. 3.** Design and analysis of building air and hydronic systems with focus on the application, design and analysis of thermal energy distribution systems (air and hydronic systems) for building space air conditioning. Requires enrollment in associated laboratory session. Cross listed with ME 4480. *Prerequisite:* ARE/ME 4430.

**4490. Modeling and Optimization of Energy Systems. 3.** Application of principles of thermodynamics, fluids, and heat and mass transfer in the component and system-level design of energy/thermal systems, including modeling, simulation and optimization techniques. Examples are drawn from building environmental control, energy conversion and thermal industrial processes. Students work on projects for integration of these components in the design of energy/thermal systems. Requires enrollment in associated laboratory session. Cross listed with ME 4490. *Prerequisites:* ARE/ME 3400.

**4600. Architectural Design Studio IV. 3.** Senior-level architectural design in a project-based learning environment using Building Information Modeling (BIM). The course builds upon skills learned in ARE 3600, with a new emphasis on the complexities that accompany high-rise construction, and the integration of structural and mechanical systems. *Prerequisite:* ARE 3600.

**4720. Structural Systems Design Project. 4.** Final course in the building structural systems sequence incorporating elements of previous design courses by executing design of a hypothetical building with a concentration on a detailed design of the project's structural systems. *Prerequisites:* ARE 4200, 4250, 4260, and 4600.

**4740. Mechanical Systems Design Project. 4.** Final course in the building mechanical systems sequence incorporating elements of previous design courses by executing design of a hypothetical building with a concentration on a detailed design of the project's mechanical systems. *Prerequisites:* ARE 3300, ARE 3400, ARE 4600, and one of ARE 4330, ARE 4390, ARE 4430, or ARE 4490.

**4920. Senior Architectural Engineering Problems 1-3 (Max. 6).** A study of current engineering design problems that are applicable to architectural engineering either on an individual basis or for small seminar type groups. Not for graduate credit. *Prerequisite:* senior standing or consent of department head.

**5295. Structural Timber Design. 3.** Design of structural components and applications utilizing timber. Cross listed with CE 5295. Dual listed with ARE 4295. *Prerequisite:* CE 3200 or equivalent.

**5400. Building Energy Management. 3.** A rigorous treatment of issues related to the judicious use of energy in the design and use of buildings is provided. Energy-efficient HVAC systems and system control, energy-conscious building design, building energy analysis, auditing, building envelope, energy-efficient lighting design, energy management pro-

grams, energy sources and conservation, rate schedules, waste-heat recovery, passive solar heating/cooling and daylighting. *Prerequisites:* ARE 3430, 4460.

**5600. Collaborative BIM Design. 3.** An advanced comprehensive building design course integrating architectural and engineering skills, where design decisions are supported by performance simulation and analysis. Students will use Building Information Modeling (BIM) software and simulate a professional Integrated Project Delivery (IPD) experience by collaborating with a practicing architect on a real-world project. *Prerequisites:* ARE 3100, ARE 4600.

**5700. Architectural Engineering Problems I. 1-3 (Max. 6).** A special course, designed to make possible the study and investigation of problems or phases of architectural engineering selected to fit the needs of the students. *Prerequisite:* consent of instructor.

## Land Surveying

A minor in Land Surveying requires 31 hours of specific course work. This minor meets the Wyoming Board of Registration for Professional Engineers and Professional Land Surveyor's surveying education requirements for eligibility as a Land Surveyor in Training. The Land Surveying minor may be paired with any major. With the exception of CE 2070, all classes are offered distance learning through Outreach Credit Programs.

### Land Surveying Minor Curriculum Requirements:

LS	2110	.....	3
CE	2070 or LS 2010 and LS 2015	.....	3
LS	3130	.....	3
LS	3100	.....	2
LS	2400	.....	2
LS	2020	.....	4
ENTK	2500 <sup>1</sup>	.....	3
LS	3200	.....	3
LS	3210	.....	4
LS	3120	.....	2
LS	3110	.....	2
	<b>Total Hrs.</b>		<b>31</b>

<sup>1</sup>Computer Aided Drafting 1 offered through Sheridan College Outreach Programs.

## Land Surveying (LS)

**2010 [CE 2072]. Engineering Surveying Lecture. 2.** Principles of measurements of distances, elevation and angles. Basic error theory in measurement and calculations. Basic principles of surveying and map making. *Prerequisite:* a working knowledge of algebra and trigonometry.

**2015 [CE 2073]. Engineering Surveying Laboratory. 1.** Field surveying activities consisting of traversing, differential leveling, construction staking and gathering topographic data. *Prerequisite:* LS 2010 or concurrent.

**2020 [CE 2090]. GPS for Land Surveyors. 4.** From fundamental theory to practical application and advanced technologies, this class covers all aspects of GPS needed to understand and use GPS as a land surveyor including the basics of GPS technology, common hardware, surveying methods, survey design, planning and observing, real-time kinematics and DGPS. *Prerequisites:* LS 2400.

**2100 [CE 2076]. Records Research for Surveyors. 3.** Introduced to the public, quasi-public, and private depositories of recorded and non-recorded documents that establish land ownership boundaries, easement boundaries, and land use rights and restrictions in both the Public Land Survey System and the Colonial States. Assignments will require work to be conducted during depositories' normal business hours.

**2110 [CE 2050]. Real Property Law. 3.** Covers all major areas of real property law, including the nature of real property, types of ownership, real estate contracts, title and insurance, financing, landlord and tenant, land use, environmental law and regulation. An understanding of real property law is fundamental to understanding boundary law.

**2400 [CE 2089]. Basic Geodesy for Today's Land Surveyor. 2.** The history of geodesy including measurement techniques, coordinate systems, ellipsoids, and datums is reviewed. The modern geodetic and Cartesian coordinates systems, as well as the differences between grid and ground coordinates systems, and the current geodetic and Cartesian coordinate systems available today are discussed. *Prerequisite:* CE 2070 or LS 2010.

**2410 [CE 2083]. GIS in Surveying. 3.** Covers the basic concepts of geographic information systems, the methods and software used to implement them, and their applications to surveying and analysis of other surveying problems. *Prerequisites:* CE 2070 or LS 2010, and ES 1060 or ES 1061.

**3100 [CE 2088]. Real Property Descriptions. 2.** Historical and current issues for land description writing and usage for the practicing surveyor. Relationship between written descriptions and field survey data, interpreting old descriptions and the structure principles of description. *Prerequisites:* CE 2070 or LS 2010, and LS 2100 and LS 2110.

**3110 [CE 3750]. Boundary Evidence. 2.** A practical and working guide to understanding survey evidence and the laws of boundary

location for efficient, accurate boundary determination. This material aids in the elimination of errors in location of land boundaries. The surveyor's liability and statutes of limitations are explored in depth. Also included are discussions of the surveyor's role in court. Normally offered only through the Outreach School. *Prerequisites:* CE 2070 or LS 2010, and LS 2110.

**3120 [CE 3740]. Boundary Principles. 2.** This course in boundary law addresses the fundamental principles of real property as applied to land surveying and related professions. Discussion and applications center on practical situations and concepts commonly encountered while conducting boundary surveys and the determination of the extent of ownership rights. Students explore the scope of the surveyors' judiciary role in real property ownership. Primarily offered through the Outreach School. *Prerequisites:* CE 2070 or LS 2010, and LS 3100 and LS 2110.

**3130 [CE 2085]. Public Land Surveys. 3.** Basic fundamentals of the Public Land Survey System (PLSS), dependent and independent resurveys, survey plats, "bona fide rights", riparian boundaries, non-rectangular entities, corner evidence and the role of the modern day surveyor. *Prerequisites:* CE 2070 or LS 2010, and LS 2110.

**3200 [CE 3710, CE 4710]. Route Surveying. 3.** Laying out of super elevation and circular, parabolic, and spiral curves; the difference between highway and railway horizontal curve geometry; offsets to spiral curves as boundaries; area and volumes of earthwork. *Prerequisites:* CE 2070 or LS 2010, and ES 1060 or ES 1061.

**3210 [CE 3720, CE 4720]. Advanced Surveying. 4.** Advanced topics in surveying computations and procedures, including traverse error analysis, topographic surveying, mapping, astronomical observations, coordinate geometry applications, and state plane coordinates. *Prerequisite:* CE 2070 or LS 2010.

**3230 [CE 3760]. Applied Least Squares Adjustments. 4.** The use of applied statistics in land surveying, error propagation in polygon and link traverses, discussion of positional tolerances and an introduction to least squares adjustments using StarNet and VectorNT software. *Prerequisite:* CE 3720 or LS 3210.

**3300 [CE 2074]. Ethics for the Professional Surveyor. 1.** Introduction to the common ethical and moral issues facing professional surveyors in modern practice. *Prerequisite:* One of LS 3110, LS 3120 or LS 3130.

**3400 [CE 4750]. Remote Sensing/Photogrammetry for Surveyors. 3.** Procedures and methods used for deriving metric information from photographs, analog processes for using aerial photographs in production of

topographic maps, flight planning, and cost estimation in aerial mapping work. Introduction to photocoordinate measurement devices and their calibration. Mathematics of modern photogrammetry. *Prerequisite:* CE 2070 or LS 2010.

**4110 [CE 4700]. Coastal Water Boundaries. 3.** The physical and legal issues involved with property rights of lands abutting tidal waters, a review of the Public Land Survey System, the Submerged Lands Act and the Swamp and Overflowed Lands Act. Includes case law research. *Prerequisites:* LS 3110, LS 3120.

**4120 [CE 4730]. Inland Water Boundaries. 3.** Introduces the physical and legal issues involved in locating property rights associated with lands that abut non-tidal, navigable and non-navigable rivers and lakes. The property rights which attach to, as well as the limitations placed on these riparian parcels will be examined and discussed with respect to statutory, administrative and case law. *Prerequisite:* LS 4110.

**4130 [CE 2086, CE 4740]. Advanced Public Land Surveys. 4.** Advanced topics in situations and problems in the Public Land Survey system, with discussion of major court cases involving everyday applications to surveyors. 1975 BLM casebook and other sources of survey reference. *Prerequisites:* LS 3120 and LS 3130.

## Department of Computer Science

4083 Engineering Building, 766-5190

FAX: (307) 766-4036

Web site: [www.cs.uwyo.edu](http://www.cs.uwyo.edu)

Department Head: James Caldwell

### Professors:

**THOMAS A. BAILEY, JR.**, B.S. Alma College 1964; M.S. University of Colorado 1969; Ph.D. Michigan State University 1978; Professor of Computer Science 1998, 1980.

**JOHN R. COWLES**, B.A. University of Wyoming 1968; M.A. University of Nebraska 1970; Ph.D. Pennsylvania State University 1975; Professor of Computer Science 1992, 1978.

**JEFFREY VAN BAALEN**, B.S. University of Wyoming 1977; M.S. 1980; Ph.D. Massachusetts Institute of Technology 1988; Professor of Computer Science 2002, 1991.

### Associate Professors:

**JAMES L. CALDWELL**, B.S. State University of New York at Albany 1984; M.S. 1988; M.S. Cornell University 1995; Ph.D. 1998; Associate Professor of Computer Science 2004, 1998.

**RUBEN GAMBOA**, B.S. Angelo State University 1984; M.S. Texas A&M University 1986; Ph.D. The University of Texas 1999; Associate Professor of Computer Science 2007, 2002.

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**LIQIANG WANG**, B.S. Hebei Normal University 1995; M.Eng. Sichuan University 1998; M.S. SUNY Stony Brook 2003; Ph.D. 2006; Associate Professor of Computer Science 2012, 2006.

### Assistant Professors:

**AMY BANIC**, B.S. Duquesne University 2003; M.S. University of North Carolina 2005; Ph.D. 2008; Assistant Professor of Computer Science 2012, 2010.

**JEFF CLUNE**, BA. University of Michigan 1999; M.A. Michigan State University 2005; Ph.D. Michigan State University 2010; Assistant Professor of Computer Science 2013.

### Senior Lecturer:

**ALLYSON A. ANDERSON**, B.S. University of Wyoming 1991; M.S. 1994; Senior Lecturer of Computer Science 2008, 1994.

**JAMES S. WARD**, B.S. University of Wyoming 1993; M.S. 1997; Senior Lecturer of Computer Science 2011, 2000.

### Associate Lecturer:

**KIM BUCKNER**, B.S. Chapman University 1993; M.S. University of Tennessee, Knoxville 1998; Ph.D. 2003; Associate Lecturer of Computer Science 2014, 2008.

### Professor Emeritus:

Henry R. Bauer III  
John Rowland

### Lecturer Emeritus:

Jeri R. Hanly

A Bachelor of Science degree (B.S.) in Computer Science prepares students for careers in virtually any industry or to continue on with graduate study in Computer Science and many other fields. Computer science students learn to approach problems from a computational (algorithmic) point of view, this approach to problem solving often leads to better and more general solutions. Software systems, information technology, and large scale data applications are core technologies in every area and the applications continue to grow with software and information systems becoming more and more embedded in the fabric of everyday life. These systems are essential tools in science and engineering, for business and finance, government, communications, medicine, and entertainment.

Software systems make the world go round and smart devices, such as phones, tablets, glasses, wearable devices, medical implants are ubiquitous. As a result, computer science has grown from a specialized field to an independent, broadly based area that studies all aspects of the use and understanding of software systems, information, and computational processes. Students studying B.S. in Computer Science at the University of Wyoming can study for the B.S. degree in Computer Science and have the option to focus their studies by taking a concentration in Business, Big Data or International Engineering. All of the Computer Science concentrations lead to a Bachelor of Science in Computer Science and all programs are ABET accredited.

### Program Objectives

The following are the measurable objectives for graduated computer science students (ABET Standards):

1. Have successfully applied the fundamentals of computer science to solve software-oriented computing problems.
2. Have effectively communicated within and outside the discipline and work effectively with others.
3. Have extended their knowledge by independent learning and continuing education.
4. Appreciate the role of computer science in the societal context and appreciate the importance of ethics in the practice of the profession.

### Program Learning Outcomes

The program of study in Computer Science enables students to achieve, by the time of graduation:

- (a) An ability to apply knowledge of computing and mathematics appropriate to the discipline;
- (b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution;
- (c) An ability to design, implement and evaluate a computer-based system, process, component, or program to meet desired needs;
- (d) An ability to function effectively on teams to accomplish a common goal;
- (e) An understanding of professional, ethical, legal, security, and social issues and responsibilities;

- (f) An ability to communicate effectively with a range of audiences;
- (g) An ability to analyze the local and global impact of computing on individuals, organizations and society;
- (h) Recognition of the need for, and an ability to engage in, continuing professional development;
- (i) An ability to use current techniques, skills, and tools necessary for computing practices.
- (j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices;
- (k) An ability to apply design and development principles in the construction of software systems of varying complexity.

### Computer Science Undergraduate Major

This major consists of a core set of courses plus a concentration chosen by the student from one of: Computer Science, Computers and Business, International Engineering, or Big Data. In addition to these courses, Computer Science majors must satisfactorily meet the requirements of the University Studies Program (USP). See the front sections of this catalog for specifics on the USP. Note that some of the courses required for the Computer Science core or the concentrations will meet some of the USP requirements. Students do not have to take additional courses to meet those requirements. All courses in Computer Science, Mathematics, Application Area (Big Data) and Statistics must be completed with a grade of C or better. A grade of C- is not acceptable.

### Computer Science Core

These courses, along with the USP requirements, provide a basic set of skills that all Computer Science majors should master.

#### Computer Science Core (all concentrations)

	<b>Hrs.</b>
Computer Science courses	
COSC 1010: Intro to Computer Science .....	4
COSC 1030: Programming I .....	4
COSC 2030: Programming II .....	4
COSC 2150: Computer Organization .....	3
COSC 3011: Software Design .....	3
COSC 3020: Algorithms & Data Structures .....	4

COSC 3050: Ethics .....	1
COSC 4950: Senior Design I .....	1
COSC 4955: Senior Design II .....	2
Mathematics & Science courses	
MATH 2200: Calculus I .....	4
MATH 2205: Calculus II .....	4
COSC/MATH 2300: Discrete Mathematics .....	3
Statistics Course: one of STAT 2010, 2050, 2070, or 4220 .....	4
Science Courses: must take 4, 4-hour science courses outside of Computer Science. See NOTE below .....	16

NOTE: Courses meeting the Science requirement must have a lab component and be for science or engineering majors. Two must be chosen from a tightly-coupled series - CHEM 1020 & 1030 or CHEM 1050 & 1060 or PHYS 1110 & 1120 or PHYS 1210 & 1220 or PHYS 1310 & 1320 or LIFE 1010 & (2022 or 2023). See Department web pages for a current list of other approved courses.

### Computer Science

These elements of the Computer Science program concentrate on the creation and understanding of computer software. The curriculum focuses first on programming and then on the central processes that support programming: operating systems, programming languages, and computational theory.

<b>Computer Science</b>	<b>Hrs.</b>
Computer Science courses	
COSC 3015: Functional Programming .....	3
COSC 4740: Operating Systems .....	4
COSC System Course:	
COSC 4760: Networks or	
COSC 4820: Databases .....	3
COSC Theory Course:	
COSC 4100: Foundations or	
COSC 4200: Computability .....	3
COSC Language Course:	
COSC 4780: PPL or	
COSC 4785: Compilers .....	3
COSC Electives: upper division, 12 hours.	
At most 3 hours of COSC 3970 can be counted toward this requirement. ....	12
Mathematics courses	
Math Electives: 6 hours from MATH courses above Calculus II or STAT courses 3000 level and up. Exceptions: cannot count MATH 2350, MATH 2355, MATH 4000, or any variable credit courses toward this requirement .....	6
Other courses	
Upper Division Electives: 6 hours from any department .....	6
Free Elective: 3 hours from any department. Must be 1000 level or higher .....	3

## Computers and Business Concentration

An understanding of business fundamentals is essential for students planning a career in applied computer science in a business environment. This program of study provides a foundation in computer science, business and information management. It includes courses in accounting, management, marketing, database fundamentals, and design and implementation of software systems. The curriculum leads to the Bachelor of Science in Computer Science degree.

It is highly recommended that students in this concentration declare a Business minor, since they will meet all the requirements without any additional courses. If you are planning on attending graduate school in Computer Science, then you should take COSC 4740 for the operating systems course and COSC 4100 or COSC 4200 and COSC 4780 or COSC 4785 for the two computer science electives.

### Computers and Business Hrs.

Computer Science courses	
COSC 4210: Analysis and Design .....	3
COSC 4220: Design and Implementation ....	3
COSC 4820: Databases.....	3
COSC O/S Course: one of	
COSC 3750: Linux Programming or	
COSC 4740: Operating Systems or	
COSC 4750: Systems Programming .....	3
COSC Elective: upper division, 6 hours.	
At most 3 hours of COSC 3970 can be	
counted toward this requirement .....	6
Business courses	
ACCT 1010: Accounting I .....	3
ACCT 1020: Accounting II .....	3
MGT 1040: Legal Environment of	
Business .....	3
MGT 3110: Business Ethics.....	3
MGT 3210: Management and Organization	3
MKT 3210: Intro to Marketing.....	3
FIN 3250: Corporate Finance.....	3
Business Elective: 3 hour upper division	
Business course.....	3
Other courses	
Upper Division Elective: 3 hours from any	
department .....	3

## International Engineering Concentration

Computer Science is a global profession, and today's computer scientists must be able to work and interact in a variety of diverse cultural and technical environments. The international engineering concentration gives computer science students an opportunity

to study culture and foreign language at the same time as they pursue their computer science degrees.

The concentration includes at least one semester of study abroad. In addition, students may participate in a four-to-five month international internship. Foreign language skills can be earned through a variety of means, including formal university coursework, intensive summer language programs, and previous education.

### International Engineering Hrs.

Computer Science courses	
COSC 3015: Functional Programming .....	3
COSC 4740: Operating Systems .....	4
COSC System Course:	
COSC 4760: Networks or	
COSC 4820: Databases .....	3
COSC Theory Course:	
COSC 4100: Foundations or	
COSC 4200: Computability.....	3
COSC Language Course:	
COSC 4780: PPL or	
COSC 4785: Compilers.....	3
COSC Electives: upper division, 12 hours.	
At most 3 hours of COSC 3970 can be	
counted toward this requirement. ....	12
Mathematics courses	
Math Electives: 6 hours from COSC 4340	
or MATH courses above Calculus II	
or STAT courses 3000 level and up.	
Exceptions: cannot count MATH	
2350, MATH 2355, MATH 4000, or	
any variable credit courses toward this	
requirement .....	6
Foreign Language	
Foreign Language Courses: 4 semesters (or	
equivalent, see above) of a single foreign	
language .....	15
Other courses	
Upper Division Electives: 6 hours from any	
department .....	6
Free Elective: 3 hours from any department.	
Must be 1000 level or higher .....	3

## Big Data Concentration

Big data is high volume, high velocity, and/or high variety assets that require new forms of processing to enable enhanced decision making, insight discovery and process optimization. The Big Data Concentration directs the students toward data handling (AI, visualization, data mining, and machine learning) courses, data analysis (statistics) courses, and adds an interdisciplinary Application Area component (chosen from a specific set of courses) that will broaden the student's experience in processing varied forms of data.

It is highly recommended that students in this concentration declare a Statistics minor, since they will meet all the requirements without any additional courses. If you are planning on attending graduate school in Computer Science, then you should take COSC 4740 for the operating systems course and COSC 4100 or COSC 4200 and COSC 4780 or COSC 4785 for the two computer science electives.

### Big Data Hrs.

Computer Science courses	
COSC 4450: Graphics .....	3
COSC 4550: Intro to Artificial Intelligence ..	3
COSC 4555: Machine Learning.....	3
COSC 4570: Data Mining.....	3
COSC 4820: Databases.....	3
COSC O/S Course:	
COSC 3750: Linux Programming or	
COSC 4740: Operating Systems or	
COSC 4750: Systems Programming .....	3
COSC Electives: upper division, 6 hours.	
At most 3 hours of COSC 3970 can be	
counted toward this requirement .....	6
Mathematics and Science courses	
MATH 2250: Linear Algebra .....	3
STAT 3050: Statistical Methods .....	3
STAT 4015: Regression Analysis .....	3
STAT 4045: Categorical Data Analysis .....	3
STAT 4115: Time Series Analysis .....	3
Application Area Course, one of	
MOLB 4495 or BOT 4550 or	
CHEM 4560 or GEOG 4220 or	
PHYS 4830; see department web pages for	
the most current list of approved	
courses .....	3

## Computer Science Minor Requirements

Requirements for a minor in Computer Science are as follows:

A total of 18 credits of computer science courses

All 18 credits must have a grade of C or better. A grade of C- is not acceptable.

## Graduate Study

The Department of Computer Science offers graduate work leading to the master of science degree in computer science and the doctor of philosophy in computer science.

## Program Specific Admission Requirement

Applicants must meet the minimum standards of the university.

Acceptance will be based on the student's academic records.

High performing undergraduates in computer science can elect for Quick Start admission to the graduate program, allowing the sharing of up to six credit hours of 5000-level coursework toward the completion of both the B.S. and the graduate degree programs.

For the master's degree and the Ph.D. program, the following courses or their equivalent are considered preparatory for graduate work in computer science: COSC 3020, COSC 4100 or 4200, COSC 4740, and COSC 4780 or 4785. Students admitted to the program must show proficiency in these courses.

An applicant whose previous studies are in a field significantly removed from computer science may be admitted to the regular master's degree or the Ph.D. program on the condition that he or she take additional courses to remove deficiencies in his or her computer science background.

Admission to the master's degree program or the conferring of a master's degree will not constitute a de facto admission to the Ph.D. program.

## Program Specific Degree Requirements

### M.S. Program

Each M.S. student will have a supervising committee of at least three members appointed. The committee will consist of at least two members of the computer science faculty and at least one non-COSC faculty member.

Both Plan A and Plan B students must complete the Core Requirements and the Breadth Requirements.

Both Plan A and Plan B students are required to formally defend (Plan A) or present (Plan B), their theses or papers, which describe their work, as a public colloquium before their supervising committees and a public audience. All defenses and presentations must be open and announced at least two weeks in advance. The thesis or paper must be distributed to the committee at least two weeks in advance of the defense or presentation. If the student does not pass the defense or presentation, the committee will instruct the student as to what needs to be accomplished (and by when) to pass.

Upon completion of the requirements for the Plan A or Plan B M.S. programs, a student enrolling in the Ph.D. program also meets the Core Requirements and the Breadth Requirements for the Ph.D. program. The Ph.D. oral qualifying exam may also be waived at the

discretion of the student's Ph.D. supervising committee. Courses completed towards the M.S. degree may be counted towards the Ph.D. course requirements.

### Plan A (thesis)

A total of at least 33 credit hours at the 4000 level or above must be completed. The student must complete a minimum of 29 hours of courses, including the Core Requirements and the Breadth Requirements, and a minimum of 4 hours of COSC 5960 (Thesis Research). At least 20 credit hours must consist of computer science department courses. At least 15 credit hours must be at the 5000 level, not including seminars, COSC 5050, Independent Study, and Research. No more than 6 hours of 4000-level computer science coursework may be counted toward the total credit requirement. Coursework from other departments may count towards degree requirements with the approval of the supervising M.S. committee.

### Plan B (non-thesis)

A total of at least 33 credit hours at the 4000 level or above must be completed. The student must complete a minimum of 32 hours of courses, including the Core Requirements and the Breadth Requirements, and a minimum of 1 hour of COSC 5960 (Thesis Research). At least 20 hours must consist of computer science department courses. At least 15 credit hours must be at the 5000 level, not including seminars, COSC 5050, Independent Study, and Research. No more than 6 hours of 4000-level computer science coursework may be counted toward the total credit requirement. Coursework from other departments may count towards degree requirements with the approval of the supervising M.S. committee.

UW Coursework Requirements for M.S. Transfer Students: M.S. transfer students must complete at least 21 credit hours at the University of Wyoming. At least 12 credits of the Core Requirements and the Breadth Requirements must be taken at the University of Wyoming. No more than one class per category of breadth may be counted towards this 12-credit total. The research writing course and algorithms course credits may be counted toward this 12-credit total. Seminar credits may not be counted toward this 12-credit total.

## Summary of Credit Requirements

### Plan A

Core: COSC 5110 and 5050 .....	6
Core: COSC 5000 seminar .....	2
Breadth: theory course, AI course, two systems courses .....	12
Additional courses.....	9
Thesis/Dissertation (COSC 5960/5980).....	4
<b>Total Hrs.</b>	<b>33</b>

### Plan B

Core: COSC 5110 and 5050 .....	6
Core: COSC 5000 seminar .....	2
Breadth: theory course, AI course, two systems courses .....	12
Additional courses.....	12
Thesis/Dissertation (COSC 5960/5980).....	1
<b>Total Hrs.</b>	<b>33</b>

### Ph.D.

Core: COSC 5110 and 5050 .....	6
Core: COSC 5000 seminar .....	4
Breadth: theory course, AI course, two systems courses .....	12
Additional courses.....	20
Thesis/Dissertation (COSC 5960/5980)....	12
Other credits (may include courses or COSC 5960/5980) .....	18
<b>Total Hrs.</b>	<b>72</b>

### Ph.D. Program

Each doctoral student will have a supervising committee of at least five members appointed. The primary functions of this committee are to suggest coursework, to administer the qualifying, preliminary, and final examinations, and to oversee and evaluate the research of the candidate. The committee will consist of at least three members of the computer science department faculty and at least one non-COSC faculty member. The standards that this committee should consider when recommending programs of study are outlined in the following sections.

#### Coursework Requirements

A total of at least 72 credit hours at the 4000-level or above must be completed. A minimum of 42 of these credit hours must be taken as coursework, including the Core Requirements and the Breadth Requirements. A minimum of 12 hours of COSC 5980 (Dissertation Research) must be taken. No more than 6 hours of 4000-level computer science coursework and no more than 12 hours total of 4000-level coursework, may be counted toward the total credit requirement. Coursework from other departments may count towards degree requirements with the approval of the supervising Ph.D. committee. All course

requirements MUST be completed or enrolled with satisfactory midterm progress prior to scheduling the Ph.D. Final Examination.

#### *UW Coursework Requirements for Ph.D. Transfer Students*

Ph.D. transfer students must complete at least 24 credit hours at the University of Wyoming. At least 12 credits of the Core Requirements and the Breadth Requirements must be taken at the University of Wyoming. No more than one class per category of breadth may be counted towards this 12-credit total. The research writing course and algorithms course credits may be counted toward this 12-credit total. Seminar credits may not be counted toward this 12-credit total.

#### *Program*

A program of original and innovative research will be undertaken by the candidate. At the end of this program, the candidate will document this research in a dissertation. The dissertation will present the details and results of the candidate's research in addition to providing a critical comparison with relevant previously-published works.

Each successful doctoral student must pass three examinations. These include a qualifying examination, a preliminary examination, and a final (dissertation) defense.

#### *Qualifying Exam Criteria*

The student must complete the Core Requirements and pass a closed oral examination on a research area administered by the supervising committee. Although closed to the public, faculty members of the Department of Computer Science are welcome to attend. The exam must be announced to the faculty at least two weeks in advance. The research area will be chosen in consultation with the committee. The student must demonstrate background knowledge of the state of the art in the area and preliminary work. This will involve, but is not limited to, presenting material and answering questions covering the relevant area knowledge. The format of the exam will be defined by the committee prior to the exam to allow for sufficient preparation. This examination is intended to motivate the candidate to review relevant literature extensively prior to pursuing the original and innovative portions of the research. Qualifying exam criteria must be completed within the first 4 semesters of enrollment in the Ph.D. program. If the student does not pass the qualifying exam, the committee will instruct the student as to what needs to be accomplished (and by when)

to pass. The closed oral examination requirement may be waived for a student who has completed an M.S. degree in COSC at UW if their M.S. presentation was at a research level that demonstrated background knowledge of the state of the art in the area, at the discretion of the supervising Ph.D. committee.

#### *Preliminary Exam Criteria*

Prior to scheduling the Preliminary Examination, the student must be making satisfactory progress towards completion of their course requirements, including the Breadth Requirements. A Preliminary Examination will consist of a presentation and defense of the already-completed portion of the dissertation research and the research that is proposed to complete the dissertation. The Preliminary Examination must be open and announced at least two weeks in advance. The preliminary examination must be completed within 8 semesters of enrollment in the Ph.D. program. This examination is intended to motivate the candidate to make significant progress on work towards their Ph.D. dissertation and propose milestones for completion. If the nature of the proposed continued research and methodology is deemed to be sufficiently original and innovative by the supervising committee, then the committee will approve the research direction after having administered this examination. If the student does not pass the preliminary exam, the committee will instruct the student as to what needs to be accomplished (and by when) to pass.

#### *Option for M.S. degree en route to Ph.D.*

After completing the Qualifying Exam and Preliminary Exam, a Ph.D. student may additionally earn an M.S. degree after completing the remaining M.S. course requirements, including the Breadth Requirements. COSC 5980 may be substituted for COSC 5960 in the M.S. requirements at the discretion of the supervising committee. The M.S. degree will be granted only after completion of the preliminary exam. For an M.S. degree to be granted prior to completion of the preliminary exam, the student should enroll in the M.S. degree program and complete the remaining M.S. requirements.

#### *Final Exam Criteria*

Prior to scheduling the Ph.D. Final Examination (often referred to as a "defense"), all course requirements, including the Breadth Requirements, MUST be completed or enrolled with satisfactory midterm progress. The Final Examination (dissertation defense) will

consist of an oral presentation by the candidate of his/her research and the results that were derived. At this examination, the candidate is expected to defend the research as being original and contributory to the discipline of computer science. The Final Examination must be open and announced at least two weeks in advance. The dissertation must be distributed to the supervising committee at least two weeks in advance of the Final Examination. If the student does not pass the final exam, the committee will instruct the student as to what needs to be accomplished (and by when) to pass.

#### *Time to degree for part-time students*

Exceptions to the completion deadlines for the Qualifying Exam and Preliminary Exam may be made for part-time students at the discretion of the supervising committee.

## **Computer Science Core Requirements**

Each of the following must be completed with a B or better for COSC 5110 (algorithms) and a Satisfactory for COSC 5050 (research writing) and COSC 5000 (seminars):

- COSC 5110 Analysis of Algorithms
- COSC 5050 Research Writing for Computer Science
- COSC 5000 Seminars: 2 for M.S. students and 4 for Ph.D. students

Students are strongly encouraged to take COSC 5110 the first time it is offered after enrollment.

## **Computer Science Breadth Requirements**

Students must earn a grade of B or better in one class from the Theory category, one class from the Artificial Intelligence Category, and one class from each of two different Systems categories (e.g. one class from Programming Languages and Compilers and one class from Computer Graphics, Visualization, and Interaction). Although some courses may count under multiple categories, a course may only count once towards the breadth requirement. Thus there must be 12 credits taken to satisfy the breadth requirement. Only 5000-level computer science courses may count towards the breadth requirement.

*Theory*

- COSC 5120 Theory of Computation
- COSC 5200 Computational Complexity
- COSC 5220 Languages and Automata
- COSC 5010/20 Theory topics courses as offered (must be approved by the department)

*Artificial Intelligence*

- COSC 5550 Introduction to Artificial Intelligence
- COSC 5555 Machine Learning
- COSC 5560 Modern Robots
- COSC 5010/20 Artificial Intelligence topics courses as offered (must be approved by the department)

*Systems: Programming Languages and Compilers*

- COSC 5750 Computer Architecture
- COSC 5785 Compiler Construction
- COSC 5010/20 Programming Languages and Compilers topics courses as offered (must be approved by the department)

*Systems: Computer Graphics, Visualization, and Interaction*

- COSC 5450 Computer Graphics
- COSC 5730 Mobile Device Programming
- COSC 5010 Human-Computer Interaction
- COSC 5010 Virtual Reality Environment Systems
- COSC 5010/20 Computer Graphics, Visualization, and Interaction topics courses as offered (must be approved by the department)

*Systems: Networking, Distributed Computing, and Data Management*

- COSC 5750 Parallel and Distributed Systems
- COSC 5755 Network Applications
- COSC 5820 Advanced Database Systems
- COSC 5010 High Performance Computing
- COSC 5010/20 Networking, Distributed Computing, and Data Management topics courses as offered (must be approved by the department)

*Academic Dishonesty*

For cases in which a graduate student has admitted to an act of academic dishonesty or has been found culpable through university procedures according to University Regulation 6-802, the graduate committee will meet with the student and faculty member(s) involved to assess the severity of the act. Both the faculty member(s) and the student will be afforded the opportunity to present views and information relevant to the act. The graduate committee may then take action by recommending that the student be terminated from graduate study in the department (for flagrant violations) or that a letter of reprimand be sent to the student with a copy sent to the Office of the Registrar.

## Computer Science (COSC)

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).**

**1010. Introduction to Computer Science I. 4.** Introduces the fundamental concepts of programming from an object-oriented perspective. Topics include simple data types, control structures, array and string data structures, algorithm development, and debugging techniques. Emphasizes good software engineering principles and developing fundamental programming skills in the context of a language that supports the object-oriented paradigm. *Prerequisite:* grade of C or better in MATH 1400 or Level 4 or higher on the Math Placement Exam within one year prior to the start of the course.

**1030. Computer Science I. 4.** Continues the introduction from COSC 1010 to the methodology of programming from an object-oriented perspective. Through the study of object design, introduces the basics of human-computer interfaces, the social implications of computing, with an emphasis on software engineering. *Prerequisite:* COSC 1010 or equivalent experience and concurrent registration in MATH 1405 or MATH 1450.

**1100. Computer Science Principles and Practice. 3.** Introduces use of computers for algorithmic problem solving. Studies scope, major contributions, tools and current status of computer science. Presentation of computer science principles; use of software packages and evaluation of their effectiveness; and elementary programming. *Prerequisite:* C or better in MATH 1400 or in any University Studies QB or Level 4 or higher on Mathematics Placement Exam. (Offered based on sufficient demand and resources)

**1101. First-Year Seminar. 3. [(none)◀▶FYS]**

**1200. Computer Information Systems. 3.** Introduces computers and information processing, computer systems and hardware, computer software, information processing systems, information systems and information resource management. Uses word processing, data base language and electronic spreadsheet program in hands-on exercises. *Prerequisite:* passing of Mathematics Placement Examination at Level 2 or equivalent.

**2000. Undergraduate Topics: Computer Science. 1-3 (Max. 6).** Elementary topics current in computer science. *Prerequisite:* consent of instructor. (Offered based on sufficient demand and resources)

**2030. Computer Science II. 4.** Builds on the introduction to object-oriented programming begun in COSC 1010 and 1030 with an emphasis on algorithms, data structures, and software engineering. *Prerequisite:* COSC 1030.

**2150. Computer Organization. 3.** Introduces students to the organization and architecture of computer systems, beginning with the standard von Neumann model and then moving forward to more recent architectural concepts. *Prerequisite:* COSC 1030.

**2300. Discrete Structures. 3.** Introduces the mathematical concepts that serve as foundations of computer science: logic, set theory, relations and functions, graphs (directed and undirected), inductively defined structures (lists and trees), and applications of mathematical induction. Provides an introduction to abstract and rigorous thinking in advanced mathematics and computer science. Cross listed with MATH 2300. *Prerequisite:* COSC 1030, MATH 2200 or 2350.

**2409. \_\_\_\_\_ Programming. 1-3 (Max. 6).** Describes various computer languages focusing on their differences from prerequisite languages and uses of these new features. *Prerequisite:* consent of instructor. (Offered based on sufficient demand and resources)

**3011. Introduction to Software Design. 3.** Introduces the principles and practice of software design, including UML and design patterns. Uses case studies to illustrate design in action. *Prerequisites:* COSC 2030.

**3015. Functional Programming. 3.** Studies programming in the context of a functional language that emphasizes algorithmic strategies over syntactic detail. *Prerequisites:* COSC 2030 and 2300.

**3020. Algorithms and Data Structures. 4.** Introduces formal techniques to support the design and analysis of algorithms, focusing on both the underlying mathematical theory and practical considerations of efficiency. Topics include asymptotic complexity bounds, techniques of analysis, algorithmic strategies, and



an introduction to automata theory and its application to language translation. *Prerequisites:* COSC 2030 and 2300.

**3050. Ethics for the Computer Professional.**

**1.** The proliferation of computers has had a profound effect on our society. Computing professionals must be aware of the social and ethical implications of our activities. Examines the codes of behavior related to computer science through readings, discussions and case studies. *Prerequisites:* COSC 2030.

**3100. Computer Science Education Seminar. 2.**

Provides an overview of the current social and research issues, technical trends and challenges facing computer science educators. *Prerequisites:* COSC 1030 and Education major only.

**3340. Introduction to Scientific Computing. 3.**

Introduces basic numerical methods to solve scientific and engineering problems. Topics include: code structure and algorithms, basic numerical methods for linear systems, eigenvalue problems, interpolation and data fitting, nonlinear systems, numerical differentiation and integration. Cross listed with MATH 3340. *Prerequisites:* grade of C or better in MATH 2210.

**3750. Linux Programming for System Applications. 3.**

Provide the necessary tools and skills to begin programming effectively on UNIX and Linux operating systems. Topics will include, shells and basic shell scripting, Linux utilities, editors, compilation, I/O and the file system, sockets and interprocess communication, and time permitting, threads. *Prerequisites:* COSC 3020.

**3900. Upper Division Topics in Computer Science. 1-3 (Max. 9).**

Individual or small group pursuit of interdisciplinary problems in the use of computers or study of topics of interest within industry. *Prerequisite:* consent of instructor. (Offered based on sufficient demand and resources)

**3970. Internship in Computing. 1-3 (Max. 3).**

Allows students to gain practical experience in computing. A signed contract with a supervisor and departmental adviser must be completed before enrolling for the internship. *Prerequisite:* COSC 3020.

**4000. Topics in Computer Science for Educators. 1-6 (Max. 12).**

Current computer science topics appropriate for K-12 teachers. Credit may not be applied to major requirements in computer science or management information systems. *Prerequisite:* graduate standing. (Offered based on sufficient demand and resources)

**4010. Special Topics in Computer Science. 1-3 (Max. 9).**

Individual or small group pursuit of interdisciplinary problems in the use

of computers or study of advanced topics. (Maximum of 12 hours from 4010 and 5010 may be applied to graduate study.) *Prerequisites:* COSC 3020 concurrently and consent of instructor. (Offered based on sufficient demand and resources)

**4100. Foundations of Computing. 3.**

Introduces several theoretical areas which are the basis of computer science. Languages and automata, computability, complexity, analysis of algorithms, logic, and the specification and correctness of programs. *Prerequisite:* COSC 3020.

**4200. Computability and Complexity. 3.**

Introduction to theoretical study of computability and efficient computation. Finite-state and pushdown automata; turing machines and the Church-Turing thesis; undecidability, computational complexity; NP-completeness. *Prerequisite:* COSC 3020.

**4210. Analysis and Design of Information Systems. 3.**

Students with information technology skills learn to analyze and design information systems. Practice of software engineering techniques during team-oriented analysis and design of a departmental system. *Prerequisite:* COSC 3020 or concurrent enrollment.

**4220. Design and Implementation in Emerging Environments. 3.**

Students who have completed the analysis and design course extend their knowledge by implementing an information system in an emerging systems environment. Teams use project management principles to implement the system. *Prerequisite:* COSC 4210.

**4340. Numerical Methods for Ordinary and Partial Differential Equations. 3.**

Further develops the skills needed for computational problem solving and numerical analysis. Topics addressed include: one-step and linear multistep methods for solving initial value problems; truncation errors, stability analysis, and convergence of the numerical methods; finite difference approximation for elliptic equations and initial boundary value problems; iterative methods for sparse linear systems. Students typically complete a final project in this course. Cross listed with MATH 4340. *Prerequisites:* grade of C or better in MATH 2310 and MATH 3340.

**4350. System Simulation. 3.**

Introduces simulation and comparison with other techniques. Studies discrete simulation models, and introduction to, or review of, queuing theory and stochastic processes. Compares discrete change simulation languages. Examines simulation methodology including generation of random numbers and variates, design of simulation experiments for optimization, analysis

of data generated by simulation experiments, and validation of simulation models and results. Selected applications of simulation. Dual listed with COSC 5350. *Prerequisites:* COSC 3020; MATH 4250 or STAT 2010.

**4420. Advanced Logic. 3.**

Studies advanced topics in mathematical logic. Takes up such topics as: uninterpreted calculi and the distinctive contributions of syntax and semantics; metatheory, including completeness and consistency proofs; modal logic and semantics; logic as a philosophical tool. Dual listed with COSC 5420; cross listed with MATH/PHIL 4420. *Prerequisite:* PHIL 3420 or equivalent.

**4450. Computer Graphics. 3.**

Introduction to computer graphics, an increasingly important area of computer science. Computer graphics, together with multimedia and the World Wide Web, offers exciting new possibilities for the design of human-computer interfaces. Presents the principles, techniques, and tools that enable these advances. Dual listed with COSC 5450. *Prerequisites:* COSC 3020 and MATH 2250.

**4530. Digital Image Processing. 3.**

Methodologies and algorithms for processing digital images by computer. Includes color spaces, pixel mappings, filtering, image segmentation, geometric operations and pattern classification. Cross listed with EE 4530. *Prerequisites:* MATH 2205 and 2250; COSC 1030 or 3070.

**4550. Introduction to Artificial Intelligence. 3.**

A computational study of intelligent behavior. Focus is on intelligent agents, which could be software agents or robots. Covers how agents sense, reason, and act within their environment. Includes problem-solving, search, knowledge representation, planning, game playing, learning, and neural and belief networks. Dual listed with COSC 5550. *Prerequisites:* COSC 3020.

**4555. Machine Learning. 3.**

Goal is to program machines to learn and improve their performance on their own, based on experience and/or data. First half covers machine learning techniques; second half covers applications. Dual listed with COSC 5555. *Prerequisite:* COSC 3020.

**4560. Modern Robots and Softbots. 3.**

Popular agent designs: logic-based, biomimetic, and physicomimetic. Foundational issues on internal robot and softbot knowledge representations. Planning and control, followed by issues of how agents can reason and plan under real-world conditions of environmental uncertainty. Concludes with discussions about papers on modern robot and softbot applications, as well as invited lectures by graduate students and faculty. Dual listed with COSC 5560.

**4570. Data Mining. 3.** Examine methods that have emerged from artificial intelligence and statistics and proven to be of value in recognizing patterns and making predictions with large data sets. Will include both theory and practice while developing several projects. *Prerequisite:* COSC 4550.

**4730. Mobile Application Programming. 3.** Introduces development of applications on mobile devices. Presents the principles, techniques, and tools for developing mobile applications. Differences between desktop applications and mobile applications are discussed. Dual listed with COSC 5730. *Prerequisite:* COSC 3020.

**4740. Operating Systems Design. 4.** Studies systems programming languages and computer systems design. Includes interacting processes, main storage management, procedure and data sharing, scheduling, deadlock problems and file management in batch processing and multi-programming systems. Operating system implementation. *Prerequisite:* COSC 3020.

**4750. Systems Programming and Management. 3.** Comparatively studies features found in commercial and experimental operating systems. Discusses issues in system-level programming and administration, including shell programming, file management, resource control, configuration and security. Advanced topics include multiprocessor and real-time operating systems. *Prerequisites:* COSC 2030.

**4755. Network Applications. 3.** Introduces the structure, implementation, and theoretical underpinnings of computer networking and the applications that have been enabled by that technology. Dual listed with COSC 5755. *Prerequisite:* COSC 3020.

**4760. Computer Networks. 3.** Examines TCP/IP network protocols and implementation in depth, from the perspective of the link, network, transport, and application layers. Discusses problems and current solutions regarding the efficient use of network resources in the global, multi-media internet. *Prerequisite:* COSC 2030.

**4765. Computer Security. 3.** Introduces the topics of computer and network security and provides a foundation to allow students to identify, analyze, and solve computer security problems. *Prerequisite:* COSC 3020.

**4780. Principles of Programming Languages. 3.** Introduces the methods of analysis and design of programming languages. Covers syntax, typing schemes and the semantics (denotational and operations) in the context of functional and imperative programming languages. Students build interpreters to explore the implications of the different constructs on computations. *Prerequisites:* COSC 3015.

**4785. Compiler Construction 1. 3.** Theory and implementation of interpreters and compilers. Compiler topics include lexical analysis, top-down and bottom-up parsing methods, symbol tables, and code generation from a block-structured language with recursion and parameters. Project uses compiler writing tools. Dual listed with COSC 5785. *Prerequisite:* COSC 3020.

**4790. Programming Language Processors. 3.** Discusses principles and design aspects of programming language processors, including interpreters and compilers. Emphasizes components of compiled system, such as scanner, parser, symbol table, code generation, optimization, linking and loading. Uses compiler generation tools. *Prerequisite:* COSC 4780.

**4820. Database Systems. 3.** Provides comprehensive coverage of the problems involved in database design, in-depth coverage of data models and database languages. Students acquire practical skills of conceptual/logical database design and general familiarity with the problems and issues of database management. *Prerequisite:* COSC 3020.

**4840. Software Engineering. 3.** Extends the ideas of software design and development from the introductory programming sequence to encompass the problems encountered in large-scale programs. Topics include software engineering techniques from the technical and managerial perspectives, with a strong emphasis on software design. *Prerequisites:* COSC 3020 and 3011.

**4950. Senior Design I. 1.** Students choose a senior design project, investigate alternate solutions and submit a preliminary project design. Periodic oral and written project progress reports are required. *Prerequisite:* COSC 3011 and COSC 3020.

**4955. Senior Design II. 2.** Students complete the senior design project partially designed in COSC 4950. Successful communication of the details of the solution through written documents and oral presentations will be required. *Prerequisite:* COSC 4950.

**5000. Seminar in Computer Science. 1-3. (Max. 10).** One or more current research areas in computer science are investigated. *Prerequisite:* consent of instructor.

**5010. Graduate Topics in Computer Science. 1-6 (Max. 12).** Individual or small group pursuit of computer science research areas. (Max. of 12 hours from COSC 4010 and COSC 5010 may be applied to graduate study). *Prerequisites:* graduate standing and consent of instructor.

**5020. Advanced Topics in Computer Science. 1-6 (Max. 12).** Advanced topics in computer science. (A maximum of 12 hours may be applied to graduate study.) *Prerequisites:* graduate standing and consent of instructor.

**5050. Research Writing in Computer Science. 3.** Instruction in methods for performing and reporting research in the field of computer science. The primary task is preparation of a research paper; to that end, the class covers how to collect and analyze previously published work, generate and develop a research topic, and present research results in acceptable written form. *Prerequisite:* graduate standing, consent of instructor.

**5110. Analysis Of Algorithms. 3.** Analysis of algorithms to determine their time and space requirements. Beginning with data structures such as lists, stacks, trees, and sets and their implementations. The class then analyzes specific algorithms for internal sorting, hashing, and string search. Offered fall semester of even numbered years. *Prerequisites:* COSC 3020 or equivalent and consent of the department.

**5120. Theory Of Computation. 3.** Models of computation, the Church-Turing thesis, computable functions, decidable and enumerable sets, unsolvable problems, correctness of programs, and complexity of computation. The theory of computation provides precise answers to the fundamental questions of computer science: Which problems can be solved by machine computation and which can be solved using a reasonable amount of computer resources. *Prerequisite:* COSC 4100.

**5200. Computational Complexity. 3.** Study of efficient computation and computational intracability. Time and space complexity; P, NP, and the polynomial-time hierarchy; reductions and completeness; randomized complexity; non-uniform complexity; approximation algorithms and inapproximability. *Prerequisite:* COSC 4100 or COSC 4200.

**5220. Languages and Automata. 3.** The study of regular, context-free, and context-sensitive languages and their relations to finite-state, pushdown and linear-bounded automata. Context-free language recognition. The halting problem and decidability results. *Prerequisite:* COSC 4100.

**5310. Computational Methods in Applied Sciences I. 3.** First semester of a three-semester computational methods series. Review of iterative solutions of linear and nonlinear systems of equations, polynomial interpolation/approximation, numerical integration and differentiation, and basic ideas of Monte Carlo methods. Comparison of numerical techniques for programming time and space requirements,

as well as convergence and stability. Cross listed with MATH 5310. *Prerequisites:* MATH 3310, COSC 1010.

**5340. Computational Methods in Applied Sciences II. 3.** Second semester of a three-semester computational methods series with emphasis on numerical solution of differential equations. Topics include explicit and implicit methods, methods for stiff ODE problems, finite difference, finite volume and finite element methods for time-independence PDEs, semi/fully discrete methods for time-dependent PDEs. Cross listed with MATH 5340. *Prerequisite:* MATH/COSC 5310.

**5345. Computational Methods in Applied Sciences III. 3.** Third semester of a three-semester computational methods series with emphasis on numerical solution of problems displaying sharp fronts and interfaces (non-linear conservation laws, Hamilton-Jacobi equations. Cross listed with MATH 5345. *Prerequisite:* MATH/COSC 5340.

**5350. System Simulation. 3.** Introduces simulation and comparison with other techniques. Studies discrete simulation models, and introduction to, or review of, queuing theory and stochastic processes. Compares discrete change simulation languages. Examines simulation methodology including generation of random numbers and variates, design of simulation experiments for optimization, analysis of data generated by simulation models and results. Selected applications of simulation. Dual listed with COSC 4350. *Prerequisite:* COSC 3020, MATH 4250 or STAT 2010. Additional work is assigned for those enrolled for graduate credit.

**5420. Advanced Logic. 3.** Studies advanced topics in mathematical logic. Takes up such topics as: uninterpreted calculi and the distinctive contributions of syntax and semantics; metatheory, including completeness and consistency proofs; modal logic and semantics; logic as a philosophical tool. Dual listed with COSC 4420; cross listed with COSC/MATH 5420. *Prerequisite:* PHIL 3420 or equivalent; graduate standing.

**5450. Computer Graphics. 3.** Introduction to computer graphics, an increasingly important area of computer science. Computer graphics, together with multimedia and the world-wide web, offers exciting new possibilities for the design of human-computer interfaces. Presents the principles, techniques, and tools that enable these advances. Dual listed with COSC 4450. *Prerequisites:* COSC 3020, MATH 2250.

**5540. Computer Vision. 3.** Provides students with an understanding of applying computer methodologies to process two-dimensional

and three-dimensional images. Primary areas of investigation are image preprocessing, knowledge representation, pattern recognition and motion understanding. *Prerequisites:* COSC 3020, MATH 2205, MATH 2250.

**5550. Introduction to Artificial Intelligence. 3.** A computational study of intelligent behavior. The focus is on intelligent agents, which could be software agents or robots. Covers how agents sense, reason, and act within their environment. Includes problem-solving, search, knowledge representation, planning, game playing, learning, and neural and belief networks. Dual listed with COSC 4550. *Prerequisite:* COSC 3020.

**5555. Machine Learning. 3.** To program machines to learn and improve their performance on their own, based on experience and/or data. The first part covers machine learning techniques. The second part covers applications. Dual listed with COSC 4555. *Prerequisite:* COSC 3020.

**5560. Modern Robots and Softbots. 3.** Begins with a presentation of popular agent designs: logic-based, biomimetic, and physicomimetic. Presents foundational issues on internal robot and softbot knowledge representations. Planning and control are then covered, followed by issues of how agents can reason and plan under real-world conditions of environmental uncertainty. Concludes with discussions about papers on modern robot and softbot applications, as well as invited lectures by graduate students and faculty in the UW COSC and ECE departments. Dual listed with COSC 4560.

**5640. Automated Reasoning. 3.** Study of programs, such as automated theorem provers, which require the use of “intelligence” to solve problems. Topics include resolution, unification, proof strategies, induction based theorem provers, expert systems, and Prolog. *Prerequisite:* COSC 4100.

**5700. Computer Architecture. 3.** A study of the interaction between computing and computer architecture. Memory hierarchies: segmentation, paging, and caches. CPU organizations: pipelining, array processors, parallelism. IO: channels, DMA, auxiliary CPU's. Interprocessor communication in multi-CPU systems. *Prerequisites:* COSC 4740 and 4700.

**5730. Mobile Application Programming. 3.** Introduces development of applications on mobile devices. Presents the principles, techniques, and tools for developing mobile applications. Differences between desktop applications and mobile applications are discussed. Dual listed with COSC 4730. *Prerequisite:* COSC 3020.

**5740. Advanced Operating Systems. 3.** Advanced course in operating systems design and implementation. Emphasis on multiprocessing and distributed systems and study of mechanisms for their control. Topics include concurrency control, deadlock memory management, security, and reliability. *Prerequisite:* COSC 4740.

**5750. Distributed Computing Systems. 3.** Provides an in-depth study of distributed computing systems, including both architecture and software issues. Topics include concepts of distributed computing, communication primitives, distributed operating systems, distributed file management, and distributed programming languages. Particular attention is paid to modeling and analysis of distributed systems and algorithms. Programming projects and research papers are assigned. *Prerequisite:* COSC 5740.

**5755. Network Applications. 3.** Introduces the structure, implementation, and theoretical underpinnings of computer networking and the applications that have been enabled by that technology. Dual listed with COSC 4755. *Prerequisite:* COSC 3020.

**5785. Compiler Construction I. 3.** Theory and implementation of interpreters and compilers. Compiler topics include lexical analysis, top-down and bottom-up parsing methods, symbol tables, and code generation for a block-structured language with recursion and parameters. Project uses compiler writing tools. Dual listed with COSC 4785. *Prerequisite:* COSC 3020.

**5790. Compiler Construction II. 3.** Advanced topics concerning the front end of a programming language compiler, the description and implementation of features found in the back end of a compiler, and the run time environment. Topics include data type checking, global data flow analysis, flow graph reduction, local and global code optimization, and code generation. Reports on recent research papers. *Prerequisite:* COSC 4785 or 5785.

**5820. Database Systems. 3.** Provides comprehensive coverage of the problems involved in database design, in-depth coverage of data models and database languages. Students acquire practical skills of conceptual/logical database design and general familiarity with the problems and issues of database management. *Prerequisite:* COSC 3020.

**5825. Advance Data Systems. 3.** Provides comprehensive coverage of the problems involved in database system design and an in-depth examination of contemporary structures and techniques used in modern database management systems and database applications. *Prerequisite:* COSC 4820.

**5840. Software Engineering Management.**

3. Management issues in the development of software systems. Topics include planning documentation for requirements, design, implementation and testing, cost projection and modeling, documentation standards, code control, tracking of defects, management psychology, group interaction and communication, and the management of reviews and walk through. *Prerequisites:* COSC 4740, 4780 or equivalent and consent of the department.

**5850. Software Management Laboratory.**

3. Laboratory course designed to illustrate the principles discussed in COSC 5840. Students are team leaders on a project which involves the integration, testing, and maintenance of a large software system. The project is the same as that used for COSC 4850. *Prerequisite:* COSC 5840.

**5880. Software Verification and Validation.**

3. Concepts and practices for assuring the quality of software systems. Covers test planning, operational testing, formal verification, proofs of correctness, and validation testing. *Prerequisite:* COSC 3020 or COSC 4050.

**5900. Practicum in College Teaching. 1-3**

(Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2. (Max 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-16 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 3).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrollment in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisites:* enrollment in a graduate level degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Department of Electrical and Computer Engineering

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Web site: [www.eng.uwyo.edu/electrical](http://www.eng.uwyo.edu/electrical)

Department Head: John McInroy

**Professors:**

**STEVEN F. BARRETT**, B.S. University of Nebraska 1979; M.E. University of Idaho 1986; Ph.D. University of Texas 1993; Professor of Electrical Engineering 2011, 1999.

**JERRY C. HAMANN**, B.S. University of Wyoming 1984; M.S. 1988; Ph.D. University of Wisconsin-Madison 1993; Professor of Electrical Engineering 2009, 1993.

**STANISLAW F. LEGOWSKI**, M.Sc. Technical University of Gdansk, Poland 1962; Ph.D. 1971; Professor of Electrical Engineering 1993, 1983.

**JOHN E. MCINROY**, B.S. University of Wyoming 1986; M.S. Rensselaer Polytechnic Institute 1988; Ph.D. 1991; Professor of Electrical Engineering 2002, 1991.

**SURESH S. MUKNAHALLIPATNA**, B.E. University of Bangalore, India 1988; M.E. 1991; Ph.D. University of Wyoming 1995; Professor of Electrical Engineering 2010, 1997.

**JOHN W. PIERRE**, B.S. Montana State University 1986; M.S. University of Minnesota 1989; Ph.D. 1991; Professor of Electrical Engineering 2002, 1991.

**DAVID L. WHITMAN**, B.S. University of Wyoming 1975; Ph.D. 1978; Professor 1991, 1981.

**Associate Professors:**

**EVA S. FERRE-PIKAL**, B.S. University of Puerto Rico 1988; M.S. University of Michigan 1989; Ph.D. University of Colorado 1996; Associate Professor of Electrical Engineering 2004, 1998.

**ROBERT F. KUBICHEK**, B.S.C.S., B.S.E.E. University of Wyoming 1976; M.S. 1977; Ph.D. 1985; Associate Professor of Electrical Engineering 1997, 1991.

**JOHN F. O'BRIEN**, B.S. California State Polytechnic University, Pomona 1991; M.S. University of Wyoming 1997; Ph.D. Rensselaer Polytechnic Institute 2001; Associate Professor of Electrical Engineering 2009, 2003.

**JON M. PIKAL**, B.S. Purdue University 1988; M.S. University of Colorado 1993; Ph.D. Colorado State University 1999; Associate Professor of Electrical Engineering 2005, 1999.

**CAMERON H.G. WRIGHT**, B.S. Louisiana Tech University 1983; M.S. Purdue University 1988; Ph.D. University of Texas 1996; Associate Professor of Electrical Engineering 2008, 2003.

**Assistant Professors:**

**DONGLIANG DUAN**, B.E. Huazhong University of Science and Technology 2006; M.S. University of Florida 2009; Ph.D. Colorado State University 2012; Assistant Professor of Electrical Engineering 2012.

**DOMEN NOVAK**, M.Sc. University of Ljubljana 2008; Ph.D. 2011; Assistant Professor of Electrical Engineering 2014.

**Academic Professional:**

**JEFFREY R. ANDERSON**, B.S.E.E. University of Utah 1989; M.S.E.E 1992; Ph.D. University of Wyoming 2004; Associate Academic Professional Lecturer in Electrical and Computer Engineering 2012.

**Adjunct Faculty:**

Farhad Jafari, Elena Oggero, Guido Pagnacco, and Margaret Stefanovic.

**Instructor:**

Yelena V. O'Brien

**Professors Emeriti:**

Christos T. Constantinides, Jerry J. Cupal, Clifford D. Ferris, Raymond G. Jacquot, John W. Steadman, A.H.M. Sadrul Ula

## Electrical Engineering

The program of study outlined in the curriculum has been planned to provide the depth of understanding necessary to meet challenges of changing technology while being flexible enough to allow students to pursue in-depth study in at least one area of electrical engineering. In order to attain this, students are required to gain an understanding of mathematics and the basic engineering sciences. The fundamental electrical engineering education consists of courses in circuits, networks, electromagnetics, electronics, digital systems, communications, controls and energy conversion. Selection of elective courses, in consultation with the academic adviser, enables students to specialize in the above mentioned areas, as well as in robotics, microcircuits, microprocessors and high frequency electronics.

Laboratory work associated with electrical engineering courses is an important part of the curricula. This work helps students gain experience in applying the theoretical knowledge they acquire to practical engineering problems. Engineering design is an important compo-

ment of the curriculum that concludes with a significant design experience in the senior year. Additional programs are described below.

**F.M. Long Bioengineering Option.** Named in honor of UW Professor Francis M. Long, this area offers excellent opportunities for those interested in applying the techniques of the electronic engineer to problems of environmental science, biology and medicine. Employment opportunities exist in state and federal agencies, industry and medical institutions. Career placement includes such areas as environmental monitoring, design and development of biological and medical instrumentation and clinical engineering. With minor modifications, the curriculum shown may be used as preparation for entrance to medical or dental school.

### Computer Engineering

Very rapid advances in semiconductor technology have made sophisticated digital devices available as an engineering tool. The computer engineering degree program is designed for those students who want a special emphasis in both the hardware and software associated with incorporating digital devices and microprocessors into various products and systems. It includes courses in computer science and electrical engineering for both software and hardware design. Extensive laboratory work gives students experience with wired logic and microprogrammed digital systems, microprocessors, personal computers, hardware descriptive language, and computer networks.

### International Engineering Option

Engineering is a global profession and today's engineers must be able to work and interact in a variety of diverse cultural and technical environments. The international engineering option gives electrical and computer engineering students an opportunity to study culture and foreign language at the same time as they pursue their engineering degrees.

The option includes at least one semester of study abroad with courses taken in a foreign language. In addition, students may participate in a four-to-five month international internship. Foreign language skills can be earned through a variety of means, including formal university coursework, intensive summer language programs, and previous education.

Foreign language education and the study-abroad experience satisfies the cultural context requirements of the 2013 University Studies Program or the Human Culture (H) requirement of the 2015 University Studies Program.

### Graduate Program

The department offers programs of study leading to the Master of Science and Doctor of Philosophy degrees in electrical engineering. Study programs are individually planned to students' interests in both course work and research.

### Grade Policy

Electrical and computer engineering majors must achieve a grade of C (2.0) or better on courses that are prerequisites for courses within the student's course of study. Students must also achieve a grade of C (2.0) or better in all required mathematics courses.

### Concurrent Major and Minor

The department offers a concurrent major and minor in both the electrical engineering and computer engineering programs. Consult the department office for a current detailed list of requirements.

### Combined BS/MS Degree

The combined BS/MS program in Electrical and Computer Engineering enables especially well-qualified students to be admitted to the MS program during the junior year of their BS program and to work thereafter towards both the BS and MS degrees. These students would earn the BS degree in either Electrical Engineering or Computer Engineering and the MS degree in Electrical Engineering following the current curricula. This program allows for early planning of the MS portion of the student's education, taking graduate courses as part of the BS degree, more flexibility in the order in which courses are taken, and more efficient use of what would otherwise be a final semester with a light credit hour load.

### Program Educational Objectives for Electrical and Computer Engineering

Graduates of the University of Wyoming Electrical and Computer Engineering Program will:

- Be able to successfully practice the profession of Electrical or Computer Engineering.

- Be prepared and motivated to accept challenging assignments and responsibilities and be productive members of society.
- Demonstrate successful career growth (e.g., professional registration, graduate school, promotion and advancement, patents, publications).

### University of Wyoming, Electrical and Computer Engineering Program, Student Outcomes

All Electrical (Computer) Engineering graduates shall demonstrate:

- (a) an ability to apply knowledge of mathematics, science, and engineering
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data
- (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- (d) an ability to function on multidisciplinary teams
- (e) an ability to identify, formulate, and solve engineering problems
- (f) an understanding of professional and ethical responsibility
- (g) an ability to communicate effectively
- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- (i) a recognition of the need for, and an ability to engage in life-long learning
- (j) a knowledge of contemporary issues
- (k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

### Electrical Engineering Curriculum<sup>1</sup>

*Suggested Course Sequence*

FRESHMAN YEAR: Fall		Hrs.
CHEM	1020.....	4
ENGL	1010.....	3
ES	1060 <sup>2</sup> .....	3
First-Year Seminar (FYS).....		3
MATH	2200.....	4
<b>Total Hrs.</b>		<b>17</b>

<b>FRESHMAN YEAR: Spring</b>		<b>Hrs.</b>
EE	1010	1
ES	2110	3
MATH	2205	4
MATH	2250	3
PHYS	1210 <sup>3</sup>	3
<b>Total Hrs.</b>		<b>15</b>

<b>SOPHOMORE YEAR: Fall</b>		<b>Hrs.</b>
ES	2120	3
ES	2210	3
MATH	2210	4
PHYS	1220 <sup>3</sup>	4
Human Culture (H)		3
<b>Total Hrs.</b>		<b>17</b>

<b>SOPHOMORE YEAR: Spring</b>		<b>Hrs.</b>
EE	2220	4
EE	2390	4
MATH	2310	3
Human Culture (H)		3
Science/Math Elective <sup>4</sup>		3
<b>Total Hrs.</b>		<b>17</b>

<b>JUNIOR YEAR: Fall</b>		<b>Hrs.</b>
EE	3150	3
EE	3220	3
EE	3310	4
EE	3510	4
Communication II (COM2)		3
<b>Total Hrs.</b>		<b>17</b>

<b>JUNIOR YEAR: Spring</b>		<b>Hrs.</b>
EE	3330	4
EE	4075	4
EE	4220	3
EE	4390	3
EE	4620	3
<b>Total Hrs.</b>		<b>17</b>

<b>SENIOR YEAR: Fall</b>		<b>Hrs.</b>
EE	4440	3
EE	4820	2
ENGL	4010	3
EE Elective <sup>5</sup>		3
EE Elective <sup>5</sup>		3
EE Elective <sup>5</sup>		3
<b>Total Hrs.</b>		<b>17</b>

<b>SENIOR YEAR: Spring</b>		<b>Hrs.</b>
EE	4830	2
U.S. & Wyoming Constitutions (V)		3
EE Elective <sup>5</sup>		3
EE Elective <sup>5</sup>		3
EE Elective <sup>5</sup>		3
Technical Elective <sup>6</sup>		3
<b>Total Hrs.</b>		<b>17</b>
<i>Total Credit Hours</i>		<i>132</i>

(1) Students must have a minimum cumulative GPA 2.0 in all Engineering courses for graduation. GPA of 2.0 or higher is required for all prerequisite courses. Students must complete a minimum of 42 hours of upper division coursework, 30 of which must be from the University of Wyoming.

(2) EE 1010 may be replaced with technical elective if transfer credits > 30 hours.

(3) PHYS 1210: no credit can be earned in PHYS 1210 if taken after ES 2120. PHYS 1220 should be taken before or concurrently with ES 2210.

(4) One course from the ECE Math/Science Elective List. ABET requires a minimum of 32 hours of Math/Science Electives.

(5) A minimum of 19 hours of EE electives is required. A minimum of 16 credit hours of non-required courses.

(6) Any course in Engineering, Computer Science, or those marked as technical electives in the ECE Math/Science Elective List.

### F.M. Long Bioengineering Curriculum<sup>1</sup>

#### *Suggested Course Sequence*

<b>FRESHMAN YEAR: Fall</b>		<b>Hrs.</b>
CHEM	1020	4
ENGL	1010	3
ES	1060	3
First-Year Seminar (FYS)		3
MATH	2200	4
<b>Total Hrs.</b>		<b>17</b>

<b>FRESHMAN YEAR: Spring</b>		<b>Hrs.</b>
CHEM	2300	4
EE	1010 <sup>2</sup>	1
ES	2110	3
MATH	2205	4
PHYS	1210 <sup>3</sup>	4
<b>Total Hrs.</b>		<b>16</b>

<b>SOPHOMORE YEAR: Fall</b>		<b>Hrs.</b>
ES	2120	3
ES	2210	3
MATH	2210	4
PHYS	1220 <sup>3</sup>	4
Human Culture (H)		3
<b>Total Hrs.</b>		<b>17</b>

<b>SOPHOMORE YEAR: Spring</b>		<b>Hrs.</b>
EE	2220	4
EE	2390	4
LIFE	1010	4
MATH	2250	3
MATH	2310	3
<b>Total Hrs.</b>		<b>18</b>

<b>JUNIOR YEAR: Fall</b>		<b>Hrs.</b>
EE	3220	3
EE	3310	4
EE	3510	4
Communication II (COM2)		3
Human Culture (H)		3
<b>Total Hrs.</b>		<b>17</b>

<b>JUNIOR YEAR: Spring</b>		<b>Hrs.</b>
EE	3330	4
EE	4075	4
EE	4390	3
ENGL	4010	3
MOLB	2021	4
<b>Total Hrs.</b>		<b>18</b>

<b>SENIOR YEAR: Fall</b>		<b>Hrs.</b>
BE 4810 or EE 4330		3
EE	3150	3
EE	4220	3
EE	4820	2
EE <sup>4</sup> or Technical Elective <sup>5</sup>		3
<b>Total Hrs.</b>		<b>15</b>

<b>SENIOR YEAR: Spring</b>		<b>Hrs.</b>
BE 4820 or EE 4620		3
EE	4830	2
MOLB	3610	4
EE <sup>4</sup> or Technical Elective <sup>5</sup>		3
U.S. & WY Constitutions (V)		3
<b>Total Hrs.</b>		<b>15</b>
<i>Total Credit Hours</i>		<i>132</i>

(1) Students must have a minimum cumulative GPA 2.0 in all Engineering courses for graduation. GPA of 2.0 or higher is required for all prerequisite courses. Students must complete a minimum of 42 hours of upper division coursework, 30 of which must be from the University of Wyoming.

(2) EE 1010 may be replaced with technical elective if transfer credits > 30 hours.

(3) PHYS 1210: no credit can be earned in PHYS 1210 if taken after ES 2120. PHYS 1220 should be taken before or concurrently with ES 2210.

(4) Any non-required EE courses.

(5) Any course in Engineering, Computer Science, or those marked as technical electives in the ECE Math/Science Elective List.

### Computer Engineering Curriculum<sup>1</sup>

#### *Suggested Course Sequence*

<b>FRESHMAN YEAR: Fall</b>		<b>Hrs.</b>
CHEM	1020	4
COSC	1010	4
ENGL	1010	3
First-Year Seminar (FYS)		3
MATH	2200	4
<b>Total Hrs.</b>		<b>18</b>

<b>FRESHMAN YEAR: Spring</b>		<b>Hrs.</b>
COSC	1030	4
EE	1010 <sup>2</sup>	1
ES	2110	3
MATH	2205	4
ES	2110	3
PHYS	1210 <sup>3</sup>	4
<b>Total Hrs.</b>		<b>16</b>

<b>SOPHOMORE YEAR: Fall</b>		<b>Hrs.</b>
COSC	2030.....	4
ES	2120.....	3
ES	2210.....	3
MATH	2210.....	4
PHYS	1220.....	4
<b>Total Hrs.</b>		<b>18</b>

<b>SOPHOMORE YEAR: Spring</b>		<b>Hrs.</b>
COSC	2150.....	3
EE	2220.....	4
EE	2390.....	4
MATH	2300.....	3
MATH	2310.....	3
<b>Total Hrs.</b>		<b>17</b>

<b>JUNIOR YEAR: Fall</b>		<b>Hrs.</b>
EE	3220.....	3
EE	3330.....	4
EE	4490.....	3
Communication II (COM2)	.....	3
Human Culture (H)	.....	3
<b>Total Hrs.</b>		<b>16</b>

<b>JUNIOR YEAR: Spring</b>		<b>Hrs.</b>
EE	3150.....	3
EE	3330.....	4
EE	4390.....	3
Math/Science Elective <sup>4</sup>	.....	3
Human Culture (H)	.....	3
<b>Total Hrs.</b>		<b>16</b>

<b>SENIOR YEAR: Fall</b>		<b>Hrs.</b>
ENGL	4010.....	3
EE	4220.....	3
EE	4820.....	2
EE 4870 or COSC 4760	.....	4
EE/COSC Elective <sup>5</sup>	.....	3
U.S. & WY Constitutions (V)	.....	3
<b>Total Hrs.</b>		<b>18</b>

<b>SENIOR YEAR: Spring</b>		<b>Hrs.</b>
EE	4820.....	2
CPEN Option Course <sup>6</sup>	.....	3
CPEN Option Course <sup>6</sup>	.....	3
EE/COSC Elective <sup>5</sup>	.....	3
EE/COSC Elective <sup>5</sup>	.....	3
<b>Total Hrs.</b>		<b>14</b>
<i>Total Credit Hours</i>		<i>132</i>

(1) Students must have a minimum cumulative GPA 2.0 in all Engineering courses for graduation. GPA of 2.0 or higher is required for all prerequisite courses. Students must complete a minimum of 42 hours of upper division coursework, 30 of which must from the University of Wyoming.

(2) EE 1010 may be replaced with technical elective if transfer credits > 30 hours.

(3) PHYS 1210: no credit can be earned in PHYS 1210 if taken after ES 2120. PHYS 1220 should be taken before or concurrently with ES 2210.

(4) One course from the ECE Math/Science Elective List. ABET requires a minimum of 32 hours of Math/Science Electives.

(5) A minimum of 19 hours are required. Courses can be any non-required EE or COSC courses.

(5) CPEN Option Courses (complete any two): EE 4245, 4235, 4360, 4530, 4590, 4870, 4970, 4990, 5410, 5630, 5650; COSC 3020, 4550, 4560, 4740, 4760, 4840.

## Graduate Study

The department offers programs of study leading to the degrees of Master of Science and Doctor of Philosophy in electrical engineering. The areas of major concentration at the graduate level are:

- Bio-Engineering
- Controls
- Electrical Energy Systems
- Electronic Systems and Devices
- Robotics
- Signal Processing and Computer Networks

The department also offers a combined B.S./M.S. program for exceptional students wishing to obtain both degrees in a shorter period of time.

## Program Specific Admission Requirements

Statement of purpose

Official transcripts from all post-secondary institutions attended

GRE verbal percentile minimum of 40 percent. GRE quantitative percentile minimum of 65 percent.

TOEFL total of 79 iBT or IELTS total 6.5.

## Program Specific Graduate Assistantships

Additionally, all international students who are state-funded teaching assistantships or any international student with teaching responsibilities are required to complete an Oral Proficiency Interview (OPI). Students will need to follow the recommendations to improve their English skills. Students on state-funding who fail to follow the recommendations or do not meet the minimum proficiency by the end of their first semester will not be able to receive any state-funding until they have demonstrated proficiency.

## Program Specific Degree Requirements

### Master's Programs

#### Plan A (thesis)

This is a minimum 30 credit hour program, 26 hours coursework and 4 hours of thesis

16 credit hours (minimum) in ECE formal coursework

3 credit hours (minimum) in formal coursework outside the department and approved by the student's committee  
7 additional credit hours in or out of the department with committee approval  
4 or more credit hours of M.S. thesis research

Of the above credit hours in formal coursework, no more than 12 credit hours can be 4000 level

The candidate must meet the minimum requirements for the Master of Science degree and also complete and defend a master's thesis.

#### Plan B (non-thesis)

This is a 30 hour program:

18 (minimum) in ECE formal coursework  
3 (minimum) in formal coursework outside the department and approved by the student's committee

9 additional credits in or out of the department with committee approval

Of the above credit hours in formal coursework, no more than 12 can be 4000 level.

The candidate must meet the minimum requirements for the master of science degree and complete a plan B project. Satisfying the "Plan B project" can be completed in one of the following ways:

Complete a project for a 5000-level EE course, including a class presentation

Complete an independent project under EE 5880 (up to three credit hours), including a presentation

#### Quick Start BS/MS Program

The combined B.S./M.S. program 1n electrical and computer engineering enables especially well-qualified students to be admitted to the M.S. program during the junior year of their B.S. program, and to work thereafter towards both the B.S. and M.S. degrees. These students would earn the B.S. in either electrical engineering or computer engineering and the M.S. degree in electrical engineering following the current curricula.

This program allows for early planning of the M.S. portion of the student's education, taking graduate courses as part of the B.S. degree, more flexibility in the order in which courses are taken, and more efficient use of what would otherwise be a final semester with a light credit hour load.

Up to 6 credit hours from UW, at the 5000-level or above, may be counted toward both the B.S. and M.S. degree programs.

For further information please visit our Web site at <http://www.uwyo.edu/electrical/graduate/prospective/ms/quickstart.html>.

### Doctoral Program

Ph.D. Degree Requirements:

Ph.D. Credit Allocation (all at 4000 level minimum)

72 hours (minimum) of acceptable graduate coursework

42 hours (minimum) from ECE and closely related formal course work (EE 5980: Dissertation Research not counting toward this minimum)

Of those 42 hours, no more than 12 hours can be at the 4000 level

Courses required by the department bachelor of science degree may not be applied for graduate credit

6 hours (maximum) of EE 4800 (Problems in ...) can be counted for program of study credit

6 hours (maximum) of EE 5880 (Problems in ...) can be counted for program of study credit

9 hours (maximum) of EE 5600 (Statistical Signal Processing in ...) can be counted for program of study credit

In addition to the minimum requirements of the university, doctoral students must pass a written and oral comprehensive examination, part of which is a written proposal explaining their planned dissertation research. The student must also present and defend a completed dissertation. Programs of study, including coursework and any research tools, are arranged by consultation between the students and their graduate committee.

## Electrical Engineering (EE)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**1010. Introduction to Electrical and Computer Engineering. 1.** Introduction to Electrical and Computer Engineering through a laboratory experience. Students perform both hardware and computer laboratory exercises in a wide range of areas of electrical and computer engineering.

**2220 [3320]. Circuits and Signals. 4.** Review of sinusoidal steady state analysis and ac power. Mutual inductance and linear transformers. Laplace transform. Laplace transform in circuit analysis. Frequency dependent circuits, including RLC circuit resonance. Magnitude

and phase response, complex poles and zeros. Bode plots. Filter circuit fundamentals. Fourier series. Laboratory. *Prerequisite:* ES 2210.

**2390. Digital Systems Design. 4.** Binary logic, digital logic gates, reduction of Boolean expressions, combinational logic design. MSI and LSI combinational logic ICs, flip-flops, synchronous and asynchronous sequential systems design, MSI and LSI sequential system ICs, and algorithmic state machines. *Prerequisite:* MATH 2205. (Offered both semesters)

**3150. Electromagnetics. 3.** A thorough study of static electric and magnetic fields using vector methods with an introduction to dynamic fields. *Prerequisites:* ES 2210 and MATH 2210.

**3220. Signals And Systems. 3.** Discrete and continuous-time signals and systems. Topics include linear time-invariant systems; convolution; difference equations; FIR and IIR systems; sampling, aliasing, reconstruction, and quantization. Frequency domain concepts include discrete and continuous Fourier transforms, Z-transforms, system frequency response, Laplace transform properties, and applications of digital filters and DFT analysis. *Prerequisite:* EE 2220.

**3310. Electronics I. 4.** Physical characteristics and models of semiconductor devices with application to electronic circuit design. Diode circuits, single transistor amplifiers, biasing, and load lines. Laboratory. *Prerequisites:* EE 2220, PHYS 1220 or PHYS 1320. (Offered both semesters)

**3330. Electronics II. 4.** Current sources, differential and multistage amplifiers; circuits with ideal and non-ideal operational amplifiers; low and high band frequency response, feedback, stability, gain and phase margin of amplifiers; output stages, class A and push-pull; monolithic operational amplifier; oscillators; transistors as switches and introduction to digital electronic circuits. Laboratory. *Prerequisite:* EE 3310.

**3510. Electromechanics. 4.** Polyphase circuits; ferromagnetic circuits and devices; single phase and polyphase transformers; basic electromechanical energy conversion; steady state characteristics and application of DC machines, AC synchronous and induction machines; fractional-horsepower AC motors. Includes laboratory. *Prerequisite:* EE 2220.

**4075 [ES 3075]. C++ with Numerical Methods for Engineers. 4.** Introduction to the fundamentals of practical engineering programming, using specific applications of numerical methods to demonstrate these principles. The use of an object oriented approach using C++ in an efficient manner is emphasized. Other solution approaches, including C and Matlab will be discussed as appropriate. Credit will

not be allowed in both EE 4075 and ES 3070. *Prerequisites:* MATH 2205 and (COS 1010 or ES 1060) and (MATH 2250 or MATH 2310).

**4220. Probabilistic Signals and Systems. 3.** Fundamentals of probability and statistics for engineers; reliability in engineering systems; random processes, statistical estimation, auto/cross correlation and power spectral density functions and linear filtering of random signals. *Prerequisite:* EE 3220.

**4245. Digital Signal Processing. 3.** Sampling and oversampling A/D's; FIR and IIR digital filter design, effects of quantization, practical realizations; applications of the discrete and fast Fourier Transform (DFT and FFT); correlation, periodograms, window effects, multi-rate techniques, multi-dimensional signal processing, and other topics in digital signal processing. *Prerequisite:* EE 3220.

**4250. Network Synthesis. 3.** Characterization and design specification of analog filters. First and second order passive and active filters. Butterworth and Chebyshev filter responses. Audio frequency active filter synthesis using operational amplifiers. Introduction to frequency transformations and sensitivity. *Prerequisites:* EE 2220 and 3330 or concurrent enrollment.

**4300. Introduction to Microwave and RF Circuits. 3.** Analysis and design of microwave and RF circuits with applications to communication and radar systems. Review of transmission line concepts and the Smith Chart, scattering parameters, microstrip lines, and matching networks. Analysis and design of microwave and RF amplifiers, oscillators, and mixers. Dual listed with EE 5300. *Prerequisite:* EE 3150, concurrent enrollment in EE 3330.

**4330 [4370]. Electronic Systems Design. 4.** Analog integrated circuits such as amplifiers (operational, instrumentation, isolation, video, transconductance, comparator, logarithmic and exponential); voltage regulators; analog multipliers and dividers; AC to DC converters; sample and hold circuits; digital to analog converters; analog to digital converters; function generators; phase locked loops. Includes design procedures for electronic systems implementing analog integrated circuits. Laboratory. *Prerequisites:* EE 2390 and 3330.

**4340. Semiconductor Materials and Devices. 3.** Physical properties of semiconductor materials and devices, including crystal lattices and energy bands, carrier generation, transport, and recombination. PN, metal-semiconductor, and heterojunction operation. Field Effect Transistors, including Metal Oxide Semiconductor (MOSFET), Junction (JFET), Metal Semiconductor (MESFET), and High Electron Mobility (HEMT) transistors. Bipo-



lar Junction (BJT) and Heterojunction (HBT) Transistor operation. Cross listed with PHYS 4340. *Prerequisite:* PHYS 1220 or 1320.

**4345. Hardware Digital Signal Processing. 3.** Hands-on introduction to real-time digital signal processing. Programming DSP algorithms using C on modern DSP hardware. Students gain deep understanding of fundamental DSP concepts by implementing selected applications including sampling, reconstruction, FIR and IIR filters, signal generation, and FFT. Hardware concepts include EDMA, memory maps, interrupts, buffered serial ports. *Prerequisite:* EE 3220.

**4360. VLSI Design. 3.** Introduction to CMOS processing, MOS fundamentals including devices models; switching and timing; analog subcircuits and amplifiers; inverters and CMOS gates; concept of standard cells and fully custom design; use of SPICE, digital simulation, and chip layout and verification software. *Prerequisites:* EE/COSC 2390 and EE 3330.

**4390. Microprocessors. 3.** Design of microcomputers, controllers and instruments which use microprocessors. Semiconductor memory design, CPU architecture, bus structure and timing, input-output interfaces and devices, assembly language programming, assemblers, compilers, editors and simulators. Emphasizes design techniques. Laboratory. *Prerequisite:* EE 2390.

**4440. Communication Theory. 3.** Amplitude and angle modulation and demodulation; digital baseband and carrier communication systems; performance of communication systems; and current topics in communication systems. *Prerequisite:* EE 3220.

**4490. Hardware Descriptive Language (HDL) Digital Design. 3.** Hardware Description Language design of digital systems. Industrial CAD tools are used to produce a functional description of hardware that is both simulated and then synthesized into hardware. Methods to describe both combinational logic and synchronous devices are given. Devices such as CPLDs and FPGAs are targeted in this design process. Emphasizes design techniques. *Prerequisite:* EE 2390.

**4510. Power Systems. 3.** Electric power distribution and transmission. Distribution systems, transmission line calculations, installation and protection; substations, corona, protective relaying and carrier current communication and telemetering. Introduction to system stability studies. *Prerequisites:* ES 2210 and EE 3510.

**4530. Digital Image Processing. 3.** Methodologies and algorithms for processing digital images by computer. Includes color spaces, pixel mappings, filtering, image segmenta-

tion, geometric operations and pattern classification. *Prerequisite:* EE 3220 or equivalent background.

**4540. Energy Policies and Impacts. 2.** Consequence of energy use; effects of development of coal, oil shale, oil, natural gas, uranium and geothermal energy; environmental impact on air and water pollution; federal, state and local regulations; renewable energy sources such as solar, wind, hydro, ocean thermal and wave. *Prerequisite:* senior standing.

**4550. Electrodynamics. 4.** Solid state control of AC and DC machines; DC machine dynamics; three-phase AC machine transients and dynamics; single phase motors; two-phase control motors; stepper motors; and synchros and control transformers. *Prerequisite:* EE 3510.

**4560. Power Electronics. 3.** Thyristors and other semiconductor devices; rectifiers; dual converters and cycloconverters; AC and DC switches and regulators; inverters and frequency changers; protection, control and application of static power converters. *Prerequisites:* EE 3330 and 3510.

**4590. Real Time Embedded Systems. 3.** Emphasizes a systems approach to real time embedded systems. Students are expected to apply methodical system design practices to designing and implementing a microprocessor-based real time embedded system. Students employ a robot-based educational platform to learn the intricacies of real time embedded systems, distributed processing, and fuzzy logic. Students learn processor input/output interfacing techniques. Students use state-of-the-art design and troubleshooting tools. Dual listed with EE 5590. *Prerequisite:* EE 4390.

**4620. Automatic Control Systems. 3.** Feedback control systems analysis and design using frequency domain, time response and state-space methods. Routh's criteria, Nyquist criteria and root locus. Dominant pole controller design. Introduction to discreet controllers. Use of MATLAB. *Prerequisite:* EE 2220.

**4800. Problems in \_\_\_\_\_. 1-6 (Max. 6).** Section 1 is individual study. Other sections are group study by seminar or class format. Features topics not included in regularly offered courses. *Prerequisite:* consent of instructor.

**4820. Senior Design I. 2.** Students choose a senior design project and complete the preliminary design. This stage of senior design includes investigation of alternative solutions that meet the project's requirements, cost analysis, and building the prototype circuit. Periodic oral and written project progress reports are required. *Prerequisites:* EE 2390, EE 3330 and corequisite courses in the area of the design project.

**4830. Senior Design II. 2.** Students complete the senior design project partially designed in EE 4820. The final result of the senior design project includes assembly of a PC board hardware that meets the project's requirements and final report describing the design procedure, designed hardware and software, and results of final testing. Periodic oral and written project progress reports are required. *Prerequisites:* EE 4820 and selected courses in the area of the design project.

**4850. Research in \_\_\_\_\_. 1-3 (Max. 4).** Research experience for individual students. Investigations or extensions of topics which are not a part of formal course. May not be substituted for thesis/dissertation research credit and/or undergraduate design requirement. *Prerequisite:* senior standing in EE.

**4870. Computer Network Hardware. 4.** Study of Computer Network hardware architecture, design and functionality. The course addresses IEEE wired and wireless network architectures, routers, gateways and other network components. System administration of Windows NT and 2000 based networks forms an important component of the course. Laboratory sessions include commercial hardware and performance analysis through simulations. *Prerequisite:* EE 2390.

**4970. Graphical Interface. 3.** Graphical interface development using a suitable graphics language and foundation classes. The course will address issues like dynamic library links, threads, multitasking, and hardware interface of an application running under an operating system (Windows NT). The majority of the applications will be in the electrical engineering and computer science areas. *Prerequisites:* EE/COSC 4070 or COSC 2030.

**4990. Advanced Microprocessors. 3.** Architecture and instruction set of Intel family of microprocessors; Intel System Development Kit and its monitor program; Microsoft Macro Assembler (MASM) and Visual C/C++ Express; modular programming; High level language compilers of object code; Interface design issues of peripheral devices to Personal Computer. *Prerequisite:* EE 4390.

**5210. Systems Theory. 3.** Review of linear time-invariant systems theory. Laplace, Fourier, and Z-transforms. Introduction to complex variable theory and its application to integral transform inversion. State variable formulation of physical systems. Application of linear algebra and matrices to the analysis of finite-state constant differential systems. Controllability and observability. *Prerequisite:* EE 4620.

**5300. Introduction to Microwave & RF Circuits. 3.** Analysis and design of microwave and RF circuits with applications to communication and radar systems. Review of transmission line concepts and the Smith Chart, scattering parameters, microstrip lines, and matching networks. Analysis and design of microwave and RF amplifiers, oscillators, and mixers. Dual listed with EE 4300. *Prerequisite:* EE 3150 or concurrent enrollment in EE 3330.

**5320. Advanced Microwave Circuits. 3.** Analysis and design of passive microwave circuits including microwave filters, resonators, power dividers, and directional couplers. Microstrip lines, broadband matching networks and effects of discontinuities in microstrip circuits are also discussed. *Prerequisites:* EE 4300 or EE 5300.

**5330. Advanced Electronic Systems Design. 3.** Theory of errors. High accuracy: multiplexers; voltage references; sample and hold circuits. Amplifiers: programmable gain; high speed voltage feedback; current feedback. Noise in integrated circuits. Pulse code modulation ADC; sigma delta ADC; oversampling; undersampling. Analog and digital audio systems. CD players. Superheterodyne and digital receivers. Signal transmission and conditioning. Hardware design techniques. *Prerequisite:* EE 4330 and 4210.

**5340. Advanced Semiconductor Material and Devices. 3.** Advanced semiconductor materials and device concepts including noise in semiconductors, heterostructure and quantum fundamentals, high power materials and devices, high performance transistors including the MESFET, HEMT, and HBT. Also discusses GUNN and IMPATT diodes, Resonant Tunneling devices, and future computing devices based on the quantum properties of semiconductors. *Prerequisite:* EE 4340.

**5350. Optoelectronic Semiconductor Materials and Devices. 3.** Optoelectronic properties of semiconductor materials and devices. Includes a review of the basic electronic properties of semiconductor materials, epitaxial growth, optical properties including absorption and emission of light, effects of quantum confinement and strain, and Heterostructures. Operation and optimization of basic optoelectronic devices including: photodetectors, LEDs Lasers, and modulators. *Prerequisite:* EE 4340.

**5360. Digital VLSI Design. 3.** Digital building blocks, stick diagrams, CMOS cells and arrays, CMOS digital subsystems and systems. Chip design software such as layout, simulators and digital synthesis using HDL. Digital design verification and timing issues. *Prerequisite:* EE 4360.

**5370. Analog VLSI Design. 3.** CMOS amplifiers, comparators, operational transconductance amplifiers, op-amps, D/A and A/D, signal sources, chip design, software and SPICE will be used. *Prerequisite:* EE 4360.

**5390. Computer Architecture. 3.** Examines the various methodologies used in the design of high-performance computer systems. Topics include CISC and RISC architecture and instruction sets, pipelining, instruction-level parallelism, memory hierarchy (including cache) design and computer networks. *Prerequisite:* EE 4390.

**5400. Introduction To Robotics. 3.** Representation of pose using Euler angles, quaternions and homogeneous coordinate transformations. Forward and inverse kinematics of rigid body manipulators. Velocity and force transformation in a rigid robot using Jacobians. Trajectory generation using splines. Robotic vision for depth measurement. Analysis of actual robotic systems. *Prerequisite:* MATH 2250.

**5410. Neural and Fuzzy Systems. 3.** Theory of feed forward and recurrent neural networks. Supervised and unsupervised learning theories. Fuzzy logic and systems. Associative memories. Matching and self-organizing networks. Application of neural and fuzzy systems. *Prerequisite:* EE 3220.

**5420. Speech Processing. 3.** Introduction to the field of digital speech processing and analysis. Speech production models. Analysis using LPC, spectrum, cepstrum, hidden Markov models. Pitch and formant estimation. Speech coding and compression. Speech and speaker recognition. Speech synthesis and enhancement. *Prerequisite:* EE 3220, EE 4220.

**5430. 3-D Computer Vision. 3.** This course is intended to provide a mathematical framework for describing three dimensional imaging and computer vision. Topics include 3-D coordinate transforms, image formation, camera calibration, reconstruction from two views, SIFT detection, hidden Markov models, Markov random fields, and "bag-of-words" visual description. *Prerequisites:* EE 4220, MATH 2250.

**5450. Topics in Robotics. 3.** Topics vary between offerings, but include exponential coordinates for describing rigid motion, parallel machines, robotic vision, actuators and sensors, calibration, quaternions, motion planning, multifinger grasp dynamics, singularities, and singularity-free design, and limited-DOF machines. *Prerequisite:* MATH 2250, senior or higher level standing and permission of the instructor.

**5460. Probabilistic Robotics. 3.** Fundamental theory underlying the robust sensing and planning used in self-driving machines is developed. Topics covered are: Bayesian, Kal-

man, and Particle Filters; simple ground robot motion models; mobile robot localization; simultaneous localization and mapping; partially observable Markov decision processes. *Prerequisite:* EE 4220.

**5470. Optimal Control. 3.** Calculus of Variations: Principal of Optimality; Hamilton-Jacobi-Bellman Equation; Linear Quadratic regulator; Linear Quadratic Gaussian; Loop Transfer Recovery; Suboptimal Feedback; LQR with Output Feedback; Optimal Estimation Theory; Pontryagin's minimum principle. *Prerequisites:* EE 4620, MATH 2210, MATH 2310, MATH 2250.

**5475. Adaptive Control Systems. 3.** Introduction to adaptive identification and control for counteracting uncertainty in a dynamical control system. Stability notions (input/output, Lyapunov, Barbalat's lemma, passivity), online parameter estimation, parameter convergence, persistency of excitation, direct & indirect adaptive control, Model Reference Adaptive Control, certainty equivalence, Adaptive Pole Placement Control, robustness against disturbances and unmodeled dynamics. Supervisory and Switching control. *Prerequisites:* EE 5210.

**5490. Convex Optimization. 3.** Covers fundamentals of numerical convex optimization. These methods have potential applications in many fields, so the goal of the course is to develop the skills and background needed to recognize, formulate, and solve convex optimization problems. Covers convex sets, convex functions, convex optimization problems and applications. *Prerequisites:* MATH 2250 and senior or higher level standing.

**5590. Real Time Embedded Systems. 3.** Emphasizes a systems approach to real time embedded systems. Students are expected to apply methodical system design practices to designing and implementing a microprocessor-based real time embedded system. Students employ a robot-based educational platform to learn the intricacies of real time embedded systems, distributed processing, and fuzzy logic. Students learn processor input/output interfacing techniques. Students use state-of-the-art design and troubleshooting tools. Dual listed with EE 4590. *Prerequisites:* EE 4390.

**5600. Statistical Signal Processing. 2-4. (Max. 9).** Topics vary between offerings but include signal detection, feature extraction and pattern recognition, information theory and coding, spectral analysis, identification, speech processing, image processing, and seismic processing. *Prerequisite:* EE 4220.

**5610. Random Processing Theory I. 3.** Introduction to statistical models. Applications of sampling theorems. Correlation functions and spectra. Shot noise and thermal noise.

Introduction to measurements and computational techniques. Nonlinear random processes. Term papers on special problems. *Prerequisite:* EE 4220.

**5625. Spectral Analysis. 3.** Spectral estimation including nonparametric methods such as Welch and Blackman-Tukey; modern parametric methods for AR, MA and ARMA spectra including Yule-Walker and Levinson-Durbin. Parametric line spectral subspace methods including MUSIC and ESPRIT. Filterbank and spatial methods such as beamforming. *Prerequisites:* EE 3220, 4220 or equivalent.

**5630. Advanced Image Processing. 3.** Introduces students to advanced aspects of image processing (IP), using specific applications to demonstrate these principles. Concepts such as medical imaging; color IP; wavelets and multiresolution IP; image compression; morphological IP; image segmentation, representation, description and understanding are covered. *Prerequisites:* EE 4530.

**5640. Adaptive Filters and Signal Processing. 3.** Adaptive filtering including eigenanalysis, low-rank modeling, Wiener filters, linear prediction, steepest descent methods, least mean-squares and recursive least squares methods, adaptive beamforming. Performance, convergence, and stability issues. Realization techniques. *Prerequisites:* EE 4220.

**5650. Object and Pattern Recognition. 3.** Introduces students to both fundamental and advanced aspects of object and pattern recognition, using specific applications to demonstrate these principles. Concepts such as Bayesian, maximum-likelihood, principal components, nonparametric, linear discriminant, multi-layer neural networks, etc., and the trade-offs and appropriateness of classification techniques are covered. *Prerequisite:* EE 4220.

**5660. System Identification. 3.** Fundamental and advanced topics in identification of system models from measured data. A variety of model structures are studied such as ARX, ARMAX, and State Space. Both non-parametric and parametric identification techniques are investigated with applications to real world systems and data. Experiment design and model validation are also examined. *Prerequisites:* EE 4220.

**5700. Power Engineering. 2-6 (Max. 6).** Design of transmission lines and distribution systems. Coordination studies. System stability studies, load distribution and dispatching. System interconnections. Correlation of machines and transmission systems. *Prerequisite:* EE 4510.

**5740. Digital Control Systems. 3.** Mathematical models of digital control system components; Sample-and-Hold Device, A/D and D/A conversion, Pulse transfer function,

Modified Z-transform; Jury's and Routh-Hurwitz test, Bilinear Transformations, Nyquist Criterion, Root Locus; Frequency Domain Techniques (Bode Diagrams, Nichols Charts); Digital Control Design, Observers; DT state space representation; Sampling and Quantization, Aliasing. Design Project. *Prerequisite:* EE 4620.

**5770. Non Linear Systems. 3.** Time variable parameter systems, approximation methods for small nonlinearities. Phase-plane methods. The second method of Liapunov. Describing function. Optimum switched systems. Adaptive control systems. *Prerequisite:* EE 4620.

**5880. Problems In Electrical Engineering. 1-6 (Max. 9).** A graduate special topics course in which advanced developments are studied. Section 1 is individual study. Other sections are primarily seminar format in which participants present reports on the subject under study. *Prerequisite:* Prior approval of the instructor is required.

**5885. Special Topics in Electrical Engineering. 1-6 (Max 30).** Features topics not included in regularly offered classes. Normally offered in regular class lecture format; may include a lab component if appropriate. *Prerequisite:* Prior approval of the instructor is required.

**5900. Practicum in College Teaching. 1-3. (Max 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 12).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrolled in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisites:* enrolled in a graduate level degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Bioengineering (BE)

**4800. Topics in Bioengineering. 2-6 (Max. 6).** Independent or group study of current topics not included in more formal course offerings in bioengineering, biology or engineering. *Prerequisite:* consent of instructor.

**4810. Bioinstrumentation. 3.** Electronic systems used to monitor physiological systems and function (cardiovascular, pulmonary, nervous); transducer systems, amplifiers and recording systems used in research and clinical applications. Laboratory. *Prerequisites:* EE 3330.

**4820. Biodata Systems. 3.** Extraction of physiological signals from noise, biomedical signal and image processing and modeling of physiological functions from experimental data. Includes hands-on exercises using both simulated and actual biomedical signals and/or images. Complements BE 4810, and can be taken alone, before, or after BE 4810. *Prerequisites:* EE 3320.

**5810. Bioinstrumentation. 3.** Discussion of the cardiovascular, pulmonary, and nervous systems with regard to monitoring function and the transducers used to measure system parameters. Transducer systems, amplifiers, and recording systems used in research and clinical applications. Dual listed with BE 4810. *Prerequisite:* basic course or equivalent in electronics, ZOO 4240 or concurrent enrollment.

**5820. Bio-Data Systems. 2.** Extraction of signals from noise and data analysis. Emphasis on system modeling of physiological functions from experimental data. Dual listed with BE 4820. *Prerequisite:* basic course, or equivalent, in electronics, ZOO 4240 or concurrent enrollment.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

## Environmental Engineering

3074 Engineering Building, 766-5255

E-mail: [ceinfo.uwyo.edu](mailto:ceinfo.uwyo.edu)

Web site: [www.eng.uwyo.edu/civil](http://www.eng.uwyo.edu/civil)

A master of science in environmental engineering is available in the College of Engineering through a joint effort of the Department of Civil and Architectural Engineering and the Department of Chemical and Petroleum Engineering in cooperation with the School of Environment and Natural Resources. This interdisciplinary degree offers students an engineering perspective for solutions to environmental problems. Emphasis is on minimization, monitoring, control, and

processing of waste products as well as treatment and disposal associated with point and non-point pollution sources. Integration of engineering with science, regulatory, and policy aspects of environmental engineering is an important component of this unique program. Further information is available from the environmental engineering graduate studies program office and/or departments involved.

### Program Specific Admission Requirements

Any additional requirements as per cooperating department: Civil and Architectural Engineering or Chemical and Petroleum Engineering.

### Program Specific Degree Requirements

*Master of Science in Environmental Engineering Plan A (thesis)*

Students must meet university minimum requirements.

Early in the program, the student must submit a program of study listing coursework for approval by the departmental graduate studies committee, the department head, and subsequently, the Office of the Registrar.

Plan A is required of all state supported graduate assistants.

*Plan B (non-thesis)*

Students must meet university minimum requirements

Early in the program, the student must submit a program of study listing coursework and the course number that the Plan B paper covers for approval by the graduate studies committee, the department head, and subsequently, the Office of the Registrar.

## Environmental Engineering (ENVE)

**5410. Advanced Biological Wastewater Treatment. 3.** Theory and practice of advanced biological treatment processes for municipal and industrial wastewaters, sludges, groundwater bioremediation and solid waste. Emphasis is on fundamental principles applied to the design and control of existing processes and the development of innovative systems. Cross listed with CE/CHE 5410. *Prerequisites:* consent of instructor.

**5425. Environmental Engineering Microbiology. 3.** Focuses on microbial processes of interest in environmental engineering applications, including microbial corrosion;

acid mine drainage; biogenic greenhouse gas emissions; biogeochemical cycling of nitrogen, phosphorus, and sulfur; microbial transformations involving iron and other metals/metalloids; anaerobic processes and syntrophic associations; methane oxidation; environmental transmission of pathogens; remediation of hazardous materials. Cross listed with CE 5425. *Prerequisite:* graduate standing.

**5430. Environmental Engineering Chemistry. 3.** Focus includes inorganic, organic, physical, equilibrium, biochemistry, colloidal and nuclear chemistry with an emphasis on the problems/solutions encountered by environmental and civil engineers. *Prerequisite:* CHEM 1020.

**5441. Solid Waste Engineering. 3.** Municipal solid waste characteristics and quantities, collection, landfills, processing of municipal solid waste, materials separation, combustion and energy recovery, and biochemical processes with an emphasis on materials flow. Integrated solid waste management principles are also discussed. Cross listed with CE 4441/CE 5441. *Prerequisite:* graduate standing.

**5445. Hazardous Waste Site Remediation. 3.** The contamination of soil, air, and groundwater by improper disposal of hazardous wastes is covered. Control and cleanup of contaminated groundwater plumes, treatment of polluted soils and soil gases is emphasized. Case studies are extensively used. Cross listed with CE 5445. *Prerequisite:* CE 3400.

**5450. Advanced Physical Chemical Treatment. 3.** A study of physical and chemical processes for treatment of water, and waste water. Cross listed with CE 5450. *Prerequisite:* CE 4400.

**5880. Topics. 1-3 (Max. 6).** Selected topics in environmental engineering. Offered on an individual or small group basis as appropriate. Intended to accommodate various specialized subjects not offered on a regular course. Students may enroll in more than one section of this course provided topics are different. *Prerequisite:* consent of instructor.

**5885. Problems. 1-3 (Max. 6).** Special course designed to make possible individual investigation of problems of environmental engineering selected to fit student's educational research needs. *Prerequisite:* consent of instructor.

**5895. Environmental Engineering Seminar. 1-3 (Max. 3).** Departmental seminar on current research with formal training for professional and scholarly presentation of research/technical papers. *Prerequisites:* consent of instructor, graduate standing.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

## Department of Mechanical Engineering

2052 Engineering Building, 766-2122

FAX: (307) 766-2695

Web site: [wwweng.uwyo.edu/mechanical](http://wwweng.uwyo.edu/mechanical)

E-mail: [me.info@uwyo.edu](mailto:me.info@uwyo.edu)

Department Head: Paul A. Dellenback

### Professors:

**DENNIS N. COON**, B.S. Alfred University-New York; M.S. 1984; Ph.D. Pennsylvania State University 1986; Professor of Mechanical Engineering 1999, 1988.

**DIMITRI J. MAVRIPLIS**, B.S. McGill University 1982; M.Eng. 1982; Ph.D. Princeton University 1987; Professor of Mechanical Engineering 2003.

**JONATHAN W. NAUGHTON**, B.S. Cornell University 1986; Ph.D. Pennsylvania State University 1993; Professor of Mechanical Engineering 2012, 1997.

### Associate Professors:

**PAUL A. DELLENBACK**, B.S. Texas Tech University 1978; M.S. 1980; Ph.D. Arizona State University 1986; Associate Professor of Mechanical Engineering 1994, 1990; Head of Mechanical Engineering 2009.

**CARL P. FRICK**, B.S. University of Colorado at Boulder 1999; M.S. 2003; Ph.D. 2005; Associate Professor of Mechanical Engineering 2014, 2008.

**MARK R. GARNICH**, B.S. Michigan Technological University 1981; M.S. 1983; Ph.D. University of Wyoming 1996; Associate Professor of Mechanical Engineering 2001.

**CHUNG-SOUK HAN**, Dipl.-Ing. Darmstadt University of Technology, 1994; Dr.-Ing. University of Hannover, 1999; Associate Professor of Mechanical Engineering 2010.

**JAYANARAYANAN SITARAMAN**, B.Tech., Indian Institute of Technology India 1998; M.S. University of Maryland 2000; Ph.D. 2003; Associate Professor of Mechanical Engineering 2014, 2009.

### Assistant Professors:

**DILPUNEET S. AIDHY**, B.E. Punjab Engineering College 2004; Ph.D. University of Florida 2009; Assistant Professor of Mechanical Engineering 2015.

**ERICA L. BELMONT**, B.S. Tufts University 2004; M.S. 2008; Ph.D. University of Texas at Austin 2014; Assistant Professor of Mechanical Engineering 2014.

**JIAN CAI**, University of Science and Technology of China 2005; Ph.D. Clemson University 2010; Assistant Professor of Mechanical Engineering 2015.

**RAY S. FERTIG III**, B.S. University of Wyoming 2001; M.S. 2003; Ph.D. Cornell University 2010; Assistant Professor of Mechanical Engineering 2011.

**MICHAEL STOELLINGER**, M.S. Technical University Munich 2005; Ph.D. University of Wyoming 2010; Assistant Professor of Mechanical Engineering 2012.

**YUAN ZHENG**, B.S. Shanghai Jiaotong University, China 1992; M.S. Purdue University 1999; Ph.D. 2003, Assistant Professor of Mechanical Engineering 2009.

#### Associate Lecturer:

**KEVIN KELTY**, B.S. Montana State University 1975; M.S. University of Utah 1978; Ph.D. 1982; Associate Lecturer in Mechanical Engineering 2014.

**ANN NANCY PECK**, B.S. Lehigh University 1984; M.S. Rensselaer Polytechnic Institute 1987; Ph.D. 1992; Associate Lecturer in Mechanical Engineering 2000, 1997.

#### Professors Emeriti:

Donald F. Adams  
Bruce R. Dewey  
Andrew Hansen  
William R. Lindberg  
John E. Nydahl  
Kynric M. Pell  
Ovid A. Plumb  
Donald A. Smith  
David E. Walrath  
Robert A. Wheasler

#### Adjunct Faculty:

Stephan Heinz  
Dan Stanescu

**M**echanical Engineering is the broadest area of study in engineering. In contrast to other engineering disciplines, mechanical engineers are employed in significant percentages in almost all industrial and governmental organizations that employ engineers.

The spectrum of activities in which mechanical engineers are engaged continues to expand. The curriculum has in turn become flexible to allow for the education of mechanical engineering students in many diverse and allied areas, or for graduate school preparation.

The educational objectives of the Department of Mechanical Engineering are as follows:

- Demonstrate career success through professional accomplishments
- Demonstrate continued development of problem solving skills through independent learning
- Demonstrate effective communication and design skills with recognition of appropriate constraints
- Demonstrate ethical considerations, safety, and sustainability in engineering practice

The undergraduate program includes a foundation in mathematics, science, and engineering sciences. The three key elements of the mechanical engineering undergraduate program are laboratory experience, design experience, and development of communication skills.

The mechanical engineering curriculum affords the student the flexibility to pursue specific professional goals within the discipline. Such an opportunity needs to be carefully considered by each student, so that elective courses are chosen with these goals in mind. During the junior and senior years, the student selects 15 credit hours of technical electives.

Mechanical and Energy Systems engineering degree candidates must meet the academic requirements of the college and in addition must have an average GPA of 2.0 (C) in Mechanical and/or Energy Systems engineering courses completed at this university. A grade of C- or better must be earned in all engineering science and required mathematics courses.

### Mechanical Engineering Success Curriculum

All undergraduate students in the B.S. Mechanical Engineering and B.S. Energy Systems Engineering programs must successfully complete the Mechanical Engineering Success Curriculum prior to enrolling in any upper-division (3000-5000 level) courses taught by the Mechanical Engineering Department. The Mechanical Engineering Success Curriculum promotes successful completion of upper-division coursework by assuring a student that their foundational knowledge and skills are strong in mathematics and engineering fundamentals. To successfully complete the Mechanical Engineering Success Curriculum, a student must earn a minimum 3.0 GPA in the following 10 courses: MATH 2200, MATH 2205, MATH 2210, ES 1060, ES 2110, ES 2120, ES 2210, ES 2310, ES 2330, and ES

2410. AP courses are excluded from the GPA calculation, but grades transferred from other institutions will be used in evaluating the ME Success Curriculum GPA.

### Mechanical Engineering Curriculum\*

#### Suggested Course Sequence

<b>FRESHMAN YEAR: Fall</b>		<b>Hrs.</b>
MATH	2200 .....	4
First-Year Seminar (FYS)	.....	3
U.S. and WY Constitutions (V)	.....	3
CHEM	1020 .....	4
ENGL	1010 (COM1) .....	3
<b>Total Hrs.</b>		<b>17</b>

<b>FRESHMAN YEAR: Spring</b>		<b>Hrs.</b>
MATH	2205 .....	4
ES	2110 .....	3
COJO	2010 (COM2) .....	3
Human Culture <sup>1</sup> (H)	.....	3
Math/Science elective <sup>2</sup>	.....	3
<b>Total Hrs.</b>		<b>16</b>

<b>SOPHOMORE YEAR: Fall</b>		<b>Hrs.</b>
ES	1060 .....	3
ES	2120 .....	3
ES	2210 .....	3
MATH	2210 .....	4
PHYS	1220 .....	4
<b>Total Hrs.</b>		<b>17</b>

<b>SOPHOMORE YEAR: Spring</b>		<b>Hrs.</b>
MATH	2310 .....	3
ES	2310 .....	3
ES	2330 .....	3
ES	2410 .....	3
ME	2005 .....	3
CHEM 1030 or PHYS 2310 or 2320	.....	3-4
<b>Total Hrs.</b>		<b>18-19</b>

<b>JUNIOR YEAR: Fall</b>		<b>Hrs.</b>
ME	3005 .....	3
ME	3010 .....	3
ME	3020 .....	3
ME	3040 .....	3
ME	3060 .....	3
Human Culture <sup>1</sup> (H)	.....	3
<b>Total Hrs.</b>		<b>18</b>

<b>JUNIOR YEAR: Spring</b>		<b>Hrs.</b>
ME	3160 .....	3
ME	3170 .....	3
ME	3360 .....	3
ME	3450 .....	3
ME	4020 .....	3
<b>Total Hrs.</b>		<b>15</b>

<b>SENIOR YEAR: Fall</b>		<b>Hrs.</b>
ME	4060 .....	3
ME Elective <sup>3</sup>	.....	3
ME Elective <sup>3</sup>	.....	3
Math/Science Elective <sup>2</sup>	.....	3

Business Elective <sup>4</sup> .....	3
<b>Total Hrs.</b>	<b>15</b>
<b>SENIOR YEAR: Spring</b>	
<b>Hrs.</b>	
ME 4070 (COM3) .....	3
ME Elective <sup>3</sup> .....	3
ME Elective <sup>3</sup> .....	3
ME 4150 .....	3
Technical Elective <sup>5</sup> .....	3
<b>Total Hrs.</b>	<b>15</b>
<b>Total Hours to BSME Degree:</b>	<b>131</b>

<sup>1</sup>Approved H course in USP 2015

<sup>2</sup>Math/Science Electives must be chosen from a Department approved list.

<sup>3</sup>ME Elective: Any ME Course or EE 4620

<sup>4</sup>Business Elective: May be chosen from a Department approved list.

<sup>5</sup>Technical Elective: May be chosen from any engr. approved math/science, or approved business.

42 hours of 3000+ level coursework fulfilled by required ME courses and ME Electives.

Degree candidates must meet academic requirements of the college and have a minimum grade point average of 2.00 in all ME courses completed at UW.

## Graduate Study

The Department of Mechanical Engineering offers graduate study leading to the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees in Mechanical Engineering. Mechanical engineering faculty conduct research in the areas of aerodynamics, computational fluid dynamics, wind energy, heat transfer, gasification, biomaterials, composite materials, continuum mechanics, computational material science, materials reliability, mechanical behavior of materials, and nanomechanics of surfaces and interfaces.

## Department Specific Admission Requirements

Applicants should possess a Bachelor of Science (B.S.) degree or equivalent in Mechanical Engineering. Students that do not hold B.S./M.E. degrees may qualify as M.S. candidates by completing, without credit, certain prerequisite courses as specified by the Department. These prerequisites would depend upon the candidate's background and upon the area in which he/she plans to specialize.

In addition to the required application materials (i.e. application form, academic transcript, GRE/TOFEL scores, letters of reference) the applicant must submit a Statement of Purpose indicating their technical area of interest, abilities, and objectives in completing a graduate degree in mechanical engineering.

A minimum composite score of 294 (MS) or 307 (PhD) on the Verbal and Quantitative sections of the GRE is typically required for full admission to the Mechanical Engineering Department. For international students, a minimum score of 577 on the written exam or 90 on the Internet-based test (iBT) is typically required for full admission.

## Program Specific Degree Requirements

### *Master of Science (M.S.) Program*

The Mechanical Engineering Department offers both a thesis (Plan A) and a non-thesis (Plan B) M.S. program. For either program, courses should be chosen so that one is a 5000-level course outside the student's area of primary interest, and two courses should be mathematics-oriented. In conjunction with their adviser, students select the remaining courses in their program. No graduate credit is allowed for 4000-level mechanical engineering courses.

### *Plan A (thesis)*

A thesis project is chosen in consultation with an ME faculty member, and constitutes 4 credit hours of the 30-hour Plan A program. A maximum of 9 credits at the 4000-level may be taken. ME 5478 (Seminar) is to be taken during the final semester when the thesis is presented and defended, and constitutes 2 credit hours of the 30-hour Plan A program.

### *Plan B (non-thesis)*

The Plan B M.S. degree can be completed by earning a minimum of 31 credits beyond the baccalaureate degree.

Classes must meet the following constraints:

Mathematics or Statistics (4000-level or above); minimum of 6 hours

ME courses (5000-level); minimum of 15 hours

Graduate Project (ME 5961); minimum of 1 hour

Technical Electives (4000-level or higher); minimum of 9 hours

Total: minimum of 31 hours

Technical electives must be chosen with the approval of the academic adviser. They can be in mathematics, statistics, science, or other engineering disciplines. Up to two courses may be from the fields of business, ENR, or public policy.

- A maximum of 12 credits at the 4000 level may be taken. Special topic credits may be earned using ME 5475; a maximum of 6 credits may be earned in

this manner.

- Research credits earned through ME 5960 as part of an unfinished M.S. Plan A program may not be counted. Although the Plan B M.S. degree is not research-oriented, the program must contain an "element of discovery," documented by completing ME 5961 (Graduate Project). This could be a special project performed as independent study or as part of a graduate course.
- On-campus students enrolled in the Plan B program will be expected to attend at least three Mechanical Engineering Department graduate seminars per semester.

### *Quick Start BS/MS Program*

Through judicious choice of undergraduate electives, this program allows double-counting up to two 5000-level courses from the B.S. program toward M.S. degree requirements, thus reducing the time requirement for completing an M.S. degree. Students can apply for admission to the B.S./M.S. program by achieving junior status and meeting the following requirements for admission:

- completion of the four core ME courses (ME 3010, ME 3020, ME 3040, and ME 3360),
- a minimum overall GPA of 3.25,
- a minimum GPA of 3.25 in ME courses, and
- a minimum of three letters of recommendation (at least two must be from ME faculty at UW).

Students must maintain a GPA of at least 3.25 in their undergraduate and at least 3.0 in their graduate coursework in order to remain in good standing in the program. Not meeting the GPA requirement places a student on probation for one semester. If the GPA requirement is not met after that semester, the student will be dismissed from the Quick Start program.

Transfer students must have taken courses equivalent to the ME core courses. Transfer students must have also completed at least 15 credit hours of courses at UW in order to be eligible for admission.

## Doctoral Program

For students of outstanding academic ability and with demonstrated capacity for undertaking independent research on advanced engineering problems, the Ph.D. program in mechanical engineering is offered. The PhD requires a minimum of 72 graduate hours, at

least 42 of which must be earned in formal coursework. No graduate credit is allowed for 4000-level mechanical engineering courses. The preliminary exam should be completed within 2 semesters after the student has completed 30 hours of coursework as indicated on their Program of Study. The preliminary exam shall consist of a written component and an open presentation of the proposed dissertation research. The dissertation research will be publicly presented and conclusions defended in accordance with university policy.

## Mechanical Engineering (ME)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀Q]).

### 2005. Writing for Mechanical Engineers. 3.

Develops writing styles and techniques, document design and formats, and audience/readership considerations that are specifically suited to the mechanical engineering profession. The course concludes with a student-directed long-form report, and includes a significant oral presentation component. *Prerequisites:* Successful completion of WA requirement and sophomore standing in Mechanical Engineering.

### 3005 [2010; 2020]. Engineering Experimentation. 3.

A combined lecture/laboratory course introducing students to experimental methods in the context of dynamics. Written technical communication, intermediate structured programming, experimental design, fundamental statistics, and uncertainty methods (numerical and analytical) are emphasized. Collaborative writing and teamwork is introduced. Cross listed with ESE 3005. *Prerequisites:* ES 1060; ES 2120; companion course ME 2005.

### 3010. Intermediate Mechanics of Materials. 3.

Expansion of the principles of solid mechanics: stress, strain, principal stresses, elastic and plastic behavior, failure theories and the use of energy methods. Analysis and design of thick-walled pressure vessels, noncircular cross sections under torsion, nonsymmetric beams under bending and curved beams. *Prerequisite:* ES 2410.

**3020. System Dynamics. 3.** Theoretical and experimental study of the dynamics of linear and non-linear lumped parameter models of mechanical, electrical, electronic, fluid, thermal and mixed systems. Cross listed with ESE 3020. *Prerequisites:* ES 2210, ME/ESE 2020, and MATH 2310. (Normally offered fall semester)

**3040. Thermodynamics II. 3.** Consideration of advanced thermodynamic topics including Maxwell's relations, compressible flow, and combustion. Applications to design of refrigeration cycles, humidification systems, and Rankine cycles. Cross listed with ESE 3040. *Prerequisite:* CHEM 1020 and ES 2310. (Normally offered fall semester)

### 3060. Numerical Methods for Engineers. 3.

Numerical solutions of problems commonly encountered in mechanical engineering including differentiation, integration, differential equations, system of linear and nonlinear equations, and optimization. The structured programming approach will be emphasized and applications from solid mechanics, thermal fluid sciences, materials science, and dynamic systems will be covered. Cross listed with ESE 3060. *Prerequisites:* ES 1060; corequisite of MATH 2310.

### 3160 [2140; 2160]. Thermal/Fluid Science Lab. 3.

A laboratory course to introduce students to experimental methods for temperature measure and pressure/flow characteristics of fluids. Continuation of experience with communication (written, oral, and digital), intermediate programming, experimental design, data analysis, and teamwork skills is emphasized. Cross listed with ESE 3160. *Prerequisites:* ES 2330; ME/ESE 3005.

### 3170. Machine Design. 3.

Application of engineering mechanics and materials science to the analysis and design of mechanical components such as bolted connections, springs, gears, bearings and shafts. Design for dynamic loading conditions. Principles of hydrodynamic lubrication. Introduction to computer-aided design. Case studies with appropriate topics. *Prerequisite:* ES 2410. (Normally offered spring semester)

### 3360 [ES 3360, ES 4360]. Fundamentals of Transport Phenomena. 3.

Basic concepts of heat and mass transfer and their applications to problems involving engineering analysis and design. Topics include steady-state and transient conduction, free and forced convection (heat and mass), radiation and heat exchangers. Cross listed with ARE/ESE 3360. *Prerequisites:* ES 2310, ES 2330 and MATH 2310.

### 3400. Heating, Ventilating and Air Conditioning of Buildings. 3.

Qualitative and quantitative study in concepts of basic air-conditioning with focus on buildings including building envelope, moist air thermodynamics, human comfort, thermal load calculations, thermal behavior of buildings, HVAC systems/equipment, and design of space air-conditioning and its relationship to architectural design.

Cross listed with ARE 3400. *Prerequisites:* ES 2310, ES 2330, and either ARE 2410 or ME/ESE 3360.

### 3450 [ES 3450]. Properties of Materials. 3.

Mechanical, electrical, thermal and chemical properties of materials. Theoretical treatment of structure of solids and designs for specified properties. Laboratory. *Prerequisite:* CHEM 1020 and ES 2310. (Normally offered spring semester)

### 4010. Mechanical Vibrations. 3.

The theory of single and multi-degree-of-freedom systems with an introduction to continuous systems. Determination of equations of motion, including natural frequency for free vibration and amplitude of forced vibration. Design of discrete and continuous systems for transient and harmonic excitations. *Prerequisites:* ES 2120, ES 2410, and MATH 2310. (Normally offered fall semester)

### 4020. Design of Mechanical/Electronic Systems. 3.

Theoretical and experimental study of sensors and actuators, interfacing sensors and actuators to a microcomputer, discrete and continuous controller design, analog and digital electronics, and real-time programming for control. *Prerequisites:* ME 3020. (Normally offered spring semester)

### 4040. Introduction to Finite Elements. 3.

An introduction to the theory and application of finite elements to the solution of various problems with emphasis on structural mechanics. The course includes development of the underlying matrix equations, the treatment of element generation and properties, and implementation of boundary conditions. Dual listed with ME 5040. *Prerequisites:* MATH 2310 and (CE/ARE 4200 or MATH 2250 or ME 3610).

### 4060 [3070]. Systems Design I. 3.

[(none)◀COM3] First of a two-course design sequence constituting a capstone design experience. Student multidisciplinary teams prepare a project proposal or SOQ, generate a morphological study of their project and prepare project plans and specifications. Project management methods are also presented. *Prerequisites:* ME 3010, ME 3170, and ME/ESE/ARE 3360. (Normally offered fall semester)

### 4070. Systems Design II. 3. [WC◀(none)]

Continuation of a two-course design sequence. The design teams refine their designs, fabricate the project, test the project for compliance with the design specifications, write a comprehensive engineering design report including socioeconomic factors, and prepare and deliver a presentation of the project in a public forum. *Prerequisites:* ME 4060 and WB. (Normally offered spring semester)

**4100. Manufacturing Processes. 3.** Details of manufacturing processes used in production of metal, plastic and ceramic components with an emphasis on science and mechanics of processes. *Prerequisites:* ME 3010 and ME 3450.

**4150. Mechanical Behavior of Materials. 3.** Commonly encountered phenomenological and mechanistic behaviors that lead to mechanical failure are examined. Understanding the origin of mechanical failure of components allows for robust design of mechanical systems. Metallic, polymeric, and ceramic materials are covered. *Prerequisite:* ME 3450.

**4210. Introduction to Composite Materials. 3.** Applications, mechanical properties and fabrication of fiber reinforced composite materials; stress analysis of laminated, anisotropic composite structures; study of special problems unique to composites. *Prerequisite:* ME 3010. (Normally offered fall semester)

**4215. Composite Materials Design and Manufacturing. 3.** Introduction to composite material manufacturing processes. Aspects of constituent material production, as well as design, fabrication, and testing of composite materials. Laboratory exercises, such as laminating, filament winding, pultrusion and compression molding. *Prerequisite:* ME 4210. (Normally offered spring semester)

**4240. Gas Dynamics I. 3.** Thermodynamics of a compressible fluid; one-dimensional isentropic flow, normal and oblique shocks, expansion wave, flows with friction and heat transfer. *Prerequisites:* ES 2310 and ES 2330.

**4330. Internal Combustion Engines. 3.** Thermodynamic analysis and design of Otto and Diesel cycles for vehicle applications and stationary power generation. A substantial laboratory component will examine design and manufacturing issues, as well as engine performance in a variety of scenarios. Cross listed with ESE 4330. *Prerequisites:* ME/ESE 3040 and ME/ARE/ESE 3360.

**4340. Gas Turbine Engines. 3.** Thermodynamic analysis and design of ground-based and aero-propulsion gas turbine engines. *Prerequisites:* ES 2310 and ES 2330. (Normally offered spring semester)

**4350. Airplane Aerodynamics and Flight. 3.** Introduces students to the fundamentals of airfoil and wing design, airplane aerodynamics, and airplane stability. Links these fundamental ideas to the design and performance of real aircraft. *Prerequisites:* ES 2330. (Normally offered spring semester)

**4360. Introduction to Nuclear Energy. 3.** Introduction to the fundamentals of nuclear engineering, including power plant design and the fuel cycle. Topics include the fuel cycle and fuel design, reactor physics, reactor theory and

design, reactor thermo-hydraulics, radiation protection and safety, and fuel reprocessing and recycling. Cross listed with ESE 4360. *Prerequisites:* MATH 2310, ME/ESE 3040, and ME/ARE/ESE 3360.

**4380. Steam Plant Engineering I. 3.** Consideration of detailed component design for major subsystems in steam plants, including various boiler types, steam turbines, coal pulverizers, coal gasifiers, heat exchangers, air heaters, sulfur scrubbers, and ash removal systems. Applications to solar, geothermal, biomass, nuclear, natural gas, and coal-fired plants will be presented. Integration of steam plants in combined cycles and coal gasification cycles will be discussed. Cross listed with ESE 4380. *Prerequisites:* ME/ESE 3040 and ME/ESE/ARE 3360.

**4430. HVAC Systems Analysis and Design. 3.** Engineering design and performance analysis procedures for commercial building mechanical systems including energy conservation techniques. Relationship to aesthetic, architectural and structural elements are considered. Cross listed with ARE 4430. *Prerequisites:* ME/ARE 3400. (Normally offered alternate spring semesters)

**4450 [3110]. Principles of Materials Selection. 3.** A review of the economic and engineering aspects of materials selection. A detailed study of the properties, applications and limitations of engineering materials systems. Emphasis is on metal alloy systems, but non-metallics are included. Forming and joining processes are outlined. *Prerequisite:* ME 3450. (Normally offered spring semester)

**4460. Solar and Geothermal Engineering. 3.** An introduction to the engineering of solar-powered energy systems, including evaluation of the energy resource, passive design considerations, economics of active solar systems, design of flat plate collectors and water heating systems, and design of concentrating collectors for larger building or electrical generation applications. Design considerations for geothermal energy systems for both small-scale and commercial-scale applications. Cross listed with ESE 4460. *Prerequisite:* ESE/ME/ARE 3360.

**4470. Wind and Ocean Energy Engineering. 3.** Introduction to the harvesting of wind and ocean energy, including discussions of the wind resource, wind turbine aerodynamics, blade materials, turbine dynamics, electrical systems, control systems, and energy storage. An overview of ocean energy capture systems is also presented. Cross listed with ESE 4470. *Prerequisites:* ES 2210, ES 2310, ES 2330, and ES 2410.

**4474. Topics in Mechanical Engineering I. 1-3 (Max. 6).** Directed research in mechanical engineering. *Prerequisite:* junior standing in engineering. (Offered both semesters)

**4480. Building Air and Hydronic Systems. 3.** Design and analysis of building air and hydronic systems with focus on the application, design and analysis of thermal energy distribution systems (air and hydronic systems) for building space air conditioning. Requires enrollment in associated laboratory session. Cross listed with ARE 4480. *Prerequisite:* ME/ARE 4430.

**4490. Modeling and Optimization of Energy Systems. 3.** Application of principles of thermodynamics, fluids, and heat and mass transfer in the component and system-level design of energy/thermal systems, including modeling, simulation and optimization techniques. Examples are drawn from building environmental control, energy conversion and thermal industrial processes. Students work on projects for integration of these components in the design of energy/thermal systems. Requires enrollment in associated laboratory session. Cross listed with ARE 4490. *Prerequisites:* ME/ESE/ARE 3360 and ME/ARE 3400.

**5040. Introduction to Finite Element Analysis. 3.** An introduction to the theory and application of finite elements to the solution of various problems with emphasis on structural mechanics. Includes development of the underlying matrix equations, the treatment of element generation and properties, and implementation of boundary conditions. Dual listed with ME 4040. *Prerequisites:* MATH 2310 and (CE 4200 or ARE 4200 or ME 3010).

**5045. Advanced Finite Element Analysis. 3.** Advanced topics in finite element analysis with emphasis on mathematical foundations of the method, numerical algorithms for software implementation, and analysis of problems with material and geometric nonlinear behavior. Cross listed with CE 5045. *Prerequisite:* ME 4040 or ME 5040 or CE 5040.

**5140. Computational Methods I. 3.** First semester of a three-semester computational methods series. Second and third courses of this series offered in MATH Department. Review of iterative solutions of linear and nonlinear systems of equations, polynomial interpolation/approximation, numerical integration and differentiation, and basic ideas of Monte Carlo methods. Comparison of numerical techniques for programming time and space requirements, as well as convergence and stability. Identical to: PETE 5140, CE 5140, CHE 5140 and COSC 5310 and MATH 5310. *Prerequisite:* MATH 3310, COSC 1010.



**5422. Advanced Vibrations. 3.** Advanced principles of dynamics: Hamilton's principle, Lagrange's equations, modal analysis of discrete systems. Analysis of continuous systems; natural modes, approximate methods, forced vibration. Introduction to random vibration. *Prerequisite:* ME 4010.

**5431. Analysis of Composite Materials. 3.** An introduction to the methods of analysis applied to heterogeneous material systems. Emphasis of this course is on stress based formulations and failure analysis of fiber reinforced materials including laminates. *Prerequisite:* graduate standing.

**5432. Advanced Materials Science. 3.** An analysis of the relationships between the structures of materials and their mechanical and physical properties, leading to the application of these relationships to the design of materials for advanced engineering systems. Topics include crystallography, lattice defects, transport phenomena, phase transformations, fracture, environmental effects, and control of microstructure by processing. *Prerequisites:* ME 3450.

**5434. Computational Materials Science. 3.** Fundamentals of quantum and statistical physics with application to modeling and simulation of engineering materials at the atomic scale. Course includes simulation of structural and mechanical properties of nanostructured materials. *Prerequisite:* ME 5000 or equivalent.

**5435. Failure of Engineering Materials. 3.** Introduction to failure of common engineering materials. Considers both experimental and analytical techniques for failure analysis and prevention. Topics include overload, fracture mechanics, fatigue, environmentally assisted fatigue, and creep. *Prerequisite:* ME 3450 or equivalent.

**5438. Plasticity and Viscoelasticity. 3.** Analysis of stress and deformation of idealized plastic and viscoelastic solids. Limit theorems in plasticity. Time-dependent behavior of viscoelastic materials. *Prerequisite:* ME 5000.

**5440. Fluid Mechanics. 3.** Lagrangian and Eulerian descriptions, conservation laws, stress and rate-of-stress tensors, Navier-Stokes equations, energy equations, vorticity and circulation inviscid and potential flows, laminar flows, turbulent flows, boundary-layer theory. Cross listed with CHE 5440.

**5442. Advanced Fluid Mechanics. 3.** Introduction to inviscid and viscous hydrodynamic stability; closure in turbulent flows; vorticity and vortex dynamics, theoretical aerodynamics, numerical simulations of viscous flows, experimental methods in fluid flows. *Prerequisite:* ME 5440.

**5444. Optical Diagnostics in the Thermal and Fluid Sciences. 3.** An introduction to optical measurement schemes used in gas and liquid flows. Topics include a review of relevant optical principles and lasers, and in-depth coverage of laser velocimetry, droplet and particle sizing, and temperature measurement. *Prerequisite:* graduate standing.

**5446. Turbulence. 3.** Basic notions, properties and scales in turbulent flows. Transport equations; Reynold's stresses, mixing and phenomenological theories. Turbulence dynamics; mean and fluctuating kinetic energy balances, vorticity and temperature fluctuations. Statistical description of turbulence; correlations and spectra, transport, isotropy and homogeneity. Shear flows; plane jets, wakes and boundary layers (including planetary). Turbulent diffusion. Cross listed with CHE 5446. *Prerequisite:* ME 5440.

**5448. Experimental Fluid Dynamics. 3.** Provides an introduction to the design of fluid dynamics experiments. Specific instrumentation will be discussed and methods of analyzing and assessing data will be presented. *Prerequisites:* graduate standing.

**5450. Conduction and Radiation. 3.** Applications of principles of heat transfer and thermodynamics to solution of steady-state and transient problems. Classical heat conduction theory. Radiation heat transfer theory. *Prerequisite:* MATH 4440 or concurrent registration.

**5452. Convection Heat Transfer. 3.** Convection, including heat and momentum transfer. Boundary layer theory. Laminar and turbulent flows, steady and unsteady formulations including differential and integral descriptions. High velocity, compressible systems. Cross listed with CHE 5452. *Prerequisite:* ES 3360 or consent of instructor.

**5455. Introduction to Combustion Engineering. 3.** An introduction to the basic physics and chemistry of combustion engineering and its applications, including chemical thermodynamics, chemical kinetics and fuel oxidation mechanism, multicomponent conservation equations, laminar nonpremixed flames, droplet combustion, carbon particle combustion, and applications to modern IC engines, biomass and clean coal systems. *Prerequisites:* graduate standing.

**5461. Computational Fluid Dynamics I. 3.** An introduction to the fundamental techniques and theory of computational fluid dynamics. Topics include discretization methods (finite difference, finite volume, and finite element methods), numerical stability, consistency and convergence, and solution techniques such

as explicit, implicit and multigrid methods. The emphasis will be on modern techniques for compressible flows. *Prerequisite:* MATH 5310.

**5462. Computational Fluid Dynamics II. 3.** A study of advanced techniques in modern-day scientific computing as applied to Computational Fluid Dynamics. These include unstructured mesh generation using Delaunay triangulation, searching and sorting techniques, and efficient data structures. Other topics cover efficient hardware implementation including cache-effects and parallel computing and sensitivity analysis for design optimization. *Prerequisite:* ME 5461.

**5472. Continuum Mechanics. 3.** The basic laws of the physical behavior of continuous media. Stress and deformation at a point; fundamental equations of balance of mass, momentum, and energy; second law of thermodynamics; curvilinear coordinate analysis. Applications to linear elasticity and fluid mechanics. *Prerequisite:* MATH 3310.

**5474. Energy Methods. 3.** Introduction to variational calculus with applications in solid mechanics. The basic theorems of virtual work, minimum potential energy, and complementary energy are developed. Direct methods such as Castigliano's theorem as well as the approximate methods of Ritz and Galerkin are developed and used to obtain solutions for a variety of problems in solid mechanics. *Prerequisite:* ME 3010.

**5475. Topics in Mechanical Engineering II. 1-6 (Max 6).** Directed research in mechanical engineering. *Prerequisite:* senior or graduate standing in engineering.

**5476. Topics in Mechanical Engineering III. 1-6 (Max. 6).** Directed research in mechanical engineering. *Prerequisite:* graduate standing in engineering.

**5478. Seminar in Mechanical Engineer. 2.** *Prerequisite:* graduate standing in engineering.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Students are expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5961. Graduate Projects. 1-4 (Max. 4).** Limited to those students enrolled in a Plan B graduate program. Students should be involved in non-course scholarly activities in support of their Plan B project. *Prerequisites:* enrollment in Plan B program and have departmental approval.

**5980. Dissertation Research. 1-12 (Max. 48).** Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

### Energy Systems Engineering

Energy Systems Engineering is an ABET-accredited undergraduate degree offering by the Department of Mechanical Engineering. The ESE program was designed to train engineers to address one of this country's foremost challenges: to achieve energy independence and yet meet the growing demand for energy, while at the same time addressing critical environmental concerns. The program is intended to help meet these challenges by preparing students to be:

- technology leaders in energy conversion and environmental protection systems
- capable managers in the energy industry
- versatile overseers of energy development by the governmental sector
- technically-trained and environmentally-sensitive liaisons between the energy industry and the public.

ESE students will be trained in alternative and environmentally-friendly energy conversion systems, as well as more traditional technologies that will continue to play an important role for the foreseeable future.

Although the discipline of mechanical engineering has historically been responsible for the design of energy conversion cycles and equipment, issues outside the conventional realms of engineering are increasingly important to address as new and improved energy conversion systems are implemented. The engineer trained in Energy Systems will be better equipped than traditional mechanical

engineers to deal with the environmental, legal, political, economic, and permitting aspects of new energy projects.

It should be emphasized that ESE is a rigorous engineering program that requires dedicated preparation in high school, including four years of math, science, and language arts. The ESE degree has many course work requirements in common with the Mechanical Engineering degree, particularly in the thermal, fluids, and energy conversion sciences. However, the ESE program emphasizes energy conversion aspects of Mechanical Engineering and requires course work from UW's School of Environment and Natural Resources (SENR), course work in environmental ethics and environmental law, and two electives picked from a list of classes that focus attention on energy and the environment. The SENR courses will expose students to issues related to permitting such as preparation of environmental impact studies, and regulations such as the Endangered Species Act. In addition, there are five technical electives that allow the student to choose more detailed study in personal areas of interest, including for example, courses in environmental engineering, wind engineering, solar engineering, nuclear engineering, and petroleum engineering.

The educational objectives of the ESE program are the same as those listed for the ME program. Energy Systems Engineering degree candidates must meet the academic requirements of the College and must have a minimum GPA of 2.00 (C) in ESE and ME course work. An International Engineering Option similar to that in ME is also available. A grade of C- or better in engineering science, mathematics, and basic sciences courses is required to fulfill prerequisites in Mechanical and Energy Systems engineering courses.

### Energy Systems Engineering Option Curriculum\*

#### Suggested Course Sequence

<b>FRESHMAN YEAR: Fall</b>		<b>Hrs.</b>
MATH	2200 .....	4
First-Year Seminar (FYS).....		3
U.S. and WY Constitutions (V).....		3
CHEM	1020 .....	4
ENGL	1010 (COM1) .....	3
<b>Total Hrs.</b>		<b>17</b>

<b>FRESHMAN YEAR: Spring</b>		<b>Hrs.</b>
MATH	2205 .....	4
ES	2110 .....	3
COJO	2010 (COM2).....	3
Human Culture <sup>1</sup> (H).....		3
LIFE	1010 .....	4
<b>Total Hrs.</b>		<b>17</b>

<b>SOPHOMORE YEAR: Fall</b>		<b>Hrs.</b>
ES	1060 .....	3
ES	2120 .....	3
ES	2210 .....	3
MATH	2210 .....	4
PHYS	1220 .....	4
<b>Total Hrs.</b>		<b>17</b>

<b>SOPHOMORE YEAR: Spring</b>		<b>Hrs.</b>
MATH	2310 .....	3
ES	2310 .....	3
ES	2330 .....	3
ES	2410 .....	3
Math/Science Elective <sup>2</sup> .....		3
ATSC	2100 .....	3
<b>Total Hrs.</b>		<b>18</b>

<b>JUNIOR YEAR: Fall</b>		<b>Hrs.</b>
ESE	3005 .....	3
ESE	3020 .....	3
ESE	3040 .....	3
ESE	3060 .....	3
ESE Elective <sup>5</sup> .....		3
<b>Total Hrs.</b>		<b>15</b>

<b>JUNIOR YEAR: Spring</b>		<b>Hrs.</b>
ESE	3160 .....	3
ESE	3360 .....	3
Technical Elective <sup>3</sup> .....		3
PHIL	2330 or 2345 .....	3
Law Elective <sup>4</sup> .....		3
<b>Total Hrs.</b>		<b>15</b>

<b>SENIOR YEAR: Fall</b>		<b>Hrs.</b>
ESE	4060 .....	3
Technical Elective <sup>3</sup> .....		3
Technical Elective <sup>3</sup> .....		3
ENR	3000 .....	3
Human Culture <sup>1</sup> (H) .....		3
<b>Total Hrs.</b>		<b>15</b>

<b>SENIOR YEAR: Spring</b>		<b>Hrs.</b>
ESE	4070 (COM3) .....	3
Technical Elective <sup>3</sup> .....		3
ENR	4900 .....	3
ESE Elective <sup>5</sup> .....		3
Business Elective <sup>6</sup> .....		3
<b>Total Hrs.</b>		<b>15</b>

**Total Hours to BSME Degree: 129**

<sup>1</sup>Approved H course in USP 2015  
<sup>2</sup>Math/Science Electives must be chosen from a Department approved list.  
<sup>3</sup>Four Technical Electives to be chosen from: PETE 2050, Intro to Petroleum Engineering; GEOL 4190, Petroleum Geology; CE 3400, Intro to Environmental Engineering; CE 4430, Environmental Engineering Chemistry; ME 3450, Properties of Materials; ME 4020, Mechatronics; ME 4340, Gas Turbine Engines; ME 4470, Wind and Tidal Energy Engineering; ME 4460, Solar and Geothermal Engineering; ESE 4330, Gasoline and Diesel Engines; ESE 4360, Nuclear Engineering; and ESE 4380 Steam Plant Engineering. Four Business Electives must be chosen from a Department approved list.

<sup>4</sup>Law Elective to be chosen from: ENR 4890, Environmental Law; ENR 4890, ENR Law and Policy; or ENR 4890, Applied GIS.

<sup>5</sup>ESE Electives (2) to be chosen from: ENR 4890, Applied GIS; POLS 4051, Environmental Politics; POLS 4350, Sustainable Development and Global Policy; GEOL 3500, Global Change - A Geologic Perspective; GEOL 3650, Energy - A Geologic Perspective; PETE 4000, Environment, Tech, and Society; ECON 1300, Oil: Business, Culture, and Power; ENR 2000, Environment and Society; and ENR 4890, Economics of Natural Resource Scarcity Wildlife Law and Energy Development.

<sup>6</sup>Business Elective must be chosen from Department approved list.

Degree candidates must meet academic requirements of the college and have a minimum grade point average of 2.00 in all ESE courses completed at UW.

## Energy Systems Engineering (ESE)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

**3020. System Dynamics. 3.** Theoretical and experimental study of the dynamics of linear and non-linear lumped parameter models of mechanical, electrical, electronic, fluid, thermal and mixed systems. Cross listed with ME 3020. *Prerequisites:* ESE/ME 2020, ES 2210, and MATH 2310. (Normally offered fall semester)

**3005 [2010; 2020]. Engineering Experimentation. 3.** A combined lecture/laboratory course introducing students to experimental methods in the context of dynamics. Written technical communication, intermediate structured programming, experimental design, fundamental statistics, and uncertainty methods (numerical and analytical) are emphasized. Collaborative writing and teamwork is introduced. Cross listed with ME 3005. *Prerequisites:* ES 1060; ES 2120; companion course ME 2005.

**3040. Thermodynamics II. 3.** Consideration of advanced thermodynamic topics including Maxwell's relations, compressible flow, and combustion. Applications to design of refrigeration cycles, humidification systems, and Rankine cycles. Cross listed with ME 3040. *Prerequisite:* CHEM 1020 and ES 2310. (Normally offered fall semester)

**3060. Numerical Methods for Engineers. 3.** Numerical solutions of problems commonly encountered in mechanical engineering including differentiation, integration, differential equations, system of linear and nonlinear equa-

tions, and optimization. The structured programming approach will be emphasized and applications from solid mechanics, thermal fluid sciences, materials science, and dynamic systems will be covered. Cross listed with ME 3060. *Prerequisites:* ES 1060; corequisite of MATH 2310.

**3160 [2140; 2160]. Thermal/Fluid Science Lab. 3.** A laboratory course to introduce students to experimental methods for temperature measure and pressure/flow characteristics of fluids. Continuation of experience with communication (written, oral, and digital), intermediate programming, experimental design, data analysis, and teamwork skills is emphasized. Cross listed with ME 3160. *Prerequisites:* ES 2330; ME/ESE 3005.

**3360. Fundamentals of Transport Phenomena. 3.** Basic concepts of heat and mass transfer and their applications to problems involving engineering analysis and design. Topics include steady-state and transient conduction, free and forced convection (heat and mass), radiation and heat exchangers. Cross listed with ME/ARE 3360. *Prerequisites:* ES 2310, ES 2330 and MATH 2310.

**4060. Energy Systems Design I. 3. [(none)♦♦COM3]** First of a two-course design sequence constituting a capstone design experience on an energy-related project. Multidisciplinary teams prepare a project proposal or Statement of Qualifications, generate a morphological study of their project, develop mathematical models of their design, and prepare project plans and specifications. Project management and methods are also presented. *Prerequisites:* ESE/ME 3040 and ESE/ME/ARE 3360 (Normally offered fall semester)

**4070. Energy Systems Design II. 3. [WC♦♦(none)]** Continuation of a two-course design sequence. The design teams refine their designs, fabricate the project, test the project for compliance with the design specifications, write a comprehensive engineering design report including socioeconomic factors, and prepare and deliver a presentation of the project in a public forum. *Prerequisites:* ESE/ME 4060 and WB. (Normally offered spring semester)

**4330. Internal Combustion Engines. 3.** Thermodynamic analysis and design of Otto and Diesel cycles for vehicle applications and stationary power generation. A substantial laboratory component with examine design and manufacturing issues, as well as engine performance in a variety of scenarios. Cross listed with ME 4330. *Prerequisites:* ESE/ME 3040 and ESE/ME/ARE 3360.

**4360. Introduction to Nuclear Energy. 3.** Introduction to the fundamentals of nuclear engineering including power plant design and the fuel cycle. Topics include the fuel cycle and fuel design, reactor physics, reactor theory and design, reactor thermo-hydraulics, radiation protection and safety, and fuel reprocessing and recycling. Cross listed with ME 4360. *Prerequisites:* MATH 2310, ESE/ME 3040, and ESE/ME/ARE 3360.

**4380. Steam Plant Engineering I. 3.** Consideration of detailed component design for major subsystems in steam plants, including various boiler types, steam turbines, coal pulverizers, coal gasifiers, heat exchangers, air heaters, sulfur scrubbers, and ash removal systems. Applications to solar, geothermal, biomass, nuclear, natural gas, and coal-fired plants will be presented. Integration of steam plants in combined cycles and coal gasification cycles will be discussed. Cross listed with ME 4380. *Prerequisites:* ESE/ME 3040 and ESE/ME/ARE 3360.

**4460. Solar and Geothermal Engineering. 3.** An introduction to the engineering of solar-powered energy systems, including evaluation of the energy resource, passive design considerations, economics of active solar systems, design of flat plate collectors and water heating systems, and design of concentrating collectors for larger building or electrical generation applications. Design considerations for geothermal energy systems for both small-scale and commercial-scale applications. Cross listed with ME 4460. *Prerequisite:* ESE/ME/ARE 3360.

**4470. Wind and Ocean Energy Engineering. 3.** Introduction to the harvesting of wind and ocean energy, including discussions of the wind resource, wind turbine aerodynamics, blade materials, turbine dynamics, electrical systems, control systems, and energy storage. An overview of ocean energy capture systems is also presented. Cross listed with ME 4470. *Prerequisites:* ES 2210, ES 2310, ES 2330, and ES 2410.

**4474. Topics in Energy Systems Engineering. 1-3 (Max. 4).** Directed research in mechanical engineering. *Prerequisite:* ME/ESE 2020.

The College of Health Sciences is the place for students interested in improving and maintaining the physical, mental, and social health of others. We offer challenging degree programs in the “helping professions” and serve as the gateway to schools of medicine, dentistry, physical and occupational therapy, physician’s assistant study, and optometry.

Health sciences students receive not only a superior education from knowledgeable and caring faculty but also precise and personal guidance from conscientious advising personnel. Students benefit, too, from practicums and internships that help them refine and test the skills acquired in lectures and labs as well as opportunities to participate in dynamic, interdisciplinary research projects.

The college is also the home of the Wyoming Institute for Disabilities (WIND); the Center for Rural Health Research & Education (CRHRE); the Geriatric Education Center (WYGEC); two Family Medicine Residency Centers; the Wyoming, Washington, Alaska, Montana, and Idaho (WWAMI) medical education contract program, and WYDENT, the dental contract program with the University of Nebraska and Creighton University.

We serve as the state certifying office for the Western Interstate Commission on Higher Education (WICHE) program (refer to the section on WICHE in the first part of this catalog for program description or go to [www.uwyo.edu/hs/wiche-wwami-wydent-program/index.html](http://www.uwyo.edu/hs/wiche-wwami-wydent-program/index.html)).

Any student seeking admission to programs in the College of Health Sciences will be required to obtain a background check as specified by college policy. Please contact your school or division for specific information.

The College of Health Sciences retains the right to deny or revoke admission to any of its programs for academic, disciplinary, ethical, or professionals standards reasons.

ASPIRE! is a program to encourage, promote, and nurture scholarship, leadership, and professionalism in our future health care professionals. ASPIRE! offers one-on-one mentoring and other advantages for a limited number of our students. Check with your program for details.

## Programs of Study

### Undergraduate Degrees

#### Bachelor of Science

- Kinesiology and health promotion
- Medical laboratory science
- Physical education teaching
- Speech, language and hearing sciences

#### Bachelor of Science in Dental Hygiene

#### Bachelor of Science in Nursing

#### Bachelor of Social Work

## Graduate Degrees

### Master of Science

- Nursing
- Kinesiology and health
- Speech-language pathology

### Master of Social Work

## Professional Degrees

### Doctor of Nursing Practice

### Doctor of Pharmacy

## Minors in Health Sciences

Minors in the College of Health Sciences are designed to complement a student’s major and augment educational and employment opportunities. They increase the student’s knowledge of health and human services, and provide him/her with a greater understanding of what it means to work in any aspect of health care.

## Minors in Health Sciences

### include:

#### Health Sciences

This minor is designed for the student who wants to have a career in health care but not necessarily as a provider. Instead s/he may be interested in being an administrator of a hospital or nursing home, a career in public health, or even as a health care practitioner who wants a more complete view of health care.

The minor consists of 18 hours of coursework in a variety of topics that will provide breadth in a student’s background. Check out our web site: [www.uwyo.edu/hs/divisions-and-programs/minor-in-health-sciences.html](http://www.uwyo.edu/hs/divisions-and-programs/minor-in-health-sciences.html).

#### Disability Studies

Disability studies is a diverse interdisciplinary field that investigates broad questions about the nature, meanings, and consequences of disability from interrelated social, historical, cultural, and political perspectives. Students will gain a broad understanding of disability

issues for working with people with disabilities rather than specific disciplinary skills and techniques. The minor consists of 18 credit hours. See [www.uwyo.edu/hs/divisions-and-programs/minor-in-disability-studies.html](http://www.uwyo.edu/hs/divisions-and-programs/minor-in-disability-studies.html).

#### Aging Studies

The field of geriatric health offers opportunities in traditional health care settings and in new settings as we redefine “geriatric care.” The 18 hour interdisciplinary minor consists of core requirements that give a strong background; the electives offer a flexibility that will complement any major. For more information, see <http://www.uwyo.edu/hs/divisions-and-programs/minor-in-aging-studies.html>.

## Undergraduate and Preprofessional Health Advising Office

### Health Sciences Center, 110 & 112

The Undergraduate and Preprofessional Health Advising Office (UPAHO) in the College of Health Sciences ([www.uwyo.edu/pre-prof/](http://www.uwyo.edu/pre-prof/)) provides preprofessional health advising to all UW students regardless of their academic majors, who are interested in pursuing future study in medicine, dentistry, optometry, occupational therapy, physical therapy, physician’s assistant, or other health care careers such as chiropractic. A bachelor’s degree is usually required for admission to a professional school. The University of Wyoming does not offer degrees in preprofessional areas. Students may pursue any UW degree program in which they have an interest and at the same time complete the admission requirements for the professional schools they wish to attend. The UPAHO advises students for their professional program prerequisites as well as other aspects of becoming solid candidates. Each student will also have an adviser in his/her major for advising in the major.

Current information about admission requirements, entrance examinations, application process, professional school curriculums, interviewing skills, and test preparation is available. Current admissions data and addresses for specific schools are available. Specific schools may have additional requirements; students are urged to check with the schools they wish to attend.

Information and residency applications for the WICHE programs, the WWAMI medical education program, and WYDENT, the dental

education program, may be found online at [www.uwyo.edu/hs/wiche-wwami-wyident-program/](http://www.uwyo.edu/hs/wiche-wwami-wyident-program/).

## Health Sciences (HLSC)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**1010. Exploring the Health Sciences. 2. [I,L♦(none)]** Introduce philosophy of higher education, academic expectations of Health Sciences, and value system of health-related disciplines, especially issues related to cultural awareness and interprofessional collaboration. Students are expected to develop critical thinking, communication, and information literacy skills and to use skills to better understand issues related to healthcare disciplines.

**1020. Intellectual Community: Women in Sports. 3. [I,L♦(none)]** Provides an overview of the role of American women in sports. Studies concepts about women, sports, and society in contemporary and historical perspectives. Topics include: history of women in sports, physiological, social and cultural considerations, media image, and careers. Cross listed with WMST 1020.

**1090. SPARX: Topics in Interdisciplinary Health Care. 1 (Max. 3).** Each semester a different topic or disease state is highlighted. Using film, lectures, and selected readings, students are introduced to interdisciplinary collaboration between health care and mental health professionals. Benefits to patient care and barriers in making interdisciplinary connections are addressed.

**1101. First-Year Seminar. 3. [(none)♦FYS]**

**3250. Health and Illness in American Religious Life. 3.** A cross-cultural study of the connections between religion and health. Students learn to appreciate and analyze the role different religions play in understanding health and illness, as well as the role religions can play in the context of modern medicine. *Prerequisite:* junior standing or permission of instructor.

**4020. SPARX: Advanced Topics in Interdisciplinary Health Care. 1 (Max 3).** Interdisciplinary collaboration for improved health outcomes is the focus of this class. Students develop a deeper understanding of the benefits and difficulties that exist for interdisciplinary teams. *Prerequisites:* At least two upper-division courses in CHS, may be taken concurrently.

**4030. Experiences in Community Health Service. 0.** Students will be advised and guided by faculty in the College of Health Sciences in providing health related community services. Activities will vary and include but are not

limited to participation in health screenings, providing programs at senior housing, working with the Wyoming Geriatric Education Center, participating in CHAP activities, etc. *Prerequisite:* Upper division status (junior or senior) or current enrollment in a professional program in the College of Health Sciences and permission of instructor.

**4040. Service Learning in Healthcare Training. 1.** Provides an opportunity for students to discuss, reflect upon and learn from their community-based experiences. Students also consider the broader implications of becoming a reflective practitioner, working within a healthcare team and the benefits of interprofessional collaboration. *Prerequisites:* involvement in CHAP; upper division standing.

**4100. Global Public Health. 3. [G♦(none)]** Introduces students to the global context of public health, to principles underlying global health, and to dimensions of public health particular to international settings. It examines major themes and policies in global health and analyzes health problems and varying responses to them in different parts of the world. Dual listed with HLSC 5100; cross listed with INST 4100. *Prerequisite:* upper division student status.

**4310. Foundations of Scholarship and Discovery. 1 (Max. 3).** An interdisciplinary discussion based exploration of the nature and creation of knowledge, principles underpinning creativity, inquiry, skepticism, critical analysis, the insecurity of discovery on the frontiers of knowledge, and ethical decision-making. Examines the path from novice to expert thinker and creativity at discipline boundaries. Cross listed with MOLB 4310. *Prerequisites:* completion of USP WB requirement and junior standing.

**4520. Public Health Issues in Developing Countries. 2. [G♦(none)]** Fundamental principles and practices of public health systems in developing countries will be presented including epidemiology, etiology, integrated management, will be presented within the context of globalization, climate change, and socio-economic, political and cultural constraints. Principles will be illustrated by case studies of major health issues in an interdisciplinary, holistic manner. Cross listed with MOLB 4520. *Prerequisite:* LIFE 1010, upper division or graduate standing and consent of instructor.

**4530. Global Experience in Public Health. 2.** A three week inter-semester service learning experience in a developing country. Students will participate, in collaboration with in-country healthcare professionals, in a defined public health education and research program designed to address major public health chal-

lenges. Students will gain a global perspective within the cultural context of the developing nation. Cross listed with MOLB 4530. *Prerequisites:* HLSC/MOLB 4520 and consent of instructor.

**4700. Health Information Technology. 3.** Provides skills to conceptualize, design, and use computer and telecommunications systems to promote best practices and provide quality health care. Design a technology-based approach to one or more health care problems, building on complimentary knowledge of interdisciplinary team members. *Prerequisite:* USP (L); senior or graduate status in Health Sciences, Business, or Engineering and Applied Science.

**4970. Interdisciplinary Seminar in Health Sciences. 3.** An interdisciplinary seminar designed to explore research, skills, roles and preparation of all health care professionals to gain a better understanding of the unique contribution each makes to interdisciplinary practice. *Prerequisites:* completion of 24 hours in College of Health Sciences; senior standing. (Normally offered spring semester)

**4985. Health Sciences Internship. 1-6 (Max. 6).** Gives students an opportunity to gain practical experience in a health care field of their choice. The intense relationship with a mentor allows the student to become socialized into a health care field, gain practice skills, and relate to other health care professionals in an interdisciplinary way. For S/U Only. *Prerequisite:* completion of all other degree requirements. (Offered fall, spring and summer)

**4990. Current Topics in the Health Sciences. 1-6 (Max. 12).** Provides upper division/graduate students with the opportunity for critical analysis and in-depth examination of various current topics in health science fields. *Prerequisites:* twelve hours in College of Health Sciences coursework, or in field related to the topic, or admission to a professional program within the College of Health Sciences. Individual topics courses may require specific course(s) as prerequisite. Contact the instructor for specific information. Dual listed with HLSC 5990.

**5100. Global Public Health. 4.** Introduces students to the global context of public health, to principles underlying global health, and to dimensions of public health particular to international settings. Examines major themes and policies in global health and analyzes health problems and varying responses to them in different parts of the world. Dual listed with HLSC 4100; cross listed with INST 5100. *Prerequisite:* upper division or graduate standing.

**5990. Topics In Health Sciences. 1-6 (Max. 12).** Provides upper division/graduate student with the opportunity for critical analysis and in-depth examination of various current topics in health sciences fields. *Prerequisite:* graduate standing.

## Dental Hygiene

The University of Wyoming and Sheridan College offer a cooperative program of dental hygiene education which, when completed, results in two degrees. An Associate of Applied Science degree in dental hygiene is awarded by Sheridan College following completion of the prerequisites and dental hygiene prescribed study. An optional Bachelor of Science in Dental Hygiene degree is awarded by the University of Wyoming following completion of the Associate of Applied Science in dental hygiene, the University Studies Program, and other requirements of the University of Wyoming, for a total of 128 credit hours including 42 upper level hours, 30 of which must be from the University of Wyoming. See [www.uwyo.edu/hs/divisions-and-programs/dental-hygiene-programs.html](http://www.uwyo.edu/hs/divisions-and-programs/dental-hygiene-programs.html).

The American Dental Association has awarded full accreditation to the Associate of Applied Science degree in dental hygiene at Sheridan College. Graduates are eligible to take the National Board of Dental Hygiene exam, as well as regional and state exams for licensure, as registered dental hygienists.

Applicants should visit [www.sheridan.edu/site/sc/academics/programs-and-majors/dental-hygiene](http://www.sheridan.edu/site/sc/academics/programs-and-majors/dental-hygiene) for specific prerequisites and application materials. Applications are due to Sheridan College prior to February 15 of the year they wish to enter the program. Class sizes are limited. Admission is contingent upon successful completion of a background check.

## Learning Outcomes

The primary objective of the program is to assure that graduates have knowledge and abilities necessary to successfully practice dental hygiene.

All prerequisite coursework must be completed with a cumulative grade point of 2.5 (on a 4 point scale). Science courses must be current within five years at the time of application to Dental Hygiene professional program. Completion of the prerequisite courses does not guarantee admission to the professional program. Students must also complete a minimum of 20 hours of dental hygiene observation prior to application.

## Bachelor's Degree in Dental Hygiene Requirements

See <http://www.uwyo.edu/hs/divisions-and-programs/dental-hygiene-program.html> for a four year plan and a list of program prerequisites.

1. Program prerequisites,
2. A.A.S. in Dental Hygiene from Sheridan College,
3. Completion of all University of Wyoming requirements,
4. STAT 2050 or STAT 2070, and
5. At least 120 credit hours.

Students interested in the bachelor's degree in dental hygiene should contact the Undergraduate and Preprofessional Health Advising Office in the Health Sciences Center, rooms 110 and 112, or phone (307)766-6704 or (307)766-3499. E-mail: [denthygiene@uwyo.edu](mailto:denthygiene@uwyo.edu) or visit <http://www.uwyo.edu/hs/divisions-and-programs/dental-hygiene-program.html>.

## Dental Hygiene (DHYG)

**3230. Clinical Seminar II. 2.** An adjunct to the clinical dental hygiene course devoted to the development and nurturing of skills needed for treatment of more advanced periodontal cases, including initiation of a periodontal case study. Also included will be an introduction and preparation for the use of state-of-the-art clinical technologies. *Prerequisite:* DHYG 2420. (Normally offered fall semester)

**3250. Clinical Seminar III. 2.** Prepares dental hygiene students to make transitions from an educational setting to private practice. Covers range of subjects enabling students to meet challenges associated with variety of patient care issues, including meeting needs of the elderly. Discusses various dental specialty practices. *Prerequisites:* DHYG 3230, 3300 and 3350 or concurrent enrollment. (Normally offered spring semester)

**3300. Clinical Dental Hygiene II. 5.** Students gain further practical experience in dental hygiene procedures by providing comprehensive patient care in the Sheridan College and Veterans' Administration Medical Center clinics. A flexible, self-paced format allows students to meet requirements in procedures for patient record-keeping, patient education, dental prophylaxis, dental radiography and other routine clinical procedures. *Prerequisite:* DHYG 2350. (Normally offered fall semester)

**3350. Clinical Dental Hygiene III. 5.** Allows students to garner practical experience in clinical procedures requiring greater skill and

more knowledge than procedures previously undertaken. Students successfully completing this course are fully prepared for transition to office practice. *Prerequisite:* DHYG 3300. (Normally offered spring semester)

**3400. General and Oral Pathology. 3.** Designed to teach students concepts underlying general and oral manifestations of human disease states, manifestations of specific diseases, relationships to body defense mechanisms, and potential implications of medical and dental hygiene treatment. To the extent possible, applications to clinical situations in dental hygiene practice are made. *Prerequisites:* one year pre-dental hygiene (including general pathology); MOLB 2021 or equivalent. (Normally offered fall semester)

**3550. Community Dental Health. 3.** Introduces basic skills needed to assess, plan and implement strategies to evaluate the dental health of the community, including research methodology and basic statistical analysis. Provides students with basic understanding of significant social, political, psychological and economical factors influencing the American Health Care System. *Prerequisite:* DHYG 2100. (Normally offered spring semester)

**3600. Ethics and Law in Dental Hygiene. 2.** Core principles in ethics and values as they relate to the professional code of conduct and state jurisprudence. Students explore contemporary issues within a diverse society in understanding and applying a personal value system to issues in the dental hygiene profession. *Prerequisite:* successfully complete all first-year dental hygiene courses.

**3720. Office Practice. 2.** Provides students with current information and experience in office practice and management. Discusses professionalism; office leadership roles; legal responsibilities; team responsibilities in dental offices; and selecting, securing and maintaining satisfying employment. *Prerequisites:* DHYG 2300, 2350, 3300 and a communications course. (Normally offered spring semester)

**3750. Periodontology. 3.** Briefly reviews anatomy and histology of periodontal structures and dental accretions. Studies classifications and etiology of periodontal diseases, including local and systemic factors. Thoroughly explores the hygienist's role in disease recognition, prevention, therapeutic procedures and maintenance. (Normally offered fall semester)

**3770. Pain Management. 2.** Provides a comprehensive background for performing field infiltration, nerve block anesthesia and nitrous oxide/oxygen inhalation sedation. *Prerequisite:* successful enrollment in dental hygiene major or consent of instructor. (Normally offered fall semester)

**3775. Pain Management Lab. 1.** Taken concurrently with DHYG 3770 Pain Management. Provides opportunities to apply principles learned. Clinical laboratory experiences includes practice, demonstrations and evaluation of pain management techniques. *Prerequisites:* successful completion of sophomore year course work in dental hygiene, current certifications in CPR, and curriculum enrollment in dental hygiene major or consent of instructor. (Normally offered fall semester)

**3800. Board Review. 1.** Designed to assist dental hygiene students in preparing for the National Board Dental Hygiene Exam, the western and central regional clinical and anesthesia board exams, and state jurisprudence exams. These exams are required for licensure to practice dental hygiene in the United States. *Prerequisite:* DHYG 3300.

**4850. Education Practicum in Dental Hygiene. 6.** Allows students to experience both clinical and didactic elements of dental hygiene teaching. *Prerequisites:* completion of dental hygiene didactics, all requirements of program. Final course of program. (Offered both semesters)

## Division of Communication Disorders

265 Health Sciences, 766-6427

**FAX:** (307) 766-6829;

**Web site:** www.uwyo.edu/comdis

**Director:** Teresa Ukrainetz

### Professors:

**MARY HARDIN-JONES**, B.A. Texas Tech University 1978; M.S. 1979; Ph.D. University of Iowa 1984; Professor of Speech-Language Pathology 2005, 2001.

**DAVID L. JONES**, B.S. Westminster College 1980; M.A. University of Iowa 1983; Ph.D. 1987; Professor of Speech-Language Pathology 2005, 2001.

**TERESA A. UKRAINETZ**, B.A. University of Calgary 1984; M.S. University of British Columbia 1987; Ph.D. University of Texas at Austin 1995; Director, Division of Communication Disorders 2008; Professor of Speech-Language Pathology 2007, 1995.

### Associate Professors:

**MARK GUIBERSON**, B.A. University of Colorado 1997; M.A. 1999; Ph.D. Colorado State University 2006; Associate Professor of Speech-Language Pathology 2014, 2011.

**ROGER W. STEEVE**, B.A. San Diego State University 1990; M.A. 1993; Ph.D. University of Washington 2004; Associate Professor of Speech-Language Pathology 2011, 2005.

### Assistant Professors:

**ERIN J. BUSH**, B.S. University of Wyoming 2000; M.S. University of Nebraska-Kearney 2003; Ph.D. University of Nebraska-Lincoln 2011; Assistant Professor of Speech-Language Pathology 2015.

**MARY JO C. HIDECKER**, B.A. University of Iowa 1981; M.A. 1984; Ph.D. Michigan State University 2004; M.S. 2011; Assistant Professor of Audiology and Speech-Language Pathology 2013.

**DOUGLAS B. PETERSEN**, B.A. Utah State University 1999; M.Ed. 2002; Ph.D. 2010; Assistant Professor of Speech-Language Pathology 2010.

### Academic Professionals:

**TODD L. CORBETT**, B.A. University of Wyoming 1993; M.A. Lewis & Clark College 1994; Associate Lecturer 2006, 1999.

**LYNDA D. COYLE**, B.A. Holy Names College 1981; M.S. University of Wisconsin-Eau Claire 1982; Senior Lecturer 2007, 1999.

**JASON CUSTER**, B.S.W. University of Wyoming 2012; Assistant Lecturer 2014.

**CHRISTIANE DECHERT**, B.A. Georg August Universität 1979; M.A. University of Arizona 1982; M.A. Washington State University 1997; Associate Lecturer 2010, 2002.

**TERESA J. GARCIA**, B.S. University of Wyoming 1989; M.S. 1991; Associate Lecturer 2004, 1995.

**CATHERINE L. ROSS**, B.S. Missouri State University 1973; M.S. University of Wyoming 1999; Associate Lecturer 2014, 2008.

**AMY M. WEAVER**, B.S. University of Wyoming 1997; M.S. 2001; Associate Lecturer 2010, 2004.

### Adjunct Clinical Instructors:

Anna Anderson, M.S., CCC-SLP

Cynthia Anderson, M.S., CCC-SLP

Kathe Dahill, M.S., CCC-SLP

Susie Fornstrom, M.S., CCC-SLP

Lealani Kersenbrock, M.S., CCC-SLP

### Professors Emeriti:

Janis A. Jelinek

Douglas W. Laws

Michael A. Primus

The areas of speech-language pathology and audiology are concerned with disorders of communication. Included in these areas are the studies of systems underlying the normal communicative process (phonetics, acoustics, neurology, anatomy and physiology); development of speech, hearing and language functions; deviations from the normal

communicative process; and diagnosis and management of speech, language and hearing disorders.

The Division of Communication Disorders offers a bachelor's (B.S.) degree in speech, language and hearing science. The bachelor's degree is considered preprofessional preparation for entrance into a graduate program in either speech-language pathology or audiology. A graduate degree is needed to work in most employment settings. The division offers a Master of Science degree in speech-language pathology. The combined undergraduate and graduate programs are designed to prepare students to meet the academic and clinical requirements for Wyoming licensure and the Certificate of Clinical Competence awarded by the American Speech Language Hearing Association.

The graduate program in speech-language pathology is accredited by the Council of Academic Accreditation of the American Speech-Language-Hearing Association (ASHA). See the division web site for additional information.

Any student seeking admission to the graduate program in Speech-Language Pathology within the Division of Communication Disorders will be required to obtain a background check as specified by college policy.

## Undergraduate Learning Outcomes

The B.S. in Speech, Language, and Hearing Science provides a quality pre-professional education in human communication sciences and disorders. Students graduate with the knowledge and skills needed to go on to further education in professional programs in speech-language pathology, audiology, and to other careers in health and education. Program quality is monitored and maintained through regular examination of the results of direct and indirect measures of teaching and learning goals.

Students earning a B.S. in Speech, Language, and Hearing Science will demonstrate competencies in the following areas within (a) human communication and swallowing, (b) clinical knowledge and skills, and (c) communication and professionalism.

- A. Core Competencies in Human Communication and Swallowing Science
  1. Anatomical and physiological bases of communication and swallowing
  2. Neurological bases of communication and swallowing

- 3. Acoustic and articulatory bases of communication
  - 4. Psychological and linguistic bases of communication
  - 5. Social and cultural bases of communication
  - 6. Research methods used in the field of communication disorders
- B. Introductory Clinical Knowledge and Skills**
- 1. Nature of hearing and balance disorders
  - 2. Remediation of hearing and balance disorders
  - 3. Nature of speech and swallowing disorders
  - 4. Nature of language and literacy disorders
  - 5. Principles and methods of assessment and treatment
  - 6. Phonetic transcription and language sample analysis of typical speakers
- C. Basic Competencies in Communication and Professional Areas**
- 1. Scholarly and professional written expression
  - 2. Scholarly and professional oral expression
  - 3. American Sign Language or other second language
  - 4. Locating and evaluating resources for evidence-based practice
  - 5. Problem-solving and critical thinking
  - 6. Self-regulation and meta-cognition
  - 7. Interpersonal interactions and teamwork
  - 8. Behavior conforming to academic and professional ethical standards

**Suggested Course Sequence**

<b>FRESHMAN YEAR: Fall</b>		<b>Hrs.</b>
USP FYS Course	.....	3
ENGL 1010	.....	3
SPPA 1010	.....	3
PSYC 1000	.....	3
LIFE 1010	.....	4
<b>Total Hrs.</b>		<b>16</b>

<b>FRESHMAN YEAR: Spring</b>		<b>Hrs.</b>
USP H Course	.....	3
MATH 1400 (or MATH 1450)	.....	3
PHYS 1050	.....	4
POLS 1000	.....	3
Elective	.....	3
<b>Total Hrs.</b>		<b>16</b>

<b>SOPHOMORE YEAR: Fall</b>		<b>Hrs.</b>
KIN 2040	.....	3
KIN 2041	.....	1
SPPA 2210	.....	3
SPPA 2110	.....	4
USP H Course	.....	3
SPPA 2250	.....	1
PEAC 1001	.....	1
<b>Total Hrs.</b>		<b>16</b>

<b>SOPHOMORE YEAR: Spring</b>		<b>Hrs.</b>
FCSC 2121	.....	4
SPPA 2120	.....	4
USP COM1 Course	.....	3
Elective	.....	1
<b>Total Hrs.</b>		<b>12</b>

<b>JUNIOR YEAR: Fall</b>		<b>Hrs.</b>
SPPA 3265	.....	3
USP Q Statistics Course	.....	4
USP COM2 Course	.....	3
Elective	.....	3
Elective	.....	3
<b>Total Hrs.</b>		<b>16</b>

<b>JUNIOR YEAR: Spring</b>		<b>Hrs.</b>
SPPA 4310	.....	3
SPPA 3160	.....	3
Atypical (PSYC 4310, 4320, CNSL 4520)	.....	3
Elective (3000/4000 level)	.....	3
Elective	.....	3
<b>Total Hrs.</b>		<b>15</b>

<b>SENIOR YEAR: Fall</b>		<b>Hrs.</b>
SPPA 4380	.....	3
Elective (3000/4000 level)	.....	3
SPPA 4340	.....	3
SPPA 4750 (COM3)	.....	3
Elective (3000/4000 level)	.....	3
<b>Total Hrs.</b>		<b>15</b>

<b>SENIOR YEAR: Spring</b>		<b>Hrs.</b>
SPPA 4150	.....	3
SPPA 4240	.....	3
SPPA 4250	.....	3
SPPA 4220	.....	3
Elective (3000/4000 level)	.....	3
<b>Total Hrs.</b>		<b>15</b>

**Total hours in curriculum and required for degree** 121

**Hours required in 3000/4000-level courses** 42

**Note:** a grade of C- or better must be earned in all SPPA courses; courses in the major must be taken for a letter grade unless offered for S/U only. SPPA 2120 can be substituted for by a Modern Language.

**Speech and Hearing Clinic**

Speech and hearing clinical services are available to University of Wyoming students. For information concerning these services, contact the Division of Communication Disorders.

There is a student organization with whom speech-language pathology and audiology majors may choose to affiliate, the National Student Speech-Language and Hearing Association. Objectives are to promote and recognize scholastic achievement and to support clinical, research, and service endeavors.

**Graduate Study**

**Admission to the M.S. Degree Program in Speech-Language Pathology**

**Admission Requirements**

Admission to the master's program in speech-language pathology is made on a competitive basis. Students can apply for the campus or distance tracks (see our web site for a program description). We accept students to start in the fall of each year. Minimum requirements for full admission to the master's program in speech-language pathology are the following:

**1. Academic Transcripts**

Official transcripts from all universities and colleges attended must be submitted. These must show progress toward completion of a bachelor's degree and coursework in communication disorders. An undergraduate grade point average (GPA) of at least 3.0 (4.0 scale) is required for full admission. Grades for the fall courses and enrollment in the spring courses prior to application should be present on the transcripts. An official transcript showing completion of the bachelor's degree will be required by the first semester of graduate study.

**2. Communication Disorders Coursework**

Official transcripts showing undergraduate coursework in communication disorders are required. See the Division web site for the recommended and required coursework (Leveling).

**3. GRE Report**

Official report of Graduate Record Examination (GRE) Quantitative, Verbal, and Writing scores must be submitted. A cumulative score of at least 291 (900 minimum score with the old GRE) on the verbal and quantitative sections is required for full admission. The



Division requires all applicants to report their GRE score, regardless of whether they already have a graduate degree.

#### 4. Recommendation Letters

Three letters of recommendation must be submitted. At least two of the letters should be from previous instructors who are familiar with the applicant's academic performance and can address potential for success in graduate school.

#### 5. Candidacy Statement

A candidacy statement must be submitted. It consists of a short essay on the applicant's qualifications for a graduate degree in speech-language pathology. See the division website for the statement prompt instructions.

#### 6. Campus or Distance

Applicants must state which track is desired at the beginning of the candidacy statement: on-campus or distance. Students cannot mix the tracks, but can be considered for either or both. See the web site for descriptions of the two tracks.

#### 7. TOEFL

International students from non-English-speaking countries need a TOEFL score of 600 to show English proficiency. Additional sources of evidence may be requested by the division to make a final decision. English proficiency must be sufficient for success in graduate school and certification as a speech-language pathologist in the United States, even if the applicant intends to return to the native country.

#### Conditional Status

An applicant may be admitted conditionally if he or she does not meet the GPA or GRE requirements for full admission, and the Division determines that there are sufficient areas of strength for success in graduate school in comparison to other applicants. Conditions will be placed on admission such as graduate grade point average, performance criteria, or completion of certain courses.

#### Application Procedure

Applications to our master's program must be made through an electronic, centralized application service: the Communication Sciences and Disorders Centralized Application Service for Clinical Education in Audiology and Speech Language Pathology (CSDCAS). Instructions and application procedures are available at <https://portal.csdcas.org>. Check the division web site in October for current instructions and deadlines.

Applicants will be notified of the division's decision on acceptance, alternate, or denial by mid-March. Applicants must respond to the offer by April 15. Alternates will be offered positions that become available after April 15.

International students should submit their application materials directly to the University of Wyoming not to CSDCAS (except Canadians, who use CSDCAS). Applicants must have transcripts translated and assessed for equivalency to the American university system to be considered for admission. In addition, for International (including Canadian), the university must determine whether financial resources are sufficient for study here.

#### Requirements Following Offer of Admission

Students who accept an offer of admission to the program must then apply to the university for formal admission.

#### Criminal Background Check

Admission to the graduate program in speech-language pathology is contingent upon passing a criminal background check. Each student recommended for admission into program will be required to obtain, pay, and pass a criminal background check. These background checks are routinely required by schools, hospitals, and other agencies that participate in the clinical education of our students. The results of the background check may determine admission to our program. Please see the College of Health Sciences web site for the policy and procedures document.

#### Program Specific Graduate Assistantships

Financial help for graduate students is available each year through the department with assistantships and other funding. Typically, graduate assistantships include one-half tuition support and a monthly stipend. These assistantships require the student to spend 10 hours per week assisting faculty members in teaching and research.

Awards are competitive and based on past academic performance, evidence of professional promise, and letters of recommendation.

Graduate assistantships are only awarded to campus applicants with full admission.

#### Program Specific Degree Requirements Master's Programs

The graduate program consists of a minimum of 50 SCH of academic coursework, on-campus clinical practica, and external clinical practica. Students may pursue either a thesis or non-thesis track during their graduate studies.

Both tracks lead to eligibility for the Certificate of Clinical Competence in Speech-Language Pathology (CCC-SLP), granted by the Clinical Certification Board of the American Speech-Language-Hearing Association. Graduates are also eligible for the Wyoming license in speech-language pathology. A supervised Clinical Fellowship Year (CFY) is required beyond the graduate degree for certification. The master of science program in speech-language pathology is accredited by the Council of Academic Accreditation of the American Speech-Language-Hearing Association.

#### Plan A (thesis) (57 hour program)

Speech-Language Pathology

33 hours of graduate academic coursework

20 hours of graduate clinical practicum (clinical track)

4 hours of 5960 thesis research

#### Plan B (Non-thesis) (54 hour program)

Speech-Language Pathology

33 hours of graduate academic coursework

20 hours of graduate clinical practicum (clinical track)

1 hour 5961 comprehensive examination

#### Upon completion of the M.S. in Speech-Language Pathology, students will meet knowledge and skill competencies within the following standards

- A. In academic coursework, students will demonstrate knowledge of:
  1. Basic human communication and swallowing processes, including their biological, neurological, acoustic, psychological, development, linguistic and cultural bases
  2. Etiologies and characteristics of communication and swallowing disorders in the areas of articulation, stuttering, voice and resonance, language, hearing, swallowing, cognition, social aspects, and communication modalities
  3. Principles and methods of prevention, assessment and intervention for people with communication and swallowing disorders
- B. In clinical education, students will demonstrate knowledge and skills in:
  1. Planning and execution of evaluation and treatment at an appropriate level of independence

2. Professional comportment and culturally-sensitive clinical practices
3. Competent clinical writing

C. At the conclusion of the graduate program, students will demonstrate preparation for entry into clinical practice by:

1. Successful completion of external clinical practica
2. Passing the oral comprehensive examination
3. Passing a national clinical certification examination

To see specific competencies, refer to the Grad Handbook on the Division website.

### Distance Learning Program

The University of Wyoming Division of Communication Disorders offers a distance master's degree program and leveling course work in speech-language pathology. The program is open to both resident and nonresident students. Refer to the division Web site for current information and the Outreach School for course registration.

### Leveling Coursework

Leveling is completed on a course-by-course basis, not as part of a degree program. Students sign up for leveling courses as non-degree undergraduate (NDU) each semester that they take only undergraduate courses. Any semester in which a student takes a graduate class (numbered 5000 or above), the student must change status to non-degree graduate (NDG). This allows the graduate courses to be applied to the master's program at a later date. Fees and tuition for all the coursework in that semester are charged at the graduate student rate. Refer to the division Web site for a list of courses.

### Continuing Education

Students may take graduate coursework as continuing education without having been admitted to the graduate program. If students are accepted at a later date into the graduate program, they may apply a maximum of 12 graduate credit hours earned as a non-degree student toward their graduate degrees. Coursework submitted must be approved by the division at the time the official program of study is submitted. Coursework may not be older than 6 years from time of master's graduation.

### Course Transfers and Waivers

In accredited programs of speech-language pathology, evaluation involves both course grades and demonstration of specific knowledge and skills. As a result, for any course

transferred, waived, or applied from non-degree status, evidence of the knowledge and skills linked to that course will still be required.

## Speech-Language Pathology (SPPA)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

**1000. Orientation to Communication Disorders. 3.** Acquaints students with professions of speech-language pathology and audiology. Provides students with opportunity to complete University Studies Orientation requirement.

**1010. Introduction to Communication Disorders. 3. [I,L♦(none)]** Introduces information regarding basics of speech and hearing. Discusses disorders of speech and hearing by defining the problem, etiology or theories of cause, classifications and controversies, evaluation techniques and therapies to correct the disorder.

**2110 [4100]. American Sign Language I. 4.** Basic comprehension and expression of American Sign Language (ASL), the language used by the Deaf community in the United States. ASL vocabulary, grammar, and pragmatics are taught through lecture, conversation, and storytelling. The direct experience method (using ASL with no voice) is utilized to enhance the learning process. (Offered fall, spring and summer)

**2120 [4120]. American Sign Language II. 4.** Second level of ASL comprehension and expression. ASL vocabulary, grammar, and pragmatics, along with increased fluency, are taught through lecture, conversation, and storytelling. Translation from English to ASL is addressed. *Prerequisite:* SPPA 2110.

**2210 [3210]. Phonetics and Phonological Development. 3.** Articulatory description of speech sound production and normal phonological development. Introduction to the International Phonetic Alphabet and speech transcription skills. *Prerequisite:* SPPA 1010.

**2250. Clinical Observation. 1.** Students obtain a minimum of 10 approved observation hours of live and recorded speech-language pathology and audiology services. Weekly class meetings will discuss the communication disorders and assessment/treatment activities observed. ASHA Code of Ethics, HIPAA procedures, and observer requirements (e.g., background checks, TB screen) will be conducted. *Prerequisite:* SPPA 1010.

**3160 [4160]. Language Development. 3.** Deals with the development of semantics, syntax, morphology, discourse, and pragmat-

ics for typically-developing children from infancy to adolescence. Includes relinguistic and paralinguistic communication, the cognitive correlates of communication, and written language. Considers the effects of sociocultural context and multiple language acquisition. *Prerequisite:* SPPA 1010.

**3265 [3400]. Anatomy and Physiology of Speech, Swallowing and Hearing. 3.** Introduces the student to the anatomy of the normal speech and hearing systems as well as the physiologic underpinnings of the speech (respiration, phonation, articulation), swallowing, and hearing (external, middle, and inner ear) systems. Theories of speech production and speech perception are presented. *Prerequisites:* KIN 2040.

**4000. Workshop in Speech Pathology/Audiology. 1-8 (Max. 8).** Varies with interests of student requests. Incorporates material relative to any area of speech and hearing. *Prerequisite:* consent of instructor. (Offered based on sufficient demand and resources)

**4070. Deaf Studies. 3. [CS,D♦(none)]** Studies deaf culture and deaf history in the United States. Culture topics will include deaf community dynamics, humor, behavior, emotional and social interaction, besides issues involving deaf children as a linguistic minority. History will be discussed from the 1700s to the present in the U.S. *Prerequisites:* SPPA 2110.

**4130. Advanced ASL. 4.** Third level of ASL comprehension and expression. Addresses increased fluency in ASL; register variation for different conversational participants; and specialized vocabulary, including sexuality and religion. Translation from English to ASL is addressed. *Prerequisites:* SPPA 2120.

**4140. American Sign Language Assistant. 1-4 (Max 12).** To improve and retain signing skills through assisting instructor in Beginning/Intermediate Sign Language courses, facilitating students in Sign Language Labs, providing individual student assistance, and participating in outside activities. One semester credit hour requires 4 hours of work per week. Satisfactory/Unsatisfactory only. *Prerequisites:* consent of instructor and SPPA 2120. (Offered fall, spring and summer)

**4150. Aural Rehabilitation. 3.** Examines basis for and characteristics of communication problems created by hearing loss and management procedures to facilitate communication and adjustment to hearing loss. Includes acoustic and visual properties of speech, amplification devices and hearing loss in school children. Dual listed with SPPA 5150. *Prerequisite:* SPPA 4340.

**4220. Speech Disorders Across the Lifespan. 3.**

The nature and causes of developmental and acquired speech disorders across the lifespan are examined. Topics include developmental speech sound disorders, apraxia, stuttering, dysarthria, voice disorders and other disordered speech populations. Principles of assessment and remediation are introduced. *Prerequisite:* SPPA 3265 and 4160.

**4240. Language Disorders Across the Lifespan. 3.**

The nature and causes of developmental and acquired language disorders across the lifespan are examined. Topics include the behavioral and linguistic characteristics of specific language impairment, intellectual disability, autism, traumatic brain injury, right hemisphere trauma, aphasia, and dementia. Principles of assessment and remediation are introduced. *Prerequisites:* SPPA 3265, SPPA 4160.

**4250. Clinical Methods. 3.** Introduction to procedures of intervention and evaluation: writing observation reports, goals and objectives, treatment notes, data collection and analysis, ASHA Code of Ethics, treatment planning, interviewing, and counseling. Clinical observation of speech-language pathology and audiology services will occur. Observer requirements (e.g., background checks, TB screen) must be met. *Prerequisites:* senior standing or consent of instructor. (Normally offered fall semester)

**4310. Acoustics of Speech and Hearing. 3.**

Study of 1) the nature of sound and 2) normal speech and hearing processes. Topics include characteristics of simple and complex sound, sound travel in the environment, psychoacoustics, speech perception, speech production, and analysis of sound in humans. *Prerequisite:* SPPA 3265.

**4340. Basic Audiology. 3.** An introduction to audiology as a profession, with primary focus on screening and diagnostic methods for the clinical evaluation of hearing loss in children and adults. *Prerequisites:* SPPA 3265. (Normally offered spring semester)

**4380. Neurological Basis of Communication. 3.**

Studies details of human nervous system, including central and peripheral nervous systems, major motor and sensory pathways and special senses. Emphasizes neurology of various communication disorders. *Prerequisites:* SPPA 3265.

**4500. Early Childhood: Language Development and Disorders. 3.**

Encompasses development of normal children's linguistic abilities. Presents concomitant motor, cognitive and social development; instructional procedures to facilitate language development; and effect of various disabilities on develop-

ment of the communicative system of the child. Course cannot be substituted for SPPA 4160, 4240 or 5160. *Prerequisites:* minimum of junior standing and consent of instructor.

**4750. Research Methods in Communication Disorders. 3. [WC◀COM3]**

Deals with scientific investigation of normal, disordered, and intervention aspects of speech, language, and hearing. Topics include evaluating and synthesizing published research, research writing, research design, and data analysis techniques. The aims are to develop writing competence within the discipline, to create research-aware clinicians, and to introduce students to research careers. *Prerequisite:* STAT 2070.

**4890. Independent Study. 1-3 (Max. 4).**

An independent study will be developed by the instructor and undergraduate student. It will consist of activities such as: conducting a small research project, assisting in a research project, composing a systematic research review, participating in a clinical experience, or helping to develop a professional development or public awareness program. *Prerequisite:* prior or concurrent enrollment in SPPA 3210.

**5000. Seminar in Communication Disorders. 1-8 (Max. 8).**

The participation in and discussion of special problems and/or research related to speech-language, pathology and audiology. *Prerequisite:* B.S. degree and consent of instructor.

**5020. Phonological Assessment and Intervention. 3.**

Emphasis on normal phonetic and phonologic development, diagnosis and clinical management of articulatory and phonological disorders. *Prerequisite:* SPPA 3210.

**5030. Clinical Practicum. 1-4 (Max. 8).**

Supervised clinical experience with speech, language, and hearing disordered children and adults under supervision of University of Wyoming Speech and Hearing Clinic faculty. *Prerequisite:* matriculating graduate students only.

**5090. American Sign Language III. 4.**

Translation of English idioms for ASL and learning of ASL idioms, along with drugs, religion and sexuality signs, vocabulary, and cultural usage. *Prerequisite:* SPPA 2120.

**5100. Motor Speech Disorders. 4.**

Utilizing audio and audio visual aids, this course acquaints student with dysarthric speech symptoms characteristic of various neurological disorders/diseases. Methods of dysarthric speech evaluation and therapy are considered. *Prerequisite:* SPPA 4380.

**5110. Craniofacial Disorders. 2.**

Studies communication disorders related to cleft lip and palate disorders and associated craniofacial sequences and syndromes. Assessment and treatment of these communication disorders

is presented in the context of interdisciplinary management. Surgical and nonsurgical treatment procedures employed to manage speech problems associated with velopharyngeal insufficiency are included. *Prerequisite:* SPPA 3265, SPPA 3210.

**5115. Interdisciplinary Early Childhood Seminar. 3.**

Advanced professional course for students interested in current trends and issues in early childhood development. Interdisciplinary in nature, drawing from research in communication disorders, kinesiology and health, elementary and early childhood education and special education, child and family studies, nursing, and psychology. Cross listed with FCSC, EDEC, NURS, PSYC, HLED 5115. *Prerequisite:* graduate status.

**5120. Stuttering. 2.**

Theories of etiology, symptoms of the problem, diagnosis and treatment of childhood non-fluency and various approaches to therapy for the adult stutterer. *Prerequisite:* graduate level standing.

**5130. Aphasia. 3.**

Includes neuroanatomical bases of language; characteristics, assessments and intervention with individuals who have aphasia or right hemisphere damage. *Prerequisite:* SPPA 4380.

**5140. Evaluation Procedures in Communication Disorders. 3.**

Focuses on the processes and procedures related to the evaluation of communication disorders. Topics include interviewing, norm-referenced assessment, criterion-based measurement, dynamic assessment, progress monitoring, and psychometric analysis. Overviews models of disability, such as medical, functional, and sociopolitical models, and how they influence the evaluation process. *Prerequisite:* acceptance to the University of Wyoming SLP Master's Program.

**5150. Aural Rehabilitation. 3.**

Examines basis for and characteristics of communication problems created by hearing loss and management procedures to facilitate communication and adjustment to hearing loss. Includes acoustic and visual properties of speech, amplification devices and hearing loss in school children. Dual listed with SPPA 4150. *Prerequisite:* SPPA 4340.

**5200. Internship. 1-12 (Max. 12).**

An advanced practicum in speech pathology; the student is given increased responsibility in clinic management and practicum. Offered summers only. *Prerequisite:* SPPA 5030.

**5210. Developmental Disabilities. 3.**

AAC and other interventions, communication, and cognitive profiles associated with developmental disabilities, such as intellectual disability, autism spectrum disorder, and sensorimotor impairments. Intervention approaches to support communicative development in these

populations. Selection, design, and application of augmentative/alternative communication systems to enhance communication, education, and quality of life for individuals with developmental and acquired disorders. *Prerequisite*: SPPA 4160.

**5220. Voice Disorders. 3.** Study of the etiology, assessment, and remediation of voice disorders. Includes a discussion of preventing disorders, maintaining a healthy voice, and normal changes in voice. Presentation of rehabilitation options for laryngectomized speaker. *Prerequisite*: SPPA 3265.

**5230. Dysphagia. 3.** Provides information regarding the anatomy and physiology of the adult and pediatric swallowing mechanisms, the diagnosis of dysphagia and feeding disorders using clinical and instrumental approaches, the medical diagnoses for which dysphagia is a common symptom, and methods that are commonly used to treat dysphagia and feeding disorders. *Prerequisite*: SPPA 3265.

**5250. Topics in Functional Speech Disorders. 1-8 (Max. 8).** Provides a critical review of contemporary theories and developments related to functional speech disorders. This is a continuing seminar type course dealing with advanced topics in functional speech disorders. *Prerequisite*: graduate standing.

**5260. Topics in Organic Speech Disorders. 1-8 (Max. 8).** Provides a critical review of contemporary theories developments related to organic speech disorders. This is a continuous seminar type course dealing with advanced topics in organic speech disorders. *Prerequisite*: graduate standing.

**5270. Educational Practicum. 1-12 (Max. 12).** Under supervision, the student is given increased responsibility for performing speech and language assessments, hearing screenings, and treatment of children in an educational setting. Students will relate to other educational personnel and counsel teachers and families about communication disorders. *Prerequisites*: completion of at least two semesters (including summer) of approved graduate coursework and clinical practicum (SPPA 5030); and approval of faculty.

**5280. Preschool Language Intervention. 3.** Principles and techniques of language assessment and intervention for preschoolers, infants, and low-functioning individuals. *Prerequisite*: SPPA 4160.

**5290. Medical Practicum. 1-12 (Max. 12).** Under supervision, the student is given increased responsibility for performing speech and language assessments, hearing screenings and treatment of children and adults in a medi-

cal setting. Students relate to other medical and clinical personnel and counsel professionals and families about communication disorders. *Prerequisites*: Completion of at least two semesters (including summer) of approved graduate coursework and clinical practicum; and approval of faculty.

**5330. School-Age Language Intervention. 3.** Principles and techniques of language assessment and intervention for school-age children and adolescents with particular attention to service delivery issues in schools. *Prerequisite*: SPPA 4160.

**5380. Professional Practice. 1-2 (Max. 4).** Discusses issues related to the professional practice of speech-language pathology or audiology, including ethics, professional standards, public law, and universal precautions. *Prerequisite*: graduate standing in Communication Disorders and consent of instructor.

**5500. Topics in Language. 1-8 (Max. 9).** Provides a critical review of recent theories and developments in the area of language disorders. This is a continuing seminar course dealing with various advanced topics in language disorders. *Prerequisite*: graduate standing.

**5750. Research Methods in Speech Pathology and Audiology. 3.** Emphasizes the application of scientific methodologies to areas of Speech-Language Pathology and Audiology. Topics to be covered include: introduction to writing research papers; reviewing and critiquing the literature; experimental designs; techniques in data analyses. *Prerequisite*: STAT 2070 or equivalent; B.S. degree in speech pathology audiology; and acceptance into the graduate program.

**5890. Independent Study. 1-3 (Max. 4).** Graduate-level independent study will be developed by the instructor and student. It will consist of activities such as: conducting a research project of a smaller scale than a thesis, assisting in a research project, composing a systematic research review, or developing a professional education or public awareness program. Satisfactory/unsatisfactory only. *Prerequisite*: graduate standing.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Students are expected to give some lectures and gain classroom experience. *Prerequisite*: graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite*: advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite*: advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite*: enrollment in a graduate degree program.

**5961. Graduate Projects. 1-4. (Max. 4).** Limited to those students enrolled in a Plan B graduate program. Students should be involved in non-course scholarly activities in support of their Plan B project. *Prerequisites*: must be enrolled in Plan B program and have departmental approval.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite*: graduate standing.

## Division of Kinesiology and Health

Corbett Building, 766-5284

FAX: (307) 766-4098

Web site: [www.uwyo.edu/kandh](http://www.uwyo.edu/kandh)

Director: Derek Smith

### Professors:

**TAMI BENHAM DEAL**, B.S. Indiana University 1981; M.S. 1988; P.E.D. 1989; Professor of Kinesiology and Health 2012.

**MARK BYRA**, B.Ed. University of Victoria 1979; M.S. Dalhousie University 1983; Ph.D. University of Pittsburgh 1989; Professor of Kinesiology and Health 2001, 1990.

**JAYNE M. JENKINS**, B.S. Mankato State University 1971; M.S. University of Wyoming 1995; Ph.D. University of North Carolina 1999; Professor of Kinesiology and Health 2011, 1999.

### Associate Professors:

**DEREK SMITH**, B.S. Colorado State University 1997; M.S. Wake Forest University 1999; Ph.D. University of Colorado 2003; Associate Professor of Kinesiology and Health 2009, 2003.

**TRISTAN WALLHEAD**, B.S. Loughborough University 1994; M.S. Leeds Metropolitan University 2000; Ph.D. Ohio State University 2004; Associate Professor of Kinesiology and Health 2010, 2004.

**QIN ZHU**, B.S. Shanghai University of Sports 1999; M.Ed. 2002; Ph.D. Indiana University 2008; Associate Professor of Kinesiology and Health 2014, 2008.

**Assistant Professors:**

**BOYI DAI**, B.Ed. Beijing Sport University 2007; M.S. Iowa State University 2009; Ph.D. University of North Carolina at Chapel Hill 2012; Assistant Professor of Kinesiology and Health 2012.

**KAREN GAUDREAU**, B.S. Northern Illinois University 1998; M.S. University of North Carolina at Greensboro 2000; Ph.D. University of Georgia 2009; Assistant Professor of Kinesiology and Health 2011.

**EMILY GUSEMAN**, B.S. The Pennsylvania State University 2003; M.A. University of North Carolina at Chapel Hill 2005; Ph.D. Michigan State University 2012; Assistant Professor of Kinesiology and Health 2012.

**EVAN C. JOHNSON**, B.A. The George Washington University 2004; M.A. University of Connecticut 2008; Ph.D. 2014; Assistant Professor of Kinesiology and Health 2015.

**CHRISTINE M. PORTER**, B.S. University of Maryland 1993; M.A. University of London 2002; Ph.D. Cornell University 2010; Assistant Professor of Kinesiology and Health 2010.

**R. TUCKER READDY**, B.A. University of California, Berkeley 2000; M.A. San Diego State University 2004; Ph.D. Oregon State University 2009; Assistant Professor of Kinesiology and Health 2010.

**Academic Professionals:**

**GRETCHEN SEWCZAK-CLAUDE**, B.S. Regis University 2003; D.P.T. 2007; Assistant Lecturer in Kinesiology and Health 2014.

**MARC SMITH**, B.S. Colorado State University 1995; M.S. Wake Forest University 1998; Associate Lecturer in Kinesiology and Health 2012, 2003.

**Adjunct Faculty:**

Laurence Deal, Shane Tweeter, Joi Thomas, Enette Larson Meyer, Jordan Kobritz, Ryan Pinson, Jennifer Knerr, Jill Dalgarno

**Professors Emeriti:**

Paul Dunham  
Ward Gates  
Charles W. Huff  
Donna Marburger  
D. Paul Thomas

The Division of Kinesiology and Health has three principle functions specific to undergraduate education: (1) to prepare students in kinesiology and health promotion for a variety of clinical and non-clinical settings; (2) to prepare students to teach physical and health education in schools K-12; and (3) to continue to deliver the 2003 USP Physical Activity and Your Health program university wide to meet the University Studies Physical Activity and

Health requirement. Students enrolled in these programs must meet academic standards as determined by the Division of Kinesiology and Health, College of Health Sciences, and the University of Wyoming.

The K&HP major prepares students well for admission to physical therapy school and occupational therapy school, as well as other health professions (e.g., physician, physician assistant, dentist, chiropractor, optometrist, etc.). Approximately 60% of students majoring in K&HP apply to one of these health professional schools once they have completed their B.S. degree in Kinesiology and Health. Other students majoring in training, fitness, recreation, and leisure, and health promotion with state agencies - the job market is very diverse for these students.

The PHET program prepares students to teach physical and health education (PHET) in schools K-12. The PHET major is a nationally recognized program for meeting the NASPE/NCATE Initial Physical Education Teacher Education Accreditation Standards. This program offers individuals opportunity to combine certifications/endorsements in health education K-12, adapted physical education K-12, and coaching.

A graduate program leading to a Master of Science degree in Kinesiology and Health is offered by the Division.

**Program Admission**

Students who meet University of Wyoming entry requirements are admitted to the university in one of the two undergraduate majors that leads to the Bachelor of Science degree. The Division's undergraduate majors are open at the freshman level to all graduates of accredited high schools. Advanced placement for students with previous college credit is based on evaluation of transcripts of previous academic work. When students are ready to begin their junior year in the two undergraduate programs offered, they must make application for admission. The entry course for admission to the junior year of the Kinesiology and Health Promotion (K&HP) program is KIN 3021, Physiology of Exercise. The entry course for admission to the Physical Education Teacher Education (PHET) program is KIN 3012, Teaching Lab I. To be eligible, students must have completed all program course prerequisites and have a minimum cumulative grade point average of 3.00. Admission to the two majors is a competitive process and applicants meeting minimum requirements are not guaranteed admission

to the major. Application to the K&HP major must be received by the Division of Kinesiology and Health no later than April 15 for fall admission and no later than November 20 for spring admission. Application to the PHET majors is conducted only for fall. The application deadline is April 15.

**Undergraduate Majors**

The requirements to graduate with a Bachelor of Science degree in the majors offered by the Division of Kinesiology and Health are as follows:

**I. Kinesiology and Health Promotion Major****A. FRESHMAN-SOPHOMORE YEARS**

CHEM	1020 (PN)	.....	4
ENGL	1010 (COM1)	.....	3
FCSC	1140 or 1141	.....	3
HLED	1006	.....	3
KIN	1005	.....	1
KIN/ZOO	2040	.....	3
KIN/ZOO	2041	.....	1
ZOO	3115	.....	4
LIFE	1010 (PN)	.....	4
MATH	1400, 1405, or 1450 (Q)	.....	3
PHYS	1050 or 1110	.....	4
PSYC	1000 (H)	.....	3
STAT	2050 or 2070 (Q)	.....	4
USP U.S. & Wyoming Constitutions (V)	.....		3
USP First-Year Seminar (FYS)	.....		3
USP Communication II (COM2)	.....		3
USP Human Culture (H)	.....		3

In the spring semester of their sophomore year, students must make application for admission to the final two years of the Kinesiology and Health Promotion (K&HP) program (professional program). This includes a \$30.00 application fee, completion of coursework specific to the first two years of the program, a minimum grade point average of 3.00, and completion of a written essay. Admission to the K&HP program is a competitive process and applicants meeting the minimum requirements are not guaranteed admission to the major.

**B. JUNIOR-SENIOR YEARS**

(*professional*)

**i. Required Courses (22 hours)**

HLED	3020	.....	3
KIN	3010	.....	3
KIN	3021	.....	4
KIN	3034 or 4020	.....	3
KIN	3037 or 3038	.....	3
KIN	3042	.....	3
USP Communication III (COM3)	.....		3

**ii. HLED and KIN Electives (15 hours)**

Students must complete a minimum of 15 credit hours of upper division HLED and/or KIN courses specific to one of three concentrations: (a) Fitness and Wellness; (b) Health Promotion; or (c) Medical and Therapeutic Sciences (pre-professional).

**iii. Specialization Areas (19 hours) - 3000 or 4000 level courses**

Students must complete a minimum of 19 credit hours of upper division coursework that complements their selected area of concentration (i.e., Fitness and Wellness; Health Promotion; or Medical and Therapeutic Sciences [pre-professional]).

**iv. Internship or Research Experience (6-12 hours)**

Students must complete at least six hours of Internship Experience or Research Experience that complements their selected area of concentration (i.e., Fitness and Wellness; Health Promotion; or Medical and Therapeutic Sciences [pre-professional]). Students must be certified in first aid and CPR prior to enrollment in KIN/HLED 4015.

**Minimum Total Hours 120**

**II. Physical Education Teacher Education K-12**

**A. FRESHMAN-SOPHOMORE YEARS**

CHEM 1020 (PN) .....	4
ENGL 1010 (COM1) .....	3
ENGL 2020 (COM2) .....	3
FCSC 1140 or 1141 .....	3
HLED 1006 .....	3
LIFE 1010 (PN) .....	4
MATH 1400, 1405, or 1450 (Q) .....	3
KIN 2000 .....	2
KIN 2001 .....	2
KIN 2003 .....	2
KIN 2004 .....	3
KIN 2005 .....	2
KIN/ZOO 2040 .....	3
KIN/ZOO 2041 .....	1
ZOO 3115 .....	4
PHYS 1050 or 1110 .....	4
USP U.S. & Wyoming Constitutions (V) .....	3
PSYC 1000 (H) .....	3
STAT 2050 or 2070 (Q) .....	4
USP First-Year Seminar (FYS) .....	3
USP Human Culture (H) .....	3

In the spring semester of their sophomore year, students must make application for admission to the final two years of the Physical Education Teacher Education (PHET) program (professional program). This includes a \$30.00 application fee, completion of coursework specific to the first two years of the program, a minimum grade point average of 3.00, completion of 60 contact hours with youth in a movement setting, completion of a written essay, and an interview. Admission to the PHET program is a competitive process and applicants meeting the minimum requirements are not guaranteed admission to the major.

**B. JUNIOR-SENIOR YEARS (professional)**

**i. Required Courses (53 hours)**

EDSE 3540 .....	2
KIN 3011 .....	3
KIN 3012 (COM2) .....	3
KIN 3015 .....	3
KIN 3021 .....	4
KIN 3034 .....	3
KIN 3037 or 3038 .....	3
KIN 3042 .....	3
KIN 3050 .....	2
KIN 3060 .....	3
KIN 4012 .....	3
KIN 4013 .....	2
KIN 4017 .....	3
KIN 4055 .....	2
KIN 4080 (COM3) .....	3
KIN 4099* .....	12

**Minimum Total Hours 120**

\*Note: students must be certified in first aid and CPR prior to enrollment in KIN 4099.

**III. Additional School Endorsements K-12**

In addition to completing the Bachelor of Science degree in physical education teacher education from the University of Wyoming, students can qualify for K-12 endorsements in adapted physical education and/or health education by completing the following course requirements:

**A. Adapted Physical Education K-12**

KIN 4065 .....	3
KIN 4075 .....	3
EDEX 2484 .....	3

**B. School Health Education K-12**

HLED 4025 .....	3
HLED 4110 .....	3
HLED 4120 .....	3
HLED 4130 .....	3
PSYC 2210 .....	3

**IV. Affiliated Options**

The Division of Kinesiology and Health offers two options for the general undergraduate population. They require course work beyond degree requirements.

**A. Athletic Coaching Endorsement**

Students who wish to qualify for an athletic coaching permit to coach in Wyoming public schools must complete four courses.

**CPR/First Aid Certification**

KIN 3050 .....	2
KIN 4090 .....	3
Coaching in... Experience	

**B. School Health Education K-12**

In addition to completing a bachelor's degree in teaching at the secondary level from an approved university program, 25 credit hours are required to be endorsed to teach health education K-12 in the public schools of Wyoming.

FCSC 1140 or 1141 .....	2-3
HLED 1006 .....	3
CPR/First Aid Certification	
HLED 4120 .....	3
HLED 4025 or SOC 2200 .....	3
HLED 4110 .....	3
HLED 4130 .....	3
PSYC 2210 .....	3

**Graduate Study**

**Program Specific Admission Requirements**

Admission into the M.S. degree program is open to students who have obtained an undergraduate with a major program of study in exercise and sport science, health, kinesiology, physical education, or other area in the human movement sciences.

Students who do not have a bachelor's degree in kinesiology, physical education, or health are required to complete four undergraduate courses in kinesiology and/or health (e.g., HLED 3020 Community and Public Health; KIN 3034 Lifespan Motor Development; KIN 2040 Human Anatomy; KIN 3115 Human Systems Physiology; KIN 3037 Sport Psychology; etc.) above and beyond the master's program of studies.

### Program Specific Graduate Assistantships

Graduate assistantships are available on a competitive basis. Teaching opportunities exist within the laboratory portions of the human anatomy and exercise physiology courses, the teaching laboratory portions of the pedagogy practical courses, HLED 1006, Personal Health. A graduate assistantship also involves some research opportunities with assigned graduate faculty advisors.

A stipend for a full time graduate assistant is \$11,700.00 per academic year. Tuition and fees are covered according to the percentage of assistantship allocated to the student.

### Program Specific Degree Requirements Master's Programs

#### Plan A (thesis)

Minimum of 30 credit hours

Minimum of 18 credit hours of HLED and/or KIN coursework

HLED/KIN 5085

Must choose at least one from this list: STAT 5050, 5060, 5070, or 5080; or EDRE 5600 or 5640

4 credit hours of HLED/KIN 5960 (Thesis Research)

Minimum of 9 credit hours of HLED/KIN coursework in area of specialization

Oral presentations of thesis proposal and defense

#### Plan B (non-thesis)

Minimum of 36 credit hours

Minimum of 18 credit hours of HLED and/or KIN coursework

HLED/KIN 5085

Must choose at least one from this list: STAT 5050, 5060, 5070, or 5080; or EDRE 5600 or 5640

3 credit hours of HLED/KIN 5080

Minimum of 3 credit hours of coursework selected from outside the Division of Kinesiology and Health

Plan B paper (written and oral)

### M.S. in Kinesiology and Health Distance Education

The Division of Kinesiology and Health offers the M.S. degree in kinesiology and health (non-thesis) as a distance education program through the University of Wyoming Outreach School. The area of emphasis for the distance program is physical education teacher education. The program is structured such that students can pursue the M.S. degree on a part time basis off-campus. For more information visit our Web site at [www.uwyo.edu/kandh](http://www.uwyo.edu/kandh).

## Physical Education Activity (PEAC)

Program activity-theory courses for men and women. All activity classes are offered for S/U grade only, with the exception of 2000. Physical education activity courses may not be offered every semester.

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB↔Q]).**

#### 1000. P.E. Activity in \_\_\_\_\_. 1/2 (Max. 1).

Provides instruction in special and/or unique sport, dance or exercise on a temporary basis.

#### 1001. Physical Activity and Your Health. 1.

**[P↔(none)]** Designed to help students gain an understanding of the impact physical activity or inactivity has on their health. Students gain the knowledge, skills, and experience that enable them to make informed decisions about their own health as it relates to their quality of life and longevity. **NOTE:** All students must enroll in a PEAC 1001 activity as part of the PEAC 1001 experience.

**1012. Beginning Swimming. 1/2.** Instructs the non-swimmer in skills suggested by the Red Cross.

#### 2000. Wellness: Physical, Nutrition, and Lifestyle Concepts. 1-3 (Max. 9).

Designed to present information on topics including (but not limited to): nutrition, mobility and injury prevention, sleep and stress management, sport psychology, ethics in sport and human performance, and methods of fitness. Also includes a physical activity component. Offered as S/U.

## Varsity Athletics (PEAT) (Men and Women)

The following activities are for enrollment only by members of intercollegiate athletic teams. Participation in these activities will not satisfy the PEAC requirements.

**2010. Varsity Swimming. 1/2.**

**2051. Varsity Golf. 1/2**

**2054. Varsity Track and Field. 1/2.**

**2056. Varsity Tennis. 1/2.**

**2062. Varsity Basketball. 1/2.**

**2063. Varsity Football. 1/2.**

**2064. Varsity Volleyball. 1/2.**

**2065. Varsity Pepsters. 1/2.**

**2070. Varsity Rodeo. 1/2.**

**2071. Varsity Soccer. 1/2.**

## Kinesiology (KIN)

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB↔Q]).**

#### 1004 [PEPR 1004]. Foundations of Physical Education. 3. [I,L↔(none)]

An introductory course designed to acquaint first year or second year students to the academic discipline of physical education with an emphasis on the teaching career. Cross listed with HLED 1004.

#### 1005 [PEPR 1005]. Kinesiology, Health, and Teaching Physical Activity. 3.

**[I,L↔(none)]** A survey of the disciplines of kinesiology, health, and teaching physical activity. Students master knowledge specific to kinesiology, health, and teaching physical activity while developing critical thinking skills and basic competence in communication skills and information literacy.

#### 1040. Contemporary Topics in North American Sport. 3. [CH,D↔(none)]

An introductory course that focuses on sport as an institution in North American society. A range of topics is explored from diverse perspectives (historical, sociological, psychological, political, and gender theories), so learners can critically examine what it means to be a part of "sport" in contemporary North American society.

#### 1052 [PEPR 1052]. Introduction to Athletic Training. 3.

Provides the prospective athletic trainer with the skill and knowledge necessary to improve a risk management and preventative program for athletes and others involved in physical activity.

#### 1058 [PEPR 1058]. Emergency Management of Athletic Injury/Illness. 3.

Provides the prospective athletic trainer with the skill and knowledge necessary to provide for emergency care, triage, and management of emergencies and life-threatening situations for the physically active.

#### 1101. First-Year Seminar. 3. [(none)↔FYS]

#### 2000 [PEPR 2000]. Movement Core I: Striking/Fielding and Invasion Games. 2.

Exposes students to skill and tactical themes comprising striking/fielding and invasion games. Course aims for students' ability to understand, demonstrate and analyze the different offensive and defensive tactics that facilitate game play success in invasion (soccer, tag rugby, basketball) and striking/fielding (softball, cricket) games. *Prerequisites:* sophomore standing, declared PHET major, completion or concurrent enrollment in MATH 1400.

#### 2001 [KIN 1025, PEPR 1025]. Movement Core II: Net and Target Games. 2.

Exposes students to skill and tactical themes comprising net and target games. Course aims for

students' ability to understand, demonstrate and analyze different offensive and defensive tactics facilitating game play success in net (volleyball, tennis, badminton) and target (archery) games. *Prerequisites:* sophomore standing, declared PHET major, completion or concurrent enrollment in MATH 1400.

**2002 Movement Core III: Fundamental Motor Skills. 2.** Designed to provide pre-service physical education teachers with the content and teaching strategies associated with teaching motor skills to school aged children grades K-5. Students learn both skill themes and movement concepts. Students have the opportunity to apply skills and knowledge in a practical experience with young children in a school based PE setting. *Prerequisites:* sophomore standing, declared PHET major, completion or concurrent enrollment in MATH 1400.

**2003 [KIN 1000, PEPR 1000]. Movement Core IV: Educational Games and Gymnastics. 2.** To provide pre-service teachers (PTs) with the skills and knowledge necessary to teach educational games and gymnastics to public school students. *Prerequisites:* sophomore standing, declared PHET major, completion or concurrent enrollment in MATH 1400.

**2004 [KIN 3025, PEPR 3025]. Movement Core V: Fundamental Motor Skills, Creative Movement, and Dance. 3. [CA♦(none)]** Designed for prospective physical education teachers K-12. Fundamental motor skills, dance, and creative movement and the associated teaching behaviors needed to teach this content to K-12 learners is the focus of this course. *Prerequisite:* Sophomore standing, declared PHET major, completion or concurrent enrollment in MATH 1400.

**2005 [KIN 2025, PEPR 2025]. Movement Core VI: Physical Fitness and Physical Activity 2.** Designed for prospective school-based physical and health education teachers K-12. Focuses on five primary content areas: what is fitness education and why do we need it; development of content-based fitness curriculum; teaching cognitive aspects of fitness education; teaching physical aspects of fitness education; and promoting fitness education. *Prerequisites:* sophomore standing, declared PHET major, completion or concurrent enrollment in MATH 1400.

**2010 [PEPR 2010]. Field Experience for Prospective Elementary and Secondary Teachers. 1-4 (Max. 4).** Provides initial experience in the public school setting. Full-time assignment of one to four weeks in a public school under supervision of a certified teacher. Students serve as teacher aides.

**2012 [PEPR 2012]. Physical Education for Elementary Schools. 2.** Emphasizes impact that a sound elementary physical education program can have on growth and development of healthy children. Students identify the need for a balanced physical education program. Focuses on curriculum, teaching styles, class management and instruction. *Prerequisite:* EDFD 2040 or consent of instructor.

**2015 [PEPR 2015]. Methods of Teaching Social Dance Forms. 1.** Develops a large repertoire in folk, square, round and social dance. Students acquire knowledge and confidence in methods of teaching these forms. *Prerequisite:* KIN 1031.

**2017 [PEPR 2017]. Water Safety Instructors' Course. 1.** Examines procedures and standards as required by the American Red Cross in analysis, performances and teaching techniques. Includes five styles of swimming and senior lifesaving. *Prerequisites:* 18 years of age and a current Senior Life Saving Certificate.

**2040 [PEPR 2040]. Human Anatomy. 3. [SB♦(none)]** Study of human structure in terms of its microscopic and gross anatomy. Provides students with adequate background to study human physiological function. The corresponding course, to be taken concurrently, is ZOO/KIN 2041. Cross listed with ZOO 2040. *Prerequisite:* LIFE 1000 or 1010.

**2041 [PEPR 2041]. Human Anatomy Laboratory. 1. [SB♦(none)]** A laboratory study of human structure in terms of human microscopic and gross anatomy. This laboratory course is designed to provide students with an adequate background to study human physiology and kinesiological function. *Prerequisite:* KIN/ZOO 2040 or concurrent enrollment in KIN/ZOO 2040.

**2057 [PEPR 2057]. Assessment and Evaluation of Athletic Injury/Illness I. 3.** Provides the prospective athletic trainer with the skill and knowledge necessary to evaluate and recognize upper extremity, cervical spine, and head injuries that occur to the athlete and physically active. *Prerequisites:* KIN 1052, 1058, 2040, and 2041; concurrent enrollment in KIN 2068.

**2058 [PEPR 2058]. Assessment and Evaluation of Athletic Injury/Illness II. 3.** Provides the prospective athletic trainer with the skill and knowledge necessary to evaluate and recognize lower extremity and spine injuries that occur to the athlete and physically active. *Prerequisites:* KIN 2057; concurrent enrollment in KIN 2078.

**2068. Athletic Training Clinical I. 1.** Provides clinical and field experience for the athletic training student. Skill and knowledge

learned in KIN 1052 and 1058 are applied in the clinical and field settings. *Prerequisites:* KIN 1052, 1058, 2040, and 2041; concurrent enrollment in KIN 2057.

**2069 [PEPR 2069]. History and Philosophy of Sport. 3.** Discusses history of sport with emphasis on contributions of Greeks and Romans. Studies influence of Scandinavian countries, Germany and other European nations, plus sports and games of the American Indians. Includes sports in the U.S. from colonial period through present and influence of selected educational philosophers on sports. (Offered fall semester)

**2078. Athletic Training Clinical II. 1.** Provides clinical and field experience for the athletic training student. Skill and knowledge learned in KIN 1052, 1058, and 2057 are applied in the clinical and field settings. *Prerequisites:* KIN 2057 and 2068; concurrent enrollment in KIN 2058.

**2080 [3090, PEPR 3090]. Coaching Football. 2.** For those who wish to become proficient in skills and techniques of teaching fundamentals and team organization of modern football. Presents use of audiovisual materials for teaching and scouting purposes. *Prerequisites:* successful completion of USP core requirement I. (Offered spring semester)

**2081 [3091, PEPR 3091]. Coaching Basketball. 2.** For all men and women wishing to coach basketball. Presents organization of practice schedule, meeting the public, varsity travel and fundamentals of offense and defense. *Prerequisites:* successful completion of USP core requirement I. (Offered fall semester)

**2082 [3092, PEPR 3092] Coaching Track and Field. 2.** For those interested in teaching or coaching track and field. *Prerequisites:* successful completion of USP core requirement I. (Offered fall semester)

**2083 [3093, PEPR 3093]. Coaching Swimming. 2.** Acquaints students with many different aspects of aquatics; provides understanding of rhythmical parts of selected swimming strokes; explains water safety; discusses teaching and coaching aspect of a total swimming program. *Prerequisites:* successful completion of USP core requirement I. (Offered fall semester)

**2084 [3094, PEPR 3094]. Coaching Wrestling. 2.** Acquaints and prepares students with theory and techniques involved in teaching and coaching wrestling. *Prerequisites:* successful completion of USP core requirement I. (Offered spring semester)

**2085 [3095, PEPR 3095]. Coaching Volleyball. 2.** Encompasses techniques of coaching volleyball with emphasis on skill analysis, strat-



egy, team dynamics and training. *Prerequisites:* successful completion of USP core requirement I. (Offered fall semester)

**2086 [3096, PEPR 3096]. Coaching Gymnastics. 2.** Helps students organize and administer competitive gymnastics program and introduces coaching and training philosophies used in gymnastics. *Prerequisites:* successful completion of USP core requirement I. (Offered fall semester)

**2087 [3097, PEPR 3097]. Coaching Baseball. 2.** Encompasses theories and techniques of coaching baseball. Emphasizes team and individual position play. *Prerequisites:* successful completion of USP core requirement I. (Offered fall semester)

**2088 [3098, PEPR 3098]. Coaching Tennis. 2.** Examines techniques of coaching tennis. Emphasizes skill analysis, strategy and training. *Prerequisites:* successful completion of USP core requirement I. (Offered spring semester)

**2089 [3099, PEPR 3099]. Coaching Soccer. 2.** Explores techniques of coaching soccer. Emphasizes skill analysis, strategy, team dynamics and training. *Prerequisites:* successful completion of USP core requirement I.

**2091 [PEPR 2091]. Rules and Techniques of Athletic Officiating I. 2.** Surveys techniques and rules of athletic officiating. Emphasizes principles and procedures necessary to become an effective official. Laboratory experience in officiating is provided that covers the officiating aspects of football, cross country, basketball and wrestling.

**2092 [PEPR 2092]. Rules and Techniques of Athletic Officiating II. 2.** Surveys techniques and rules of athletic officiating. Emphasizes principles and procedures necessary to become an effective official. Provides laboratory experience in officiating, covering officiating aspects of swimming, volleyball, track and field and baseball.

**2900. Topics In: \_\_. 1-3 (Max. 3).** Course Topics could include Peer Health Education, Current Issues in Health, etc. *Prerequisite:* sophomore standing.

**3010 [PEPR 3010]. Fundamentals of Health and Fitness Assessment. 3.** Students will learn the fundamental concepts of health appraisal, assessment of health-related fitness and physical fitness levels, individual and group exercise programming and leadership, and methods of behavioral change. Fitness will be discussed in both theoretical and practical terms with an emphasis on adults. Has lecture and lab components. *Prerequisites:* completed or concurrent enrollment in KIN 3021; 2.5 GPA.

**3011 [PEPR 3011]. Teaching Methods in Physical Education K-12. 3.** Develops knowledge, skills and understandings ap-

propriate to successful participation in a class setting when functioning in the teaching role. *Prerequisites:* grade of C or better in KIN 3012 and 3034; 2.75 minimum GPA; concurrent enrollment in KIN 3015.

**3012 [PEPR 3012]. Teaching Laboratory I. 3. [(none)◀COM2]** Provides the opportunity to develop skills and acquire knowledge needed to teach physical education. Allows the opportunity for students to evaluate the motor status and progress of a preschool aged child, as well as plan and implement a developmentally appropriate motor program. *Prerequisites:* Completed KIN 1000, 1004, 1025, 2000, 2025, 3025, and THEA 3025; concurrent enrollment in KIN 3034; 2.5 GPA. (Offered fall semester)

**3015 [PEPR 3015]. Teaching Laboratory II. 3. [WC▶(none)]** Provides pre-service physical education teacher with skills, knowledge and principles of teaching through application of peer teaching and small group elementary school teaching. Emphasizes and practices program development, lesson planning and development of a physical education teaching unit. *Prerequisites:* grade of C or better in KIN 3012 and 3034; 2.75 minimum cumulative GPA; concurrent enrollment in KIN 3011, 4055 and 4080. (Offered spring semester)

**3020 [PEPR 3020]. Observational Experience in Movement Science. 1-2 (Max. 6).** Provides students with off-campus opportunity to observe professionals in the work place. Emphasis is placed on physical or occupational therapy. Conducted under supervision and arranged by coordinator of undergraduate programs. Offered S/U only. *Prerequisites:* sophomore status, consent of coordinator of undergraduate programs, 2.5 GPA.

**3021 [PEPR 3021]. Physiology of Exercise. 4.** Applies physiological principles to human physical activities. Emphasizes interaction of neuromuscular, circulatory and respiratory mechanisms as affecting, and affected by, immediate exercise situation and physical training. Includes laboratory. Cross listed with ZOO 3021. *Prerequisites:* QA, KIN/ZOO 2040 and 3115; minimum 2.5 GPA. (Offered fall and spring semesters)

**3034 [PEPR 3034]. Lifespan Motor Development. 3.** Studies lifespan motor development. Emphasizes developmental periods of infancy through adolescence. Gives attention to observation and analysis of motor behavior and movement performance of individuals across lifespan. *Prerequisites:* PSYC 1000; junior status; 2.50 GPA. (Offered fall semester)

**3037 [PEPR 3037]. Sport Psychology. 3.** Studies psychological theories and techniques applied to sport to enhance the performance and personal growth of athletes and coaches.

Emphasizes the influence of personality, anxiety, motivation, social factors, and psychological skills training. *Prerequisite:* Admitted to the last two years of one of the programs in DK&H. *Prerequisites:* PSYC 1000, junior status and 2.50 GPA.

**3038. Exercise Psychology. 3.** Studies psychological theories for understanding and predicting health-oriented exercise behavior, including psychological intentions for increasing exercise participation and adherence. Emphasizes psychological and psychobiological responses to exercise. *Prerequisites:* admitted to the last two years of one of the programs in DK&H.

**3040 [PEPR 3040]. Teaching Human Anatomy. 3.** Students develop communication and teaching skills while expanding their knowledge in anatomy. Under faculty instruction, each student develops lecture and laboratory lessons for all human anatomy systems. Under direct faculty supervision, each student demonstrates their teaching skills through preparation of videotape segments and actual laboratory teaching experience in the lower-division human anatomy course. *Prerequisites:* KIN/ZOO 2040, junior status and consent of instructor.

**3042 [PEPR 3042]. Biomechanics of Human Movement. 3.** Introduces fundamental principles of human movement. Includes study and elementary analysis of human motion based on anatomical and mechanical principles. *Prerequisites:* KIN/ZOO 2040; PHYS 1050 or 1110 or 1210 or 1310; minimum 2.5 GPA.

**3050 [PEPR 3050]. Prevention and Care of Athletic Injuries. 2.** Encompasses theory and practical work in the field of athletic training. Strongly emphasizes prevention and care of athletic injuries, including wrapping and taping techniques. *Prerequisites:* junior status; LIFE 1000 or 1010; minimum 2.5 GPA.

**3052 [PEPR 3052]. Rehabilitation of Athletic Injuries. 3.** Provides a foundation of appropriate rehabilitation principles and techniques based on current research/rationale. The scope is inclusive of approaches applicable to common sports medicine problems. *Prerequisites:* KIN 2058 and 2078; minimum GPA of 2.50.

**3058 [PEPR 3058]. Therapeutic Modalities for the Athletic Trainer. 3.** Provides the prospective athletic trainer with the knowledge and skill necessary to use therapeutic modalities for the health care of the physically active. *Prerequisites:* KIN 3052 and 3068; minimum GPA of 2.50.

**3060. Understanding Skill Acquisition for Teaching. 3.** Addresses practical questions specific to teaching physical activity - who are

my students, what skills am I teaching, how do I teach skills effectively? Examine such concepts as individual differences, nature of motor skills, content and structure of skill practice, and the art of giving feedback. *Prerequisites:* PSYC 1000 or equivalent; admission to professional program in PHET.

**3068. Athletic Training Clinical III. 2.** Provides clinical and field experience for the athletic training student. Skill and knowledge learned in KIN 2057 and 2058 are applied in the clinical and field settings. *Prerequisites:* KIN 2058 and 2078; concurrent enrollment in KIN 3052; minimum GPA of 2.50.

**3078. Athletic Training Clinical IV. 2.** Provides clinical and field experience for the athletic training student. Skill and knowledge learned in KIN 2057, 2058, and 3052 are applied in the clinical and field settings. *Prerequisites:* KIN 3052 and 3068; concurrent enrollment in KIN 3058; minimum GPA of 2.50.

**3115. [KIN 2110, PEPR 2110]. Human Systems Physiology. 4.** Covers the fundamental function(s) of the human body systems, from cells and tissues through organs and systems, focusing also on biological communication and homeostasis. Students learn how to interpret physiological data. Includes laboratory and tutorial sessions. Fulfills degree requirement in physiology subsection for zoology major. Cross listed with ZOO 3115. *Prerequisites:* At least ((C in CHEM 1020 or CHEM 1050) or B in CHEM 1000) and C in LIFE 1010.

**4001 [PEPR 4001]. Short Course in Physical Education for Undergraduates. 1-6 (Max. 6).** Highlights special topics in kinesiology at the undergraduate level, based on need. Maximum allowable credit is 6 semester hours. Offered S/U only. *Prerequisites:* junior status and 2.50 cumulative GPA.

**4012 [PEPR 4012]. Curriculum Development in Physical Education. 3.** Focuses on the design of K-12 school physical education programs. It provides opportunities to study alternative curriculum models, engage in the process of curriculum design, and examine policy and theoretical issues of concern to curriculum designers. *Prerequisites:* grade of C or better in KIN 3011, 3015 and 4080; 2.75 minimum cumulative GPA; concurrent enrollment in KIN 4017. (Offered fall semester)

**4013. School Administration for the Health Sciences. 2.** Provides teaching majors with information about staff-administrator relationships in school settings. Topics include principles of leadership, school organization and culture, legal issues, financial issues, building and facilities management. *Prerequisites:* senior

status, acceptance into the Physical Education Teacher Education program, and minimum GPA of 2.75.

**4015 [PEPR 4015]. Internship Experience in Kinesiology. 1-12 (Max. 12).** Provides culminating clinical experience at a business, industry or institution related to students' aspirations and training. Conducted under Kinesiology departmental faculty member. Offered S/U only. Cross listed with HLED 4015. *Prerequisites:* junior standing, KIN 3021; 2.50 GPA.

**4016. Research Experience in Kinesiology and Health. 1-6 (Max. 6).** Offered to students who wish to gain a research experience in Kinesiology and Health. Meant for students who are interested in pursuing an advanced degree. Students may choose to complete KIN/HLED 4016 instead of KIN/HLED 4015. Cross listed with HLED 4016. *Prerequisites:* minimum junior standing; completed KIN 3021; minimum 2.50 GPA.

**4017 [PEPR 4017]. Teaching Laboratory III. 3.** Focuses on the application of teaching skills and the effective utilization of sport-based curricular and instructional models in the secondary public school setting. *Prerequisites:* grade of C or better in KIN 3011, 3015, and 4080; 2.75 minimum cumulative GPA; concurrent enrollment in KIN 4012. (Offered fall semester)

**4020. Motor Behavior. 3.** Provides undergraduate majors in kinesiology and health the foundation of motor learning and control theories to be applied to decisions related to the enhancement of human performance. *Prerequisites:* PSYC 1000 or equivalent course; admission to professional program in K&HP.

**4024. Physical Activity Epidemiology. 3.** This course will examine physical activity from a public health perspective. Topics include study design, critical appraisal of research, assessment of physical activity, relationships between physical activity and health outcomes, and current issues in physical activity epidemiology. Dual listed with KIN 5024. *Prerequisite:* KIN 3021.

**4029 [PEPR 4029]. Methods of Training and Conditioning. 3.** Gives students knowledge and experience needed to develop and lead exercise training programs. Of interest to teachers, coaches and fitness leaders. *Prerequisites:* junior standing, KIN 3021 and minimum 2.50 GPA. (Offered spring semester)

**4042. Advanced Biomechanics. 3.** Provides understanding of biomechanical theories and the application of biomechanical measurements to human movement in sports, training, and rehabilitation. Emphasis on using equipment to collect biomechanical data to answer

research and clinical questions. Lecture and data collection topics include electromyography, force, balance, kinematics, and kinetics. *Prerequisites:* KIN 3042.

**4052 [PEPR 4052]. General Medical Conditions for the Athletic Trainer. 3.** Provides the prospective athletic trainer with the knowledge and skill necessary to recognize, manage, and refer the general medical conditions, disabilities and pathologies that occur to athletes and the physically active. *Prerequisites:* KIN 3058 and 3078; concurrent enrollment in KIN 4068; minimum GPA of 2.50. (Offered fall semester)

**4055 [PEPR 4055]. Adapted Physical Education. 2.** Presents skills necessary to plan, implement and evaluate individualized physical education programs in the least restrictive environment. Acquaints students with current laws, characteristics, assessment instruments and nationally validated programs in physical education for the disabled child. *Prerequisites:* KIN 3034 and 2.50 GPA. (Offered spring semester)

**4056 [PEPR 4056]. Advanced Exercise Testing and Prescription. 4.** Teaches foundational electrocardiography to perform graded exercise stress tests (GXT), performance of GXT's to health and diseased populations based on a health appraisal assessment. Knowledge used to develop comprehensive exercise prescriptions, make metabolic calculations. Emphasis on how physical activity, nutrition/weight management, and behavioral factors interact with exercise programming. Dual listed with KIN 5056. *Prerequisites:* completion of KIN 3010 and 3021; 2.5 GPA; CPR Certification.

**4058 [PEPR 4058]. Organization, Administration, and Pharmacology for the Athletic Trainer. 3.** Provides the prospective athletic trainer with the knowledge and skill necessary to better understand the pharmacology and administration of athletic health management. *Prerequisites:* KIN 3052 and 3068; concurrent enrollment in KIN 3058 and KIN 3078; minimum GPA of 2.50. (Offered spring semester)

**4062. Applied Concepts in Human Aging. 3.** Designed to integrate and apply concepts acquired in core KIN and HLED courses (e.g. human physiology, exercise physiology, health promotion, etc.) to the growing of older/aging adults. Age-related pathologies will be presented and discussed as will be the scientific method. *Prerequisites:* KIN 3021; minimum 2.5 GPA; junior standing.

**4065 [PEPR 4065]. Resources in Adapted Physical Education. 2-3 (Max. 3).** Offers flexible credit for students interested in pursuing intensive study of resources for adapted physical education. Required for state

endorsement in Adapted Physical Education. *Prerequisites:* junior status, KIN 4055 and minimum 2.50 GPA.

**4066. Biological Factors Influencing Exercise Performance. 3.** Application of physiological responses to exercise to special conditions. A focus on skeletal muscle fiber typing and the importance of fiber type distribution in athletics. Factors like nutritional needs of athletes, use of ergogenic aids, the female and child athlete, exercise in "hostile" environments, and long term competitive events covered. *Prerequisite:* KIN 3021; 2.50 GPA.

**4068. Athletic Training Clinical V. 3.** Provides clinical and field experience for the athletic training student. Skill and knowledge learned in KIN 3052 and 3058 are applied in the clinical and field settings. *Prerequisites:* KIN 3058 and 3078; concurrent enrollment in KIN 4052; minimum GPA of 2.50.

**4074 [PEPR 4074]. Field Studies in \_\_\_\_\_. 1-5 (Max. 12).** Offered only through extension services. Broad and flexible and can be utilized in numerous situations to meet local needs. (Credit in this course is not applicable toward advanced degrees.) Cross listed with HLED 4074. Offered for S/U grade only.

**4075. Assessment in Adapted Physical Education. 3.** Designed to provide an overview of the assessment process in adapted physical education. Developmentally and disability appropriate psychomotor assessments and procedures for administering them are examined. *Prerequisites:* KIN 4055, KIN 4080.

**4080 [PEPR 4080]. Assessment in Physical Education. 3. [WC♦(none)]** Provides prospective teachers with a thorough knowledge of learner assessment as applied to physical education K-12. *Prerequisites:* grade of C or better in KIN 3012 and 3034; 2.75 minimum cumulative GPA. (Offered spring semester)

**4085 [PEPR 4085]. Honor Studies in Physical Education. 2-10 (Max. 10).** Provides flexible credit for undergraduate honor students to study under distinguished faculty in a specialized academic area of interest at UW or any other approved college or university. *Prerequisites:* 3.00 cumulative GPA and admission to physical education honors program.

**4086 [PEPR 4086]. Honors Seminar. 2.** Independent study. Consists of in-depth application of experimental techniques and materials to appropriate academic areas which directly support students' majors. Offered for S/U grade only. *Prerequisites:* 3.00 cumulative GPA and admission to physical education honors program.

**4088. Athletic Training Clinical VI. 3.** Provides clinical and field experience for the athletic training student. Skill and knowledge

learned in KIN 3052, 3058 AND 4052 are applied in the clinical and field settings. *Prerequisites:* KIN 4052 and 4068; concurrent enrollment in KIN 4058; minimum GPA of 2.50.

**4090 [PEPR 4090]. Foundations of Coaching. 3.** Coaches must be effective teachers, trainers, fund-raisers, recruiters, motivators, administrators, and counselors. The major purpose of this course is to provide future coaches with current information about the eight domains of essential coaching skills identified in the NSSC. These domains include philosophy and ethics, safety and injury prevention, physical conditioning, growth and development, teaching and communication, sport skills and tactics, organization and administration, and evaluation. Dual listed with KIN 5090. *Prerequisites:* junior status and 2.5 cumulative GPA.

**4097 [PEPR 4097]. Individual Problems. 1-3 (Max. 6).** Provides flexible credit for juniors and seniors who wish to undertake intensive study of a special problem in physical education. Offered S/U grade only. *Prerequisites:* junior status and 2.50 GPA.

**4099 [PEPR 4099]. Student Teaching in Physical Education. 1-16 (Max. 16).** Student teaching is the culminating experience required of all students in teacher education for graduation and recommendation for certification. Consists of full-time assignment of 16 weeks in an approved school station in Wyoming under supervision of an experienced, approved supervising teacher. Offered for S/U grade only. *Prerequisites:* Completion of KIN 4012 and 4017; 2.5 GPA; consent of coordinator of student teaching in physical education.

**4900. Topics in: \_\_\_\_\_. 1-3 (Max. 9)** The study of current topics not included in more formal course offerings in kinesiology and health. *Prerequisite:* KIN 3021.

**5001. Short Course. 1-6 (Max. 6).** Used for special topics in physical education on the basis of need. Each department in the college may make offerings under this number, the maximum allowable credit for each department is 6 semester hours. Offered satisfactory/unsatisfactory only. *Prerequisite:* graduate standing.

**5012. Curriculum Design in Physical Education. 3.** Addresses current problems of curriculum design and development in physical education, including foundational concerns, curriculum anatomy (aims, goals, objectives, content, evaluation), and problems associated with design (scope, sequence, relevance, continuity, articulation, balance, and integration). *Prerequisite:* graduate standing, completion of a teacher certification program in physical education and teaching experience or permission of school.

**5013. Spectrum of Teaching Styles. 3.** Explores the range of teaching styles and the appropriateness of their uses. Cross listed with HLED 5013. *Prerequisite:* graduate standing.

**5014. Teaching Tactics in Sport-Based Physical Education. 3.** Introduces students to the instructional strategy of the Tactical Games Approach (Mitchell, Oslin, & Griffin, 2006) of teaching sport-based activities in physical education. Emphasis is on planning, implementing, assessing and evaluating the tactical approach within the K-12 physical education context. *Prerequisite:* graduate standing.

**5016. Analysis and Supervision of Teaching in Physical and Health Education. 3.** Introduces various evaluative and supervisory techniques which are designed to improve teaching effectiveness and student learning. Emphasis will be placed on utilizing various strategies of evaluation in instructional settings. *Prerequisite:* graduate standing.

**5017. Research on Teaching Physical and Health Education. 3.** Survey of techniques, paradigms, and findings of research on teaching. Cross listed with HLED 5017. *Prerequisite:* graduate standing.

**5018. Psychology of Teaching Physical Education. 3.** Weaves together theory, research, and practical information related to the psychological aspects of teaching physical education. It shows how you can use psychological principles and strategies to manage behavior, motivate students, achieve program goals, and establish a positive learning environment. *Prerequisite:* Acceptance into Kinesiology and Health Masters program.

**5020. Modalities and Administration in Athletic Training. 3.** Emphasis on professional development and ability to research and compile information. Students will have opportunity to develop administrative skills related to the day-to-day operations of an athletic training room including budgeting, ordering, inventory, and facility maintenance. Students will develop an understanding of hiring practices within a healthcare facility. *Prerequisites:* Graduate level standing, NATA-BOC certification, and a Graduate Assistant Athletic Trainer in the Athletic Department.

**5021. Pharmacology and Rehabilitation in Athletic Training. 3.** Emphasis is on professional development and ability to research and disseminate information. Students will recognize and understand the pharmacokinetics of commonly prescribed medications in the athletic setting. Students will research injuries and develop rehabilitation programs to be presented to the athletic training staff and vari-

ous medical providers within the community. *Prerequisites:* Graduate level standing, NATA-BOC certification, and a Graduate Assistant Athletic Trainer in the Athletic Department.

**5022. Surgical Procedures and Post-operative Care. 3.** Students will watch orthopedic surgeries and develop a sound understanding of common surgical techniques and procedures. Emphasis will be placed on understanding the anatomical structures, appropriate post-operative care, and rehabilitation techniques. *Prerequisites:* Graduate level standing, NATA-BOC certification, and a Graduate Assistant Athletic Trainer in the Athletic Department.

**5023. Advanced Rehabilitation in Athletic Training. 3.** Students will be provided opportunities to continue to increase their clinical evaluation skills and develop advanced rehabilitation protocols. Emphasis will be placed on the importance of using evidence based medicine and the ability to critically evaluate peer-reviewed research. *Prerequisites:* Graduate level standing, NATA-BOC certification, and a Graduate Assistant Athletic Trainer in the Athletic Department.

**5024. Physical Activity Epidemiology. 3.** This course will examine physical activity from a public health perspective. Topics include study design, critical appraisal of research, assessment of physical activity, relationships between physical activity and health outcomes, and current issues in physical activity epidemiology. Dual listed with KIN 4024. *Prerequisite:* KIN 3021.

**5025. Exercise Physiology II. 2-4 (Max. 4).** Provides interested students with an additional opportunity to study selected aspects of exercise physiology. Research and investigation are emphasized. *Prerequisite:* graduate standing.

**5029. Methods of Training and Conditioning. 3.** Upper-level applied exercise training and conditioning course aimed at giving students the knowledge and experience needed to develop and lead exercise training programs. It will be of interest to teachers, coaches, and fitness leaders. Dual listed with KIN 4029. *Prerequisite:* junior standing, KIN 3021 and a minimum 2.50 GPA.

**5034. Lifespan Growth and Psychomotor Development. 3.** Takes a scholarly approach to the subject of psychomotor development, with particular emphasis on the theoretical and scientific examination of motor behavior as it changes over time. Emphasis is placed on observing movement and analyzing changes in it. *Prerequisites:* graduate standing, KIN 3034 or equivalent.

**5035. Sociology of Sport. 3.** Study of the social aspects of sport and play. Includes concepts, research studies, and theories related to such topics as politics, economics, crowd behavior, religion, sexual identity and gender, and ethical and moral values related to sport. *Prerequisites:* graduate standing and a general sociology course.

**5038. Advances in Research on Sport Expertise. 3.** Examines the science behind the skill acquisition in sport and explores the application of science to optimal training for achieving and retaining elite performance. Different theories will be compared to reveal how “perfection” is made by “practice.” *Prerequisites:* graduate standing with experience of taking undergraduate courses in Motor Behavior, Cognitive Psychology, Sport Psychology, or Coaching.

**5039. Perception and Action in Motor Skills. 3.** For graduate students who have general interest in understanding how the human perceptual system is coping with the human action system in performing skilled motor tasks. An overview of the existing theories and studies in the field will be provided with sufficient breadth and depth. *Prerequisite:* undergraduate prerequisite course in one of the following areas: Motor Behavior (Motor Learning, Control, or Development); Cognitive Psychology; Human Biomechanics; Human Physiology.

**5046. Applied Biomechanics and Programming. 3.** Understand advanced biomechanical theories and utilize MATLAB programming to perform signal process and calculate 3-dimensional ground reaction force, center of pressure, electromyography, and 2-dimensional and 3-dimensional kinematics and kinetics. Emphasize on computational biomechanics and code writing in MATLAB. *Prerequisite:* KIN 3042, graduate standing.

**5047. Biomechanics in Sports. 3.** Understand the biomechanics of selected sports and the procedures to perform biomechanical analysis of sports techniques. Understand the characteristics of different loadings and their effects on human bodies and the biomechanical mechanisms of sports injuries. *Prerequisite:* KIN 3042, graduate standing.

**5056. Advanced Exercise Testing and Prescription. 4.** Teaches foundational electrocardiography to perform graded exercise stress tests (GXT), performance GXTs to health and diseased populations based on a health appraisal assessment. Knowledge used to develop comprehensive exercise prescriptions, make metabolic calculations. Emphasis on how physical activity, nutrition/weight

management, and behavioral factors interact with exercise programming. Dual listed with KIN 4056. *Prerequisites:* completion of KIN 3010 and 3021; 2.5 GPA; CPR certification.

**5062. Applied Concepts in Human Aging. 3.** Designed to integrate and apply concepts acquired in core KIN and HLED courses (e.g. human physiology, health promotion, etc.) to the growing population of older/aging adults. Age-related pathologies are presented and discussed as is the scientific method. Dual listed with KIN 4062. *Prerequisites:* KIN 3021; minimum 2.50 GPA; junior standing.

**5080. Investigations in Kinesiology and Health. 1-3 (Max. 3).** Designed to develop Master of Science level graduate students into critical consumers of research. An additional purpose is to develop research skills to the level necessary to complete a master of science Plan B paper. Cross listed with HLED 5080. *Prerequisite:* graduate standing.

**5085. Research Methods. 3.** Focuses on methods and techniques for evaluating and conducting research. Potential and completed research problems are analyzed and evaluated. Research processes are reviewed with emphasis on application. Standards for writing literature reviews and research proposals are also emphasized. *Prerequisite:* admission to the UW Division of Kinesiology and Health's graduate program.

**5086. Qualitative Research Methods. 3.** This course presents students with an introduction to qualitative research methods, designs, and analysis. This involves: creation of purpose statement and research questions, development of designs, hands-on data collection, data analysis, and writing up qualitative studies. Issues related to trustworthiness, ethics, credibility, and transferability of qualitative research will be addressed. *Prerequisite:* graduate standing.

**5090. Foundations of Coaching. 3.** Coaches must be effective teachers, trainers, fundraisers, recruiters, motivators, administrators, and counselors. The major purpose of this course is to provide future coaches with current information about the eight domains of essential coaching skills identified in the NSSC. These domains include philosophy and ethics, safety and injury prevention, physical conditioning, growth and development, teaching and communication, sport skills and tactics, organization and administration, and evaluation. Dual listed with KIN 4090. *Prerequisite:* graduate status.

**5097. Individual Problems. 1-3 (Max. 6).** Provides flexible credit for students who wish to undertake intensive study of a special

problem identified in a regular class. Cross listed with HLED 5097. *Prerequisite:* graduate standing.

**5536. Sport Psychology. 3.** Examines theoretical, research, and professional issues in contemporary sports psychology. Basic research design, including quasi-experimental design are covered, particularly to discuss the outcome studies or proposed applications such as imagery and hypnosis. Development of applied sport psychology and proposed interventions with sport behavior are viewed in relation to the development of these approaches, related training issues and outcome research. Identical to PSYC 5536. *Prerequisites:* graduate standing, sport or general psychology course, and consent of instructor.

**5537. Exercise Psychology. 3.** Focuses on key conceptual issues and research in exercise psychology and the application of research findings in a variety of physical activity settings. Specific content areas include psychological benefits of physical activity, exercise adherence, public health and exercise issues, theory, and determinants of physical activity, interventions for adoption and maintenance, and professional ethics. *Prerequisites:* graduate standing, KIN 3037.

**5586. Seminar. 1-6 (Max. 8).** Graduate students in kinesiology and health work intensively on current issues and problems, and may pursue specific areas of emphasis. Although a total of 8 hours is permitted under this number, only 6 hours are allowed by the Division of Kinesiology and Health toward a student's graduate program. Cross listed with HLED 5586. *Prerequisite:* graduate standing.

**5587. Special Problems. 1-6 (Max. 9).** Provides a broad perspective through selected reading material and wherever possible the student collects and uses original information in practical school situations. All work is done independently under the direction of a faculty member. As many conferences are held as necessary to assure successful completion of the project. *Prerequisite:* consent of instructor and division director, graduate status.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5980. Dissertation Research. 1-12 (Max. 48).** Graduate level course designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate degree program.

**5990. Internship. 1-12 (Max. 24).** *Prerequisite:* graduate standing.

## Health Education (HLED)

**1006. Personal Health. 3.** Acquaints students with a variety of personal health issues: from the importance of physical activity and exercise, to how to manage stress and social pressures. Students learn how to better care for their bodies and change and modify health behaviors that could be detrimental. Students also learn how to improve their current state of overall health and well being.

**1221. Standard First Aid and Personal Safety. 1-2 (Max. 2).** Studies accident prevention, examination procedures and first aid care for victims of accidents or sudden illness before medical assistance is available. Presents new Red Cross content and CPR. CPR is incorporated in the sections offered for 2 credit hours.

**2006. Health for Elementary Educators. 1.** Acquaints students to the Wyoming Health Standards and Benchmarks, techniques/instruments for assessing they Wyoming Health Standards and Benchmarks, sample health curriculum models/approaches for elementary school K-6, lesson plans in health education for elementary learners, and health integration in language arts curricula. *Prerequisite:* elementary education majors with sophomore standing.

**2221. Instructor's Course in First Aid/CPR 2.** Designed to certify the student to teach the following American Red Cross courses: CPR for the professional rescuer and First Aid: responding to emergencies. *Prerequisite:* current certification in First Aid/CPR.

**2900. Topics In: \_\_. 1-3 (Max. 3).** Course Topics could include Peer Health Education, Current Issues in Health, etc. *Prerequisite:* sophomore standing.

**3000. Foundations of Health Promotion and Health Education. 3.** Introduces basic concepts and theories that form the foundation of the health promotion and education profession. Stresses experiences that are designed to acquaint students with the fundamentals of professional practice and to serve as a basis for future health promotion and education study. *Prerequisites:* HLED 1006, junior class standing, 2.5 GPA.

**3020 [4050]. Community and Public Health. 3.** Public health aim to create the conditions where people can be healthy. This course introduces goals and applications of community and public health work in the US, illustrated with case studies from the most urgent health issues facing our nation. *Prerequisites:* HLED 1006; sophomore or junior standing; admission to K&HP or K&HP-AT professional program or minimum 3.00 cumulative UW GPA.

**4004. Needs Assessment and Program Planning. 3.** Focuses on needs assessment and program planning in the health education process. Extensive time is spent learning, analyzing, and applying a variety of needs assessment methods. The impact of extensive community needs assessment on planning effective community programs and interventions are examined. Additional emphasis is placed on the methods necessary for planning effective health promotion programs. Dual listed with HLED 5004. *Prerequisites:* HLED 3000 and 2.5 GPA.

**4010. Program Evaluation and Grant Writing. 3.** Provides students with an in-depth examination of program evaluation techniques and methodology as they apply to the evaluation of health promotion programs. Students gain an understanding of how to identify funding opportunities (grants) and how to prepare grant proposals. Dual listed with HLED 5010. *Prerequisites:* HLED 4004.

**4015. Internship Experience in Health. 1-12 (Max. 12).** An internship experience in health education/promotion for health majors. May take from 1-12 credits at a time for a required cumulative maximum of 12 credits. S/U only. Cross listed with KIN 4015. *Prerequisites:* minimum 2.50 GPA; junior or senior status.

**4016. Research Experience in Kinesiology and Health. 3-6 (Max. 6).** Offered to students who wish to gain a research experience in Kinesiology and Health. Meant for students who are interested in pursuing an advanced degree. Students may choose to complete KIN/HLED 4016 instead of KIN/HLED 4015. Cross listed with KIN 4016. *Prerequisites:* minimum junior standing; completed KIN 3021; minimum 2.50 GPA.

**4020. Food, Health, and Justice. 3.** Maps ways our dominant national and global food systems affect health and equity in health, largely though not only negatively. Students will critically assess practiced and potential strategies for creating alternative food systems that support health and equity, particularly at the U.S. community level. Dual listed with HLED 5020. *Prerequisites:* junior standing and above.

**4025. Teaching Sensitive Issues In Human Sexuality. 3.** Prepares educators and other helping professionals whose work involves promoting healthy sexuality in children, young people, and adults. It also provides detailed investigation into important aspects of teaching sensitive issues related to human sexuality. Students practice, critique, develop, and evaluate sexuality education processes and resources. Dual listed with HLED 5025. *Prerequisites:* junior class standing, 2.5 GPA, and SOC 2200.

**4040. Stress Management. 3.** The stress process and its relationship to the concept of total health. The physical and psychological effects of stressors and individual appraisals will be explained using theoretical models and practical examples. Students learn how to personally identify and manage stress in a healthy manner. Emphasis is placed on learning effective skills to reduce harmful effects of stress. *Prerequisites:* junior class standing for HLED 4040 and graduate standing for HLED 5040.

**4074. Field Studies in \_\_\_\_\_. 1-5 (Max. 12).** Offered only through extension services. Broad and flexible and can be utilized in numerous situations to meet local needs. (Credit in this course is not applicable toward advanced degrees.) Cross listed with KIN 4074. Offered for S/U grade only.

**4097. Individual Problems. 1-3 (Max 6).** Provides flexible credit for students who wish to undertake intensive study and/or experiential activities in health education. Offered for S/U grade only. *Prerequisite:* consent of instructor.

**4110. Teaching Health in Schools K-12. 3.** Presented appropriate knowledge and skills to become health literate. Explore ways to teach health skills and knowledge and use assessment strategies for health education. *Prerequisite:* KIN 3015. (Offered fall semester)

**4120. Assessment in Health. 3.** Provide students with an understanding of components of a balanced assessment system in school health education. Students review the basics of standards-based health education and explore innovations in assessment that provide teachers and students with a more complete and authentic picture of student learning.

*Prerequisites:* HLED 2006, HLED 4110, or certified teacher with experience teaching health in schools; undergraduates must be concurrently enrolled in KIN 4099, Student Teaching; certified teachers must have access to K-12 students.

**4130. Management of Coordinated School Health Programs. 3.** Reviews the coordinated school health program (CSHP) model and identifies research that supports the eight components of the model. Prepares students to advocate for CSHP and to develop the school infrastructure necessary to carry out such a program. Also prepares individuals to work with school from job settings outside the school. Dual listed with HLED 5130. *Prerequisites:* HLED 1006 and 3010, junior standing and 2.5 GPA. (Offered fall semester)

**4900. Topics in: \_\_\_\_\_. 1-3 (Max. 9)** Integrates kinesiology and/or health concepts necessary for graduates in multiple professions. Provides experiential learning and training for success in allied healthcare fields. Students may develop and present projects that relate their education and training to a hypothetical workplace environment. *Prerequisite:* KIN 3021.

**4970. Field Experience in Health Education. 1 - 12 (Max. 12).** Offered as practical health education experience for senior level health education majors. Students may take from 1 -12 credits at a time for a required cumulative maximum of 12 credits. Broad and flexible and can be utilized in numerous situations to meet local needs. (Credit in this course is not applicable toward advanced degrees.) For S/U grade only. *Prerequisites:* senior standing and consent of instructor.

**5004. Needs Assessment and Program Planning. 3.** Focuses on needs assessment and program planning in the health education process. Extensive time will be spent learning, analyzing, and applying a variety of needs assessment methods. The impact of extensive community needs assessment on planning effective community programs and interventions will be examined. Additional emphasis will be placed on the methods necessary for planning effective health promotion programs. Dual listed with HLED 4004. *Prerequisite:* HLED 3000 or graduate status and a graduate course in research methods.

**5010. Program Evaluation and Grant Writing. 3.** Provides students with an in-depth examination of health promotion programs, evaluation techniques and methodology. Students will also gain an understanding of how to identify funding opportunities (grants) and how to prepare grant proposals. Dual listed with HLED 4010. *Prerequisite:* HLED 4004 or HLED 5004 and graduate standing.

**5013. Spectrum of Teaching Styles. 3.** Explores the range of teaching styles and the appropriateness of their uses. Cross listed with KIN 5013. *Prerequisite:* graduate status.

**5016. Analysis and Supervision of Teaching Physical Education. 3.** Students are introduced to various evaluative and supervisory techniques which are designed to improve teaching effectiveness and student learning. Emphasis is placed on utilizing various strategies of evaluation in instructional settings. *Prerequisite:* graduate standing

**5017. Research on Teaching Physical and Health Education. 3.** Survey of techniques, paradigms, and findings of research on teaching. Cross listed with KIN 5017. *Prerequisite:* graduate standing.

**5020. Food, Health, and Justice. 3.** Maps ways our dominant national and global food systems affect health and equity in health, largely though not only negatively. Students will critically assess practiced and potential strategies for creating alternative food systems that support health and equity, particularly at the U.S. community level. Dual listed with HLED 4020. *Prerequisites:* graduate standing.

**5025. Teaching Sensitive Issues in Human Sexuality. 3.** Prepares educators and helping professionals whose work involves promoting healthy sexuality in children, young people and adults. Also provides detailed investigation into important aspects of teaching sensitive issues related to human sexuality. Students practice, critique, develop, and evaluate sexuality education processes and resources. Dual listed with HLED 4025. *Prerequisite:* junior class status, GPA of 2.5 and SOC 2200.

**5035. Theories in Health Promotion. 3.** Explores the variety of theories related to health education/promotion, comparing and contrasting them when necessary, synthesizing them when appropriate. An additional purpose will be to apply these theories to either a research problem/question or a practice setting. *Prerequisite:* graduate standing.

**5040. Stress Management. 3.** The stress process and its relationship to the concept of total health. The physical and psychological effects of stressors and individual appraisals are explained using theoretical models and practical examples. Students learn how to personally identify and manage stress in a healthy manner. Emphasis is placed on learning effective skills to reduce harmful effects of stress. Dual listed with HLED 4040. *Prerequisite:* graduate standing.

**5050. Community and Public Health Promotion. 3.** Identifying, understanding, and working with unique needs and assets of communities is emphasized, including eth-

nic, religious, and social structures. Planning and implementation of community health programs is stressed. Open but not limited to students interested in the following areas: healthcare, health promotion, public health, the schools. Dual listed with HLED 4050. *Prerequisite:* a minimum of 6 hours of coursework within the College of Health Sciences or min. of 9 hours of coursework within selected major.

**5080. Investigations in Kinesiology and Health. 1-3 (Max. 3).** Designed to develop master of science level graduate students into critical consumers of research. An additional purpose is to develop research skills to the level necessary to complete a master of science Plan B paper. Dual listed with KIN 5080. *Prerequisite:* graduate standing.

**5085. Research Methods in Health Education. 3.** Focuses on methods and techniques for evaluating and conducting research. Potential and completed research problems are analyzed and evaluated. Research processes are reviewed with emphasis on application. Standards for writing literature reviews and research proposals are also emphasized. Cross listed with KIN 5085. *Prerequisite:* admission to the UW Division of Kinesiology and Health's graduate program.

**5097. Individual Problems. 1-3 (Max. 6).** Provides flexible credit for students who wish to undertake intensive study of a special problem identified in a regular class. Cross listed with KIN 5097. *Prerequisite:* graduate standing.

**5115. Interdisciplinary Early Childhood Seminar. 3.** Advanced professional course for students interested in current trends and issues in early childhood development. Interdisciplinary in nature, drawing from research in communication disorders, kinesiology and health, elementary and early childhood education and special education, child and family studies, nursing, and psychology. Cross listed with FCSC, EDEC, NURS, PSYC, SPPA 5115. *Prerequisite:* graduate standing.

**5130. Management of Coordinated School Health Programs. 3.** Reviews the coordinated program (CSHP) model and identifies research that supports the eight components of the model. Prepares students to advocate for CSHP and to develop the school infrastructure necessary to carry out such a program. Also prepares individuals to work with school from job settings outside the school. Dual listed with HLED 4130. *Prerequisites:* HLED 1006 and 3110, junior standing and 2.50 GPA.

**5586. Seminar in Health Education. 1-6 (Max. 8).** Graduate students in kinesiology and health work intensively on current issues and problems, and may pursue specific areas

of emphasis. Although a total of 8 hours is permitted under this number, only 6 hours are allowed by the Division of Kinesiology and Health toward a student's graduate program. Cross listed with KIN 5586. *Prerequisite:* graduate standing.

**5587. Special Problems. 1-6 (Max. 9).** Provides a broad perspective through selected reading material and/or experiential activities. All work is done independently under the direction of a faculty member. As many conferences are held as necessary to assure successful completion of the project. *Prerequisite:* consent of instructor and graduate standing.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

## Life Sciences Program

138 Aven Nelson Building, 766-4158

FAX: (307)766-2851

Web site: [www.uwyo.edu/lifescience](http://www.uwyo.edu/lifescience)

Program Director: Mark E. Lyford

The Life Sciences Program consists of all LIFE prefix courses. These courses support the life science majors and several non-life science majors across campus. The number of LIFE courses taken by life science and other majors is determined by the departments that offer the majors. The curriculum intends to provide life-science majors with both breadth and depth in the basic life sciences, and non-science majors with exposure to key concepts in biology and an understanding of the connections between science and society. The program courses also expose students to the fields of cell and molecular biology, genetics, ecology, and evolution, and they familiarize students with the diversity of life on the planet. Courses within the curriculum address four

fundamental goals at a level appropriate for each course: 1) Acquisition, Application and Synthesis of Knowledge, 2) Communication Skills, 3) Critical Thinking and Problem Solving, and 4) Research Skills.

For information on LIFE course offerings, please refer to the Life Sciences Program entry in the College of Arts and Sciences.

## Division of Medical Education

### Family Medicine Residency Programs

**Casper:** Stephan Trent, Director  
(307) 233-6020

**Cheyenne:** Ronald L. Malm, Director  
(307) 777-7911

### WWAMI Medical Education Program

**Laramie:** Tim Robinson, Director  
(307) 766-2496

Web site: [www.uwyo.edu/wwami](http://www.uwyo.edu/wwami)

### Professors:

**ALISON DOHERTY,** Clinical Professor  
2015.

### Associate Professors:

**LISA K. BRANDES,** B.S. Kansas State University 1987; M.D. University of Kansas School of Medicine 1993; Clinical Associate Professor of Family Medicine 2012.

**JAMES F. BROOMFIELD,** B.S. University of Arkansas 1986; M.D. 1990; Associate Professor of Family Medicine, Cheyenne 2005, 1999.

**RONALD L. MALM,** B.S. University of Wyoming 1988; D.O. The University of Health Sciences, College of Osteopathic Medicine 1992; Associate Professor of Family Medicine, Cheyenne 2012, 2005, 1999.

**DOUGLASS S. PARKS,** B.S. Baker University 1978; M.D. University of Kansas 1984; Associate Professor of Family Medicine, Cheyenne 1999, 1993.

**BETH ROBITAILLE,** B.A. University of Notre Dame 1991; M.D. Creighton University School of Medicine 1995; Clinical Associate Professor of Family Medicine, Casper 2012, 2007, 2002.

**STEPHAN N. TRENT,** B.A. University of Tennessee 1973; D.O. University of Health Sciences 1980; Clinical Associate Professor of Family Medicine 2007, 2002.

**BRIAN M. VEAUTHIER,** B.S. University of Notre Dame 1996; M.D. Georgetown University School of Medicine 2001; Clinical Associate Professor of Family Medicine 2012.

**Assistant Professors:**

**KIM R. BROOMFIELD**, B.S. University of Wyoming 1987; B.S. 1988; M.D. University of Colorado 1992; Clinical Assistant Professor of Family Medicine Cheyenne 2012, 2009.

**WHITNEY A. BUCKLEY**, PharmD University of Wyoming 2004; Clinical Assistant Professor 2008.

**MARIA A. CORNELIUS**, Clinical Assistant Professor 2012.

**JANNA CRUMPTON**, Pharm.D. Creighton University 2011; Clinical Assistant Professor Cheyenne 2012.

**ZACH DEISS**, B.A. University of Wyoming 1979; M.D. Creighton University School of Medicine 1987; Clinical Assistant Professor of Family Medicine Casper 2012, 2010.

**JOHN P. HEALEY**, B.S. University of Wyoming 1979; M.S. University of Utah; M.D. Creighton University 1991; Clinical Assistant Professor of Family Medicine Cheyenne 2012, 2009.

**CAROLINE KIRSCH RUSSEL**, Clinical Assistant Professor 2012.

**ROBERT M. MONGER**, B.A. Augustana College 1988; M.D. University of Utah School of Medicine 1992; Clinical Assistant Professor 2008.

**DIANE NOTON**, B.S. University of Wyoming 1991; M.D. Creighton University 1995; Clinical Assistant Professor of Family Medicine Cheyenne 2009.

**SHARON KARNES OLAND**, B.S. University of Washington School of Medicine 1997; M.D. University of Washington School of Medicine 2001; Clinical Assistant Professor of Family Medicine Casper 2012.

**THOMAS E. RADOSEVICH**, B.S. University of Wyoming 1990; M.D. Creighton University School of Medicine 1999; Clinical Assistant Professor of Family Medicine 2012, 2008.

**CORA SALVINO**, B.S. Purdue University 1975; M.D. Chicago Medical School 1978; Clinical Assistant Professor of Family Medicine Casper 2010.

**G. DOUGLAS SCHMITZ**, B.S. and M.D. University of Nebraska Medical School 1979; Clinical Assistant Professor 2008.

**AMY TRELEASE-BELL**, B.S. University of Wyoming 1992; M.D. Creighton University School of Medicine 1996; Clinical Assistant Professor of Family Medicine, Cheyenne 2012, 2004.

**CYNTHIA WORKS**, Clinical Assistant Professor 2012.

**PATRICK A. YOST**, B.S. University of Wyoming 1994; M.D. Creighton University 1999; Clinical Assistant Professor of Family Medicine Cheyenne 2012, 2009.

The Division of Medical Education provides opportunities for qualified Wyoming students to pursue careers in medicine; supports both undergraduate and graduate medical education programs; promotes high quality continuing education in medicine and other health care fields for Wyoming providers; facilitates increased accessibility of health and medical services in remote and shortage areas; supports interdisciplinary clinical training; and works closely with the Center for Rural Health Research and Education to promote research and programs to address rural/frontier health delivery concerns.

The University of Wyoming medical contract program enhances medical education opportunities for Wyoming residents. In March 1996, the University of Wyoming became a partner in the WWAMI (Washington, Wyoming, Alaska, Montana, Idaho) Program. As a result, students accepted into the medical contract program attend the University of Washington School of Medicine. The first year of this program is taught on campus at the University of Wyoming. The doctor of medicine degree is awarded by the University of Washington. For further information, contact the Preprofessional Advising Office, College of Health Sciences, Laramie, Wyoming 82071, (307) 766-6704.

Because of the need for broadly trained primary care physicians in Wyoming, the Wyoming Legislature has established two residency programs in the specialty of family medicine. These two accredited, university-administered, community-hospital based family medicine residency programs are located in Casper and Cheyenne. They enroll up to 42 residents (14 in each of three years). The two family medicine centers are among the most modern and comprehensively equipped facilities of their kind in the nation and maintain a 1:4 faculty to resident ratio. The program at Casper began in 1976 and is affiliated with Wyoming Medical Center. The program utilized the services and facilities provided by the Community Health Center of Central Wyoming. The Cheyenne program became active in 1980 and is affiliated with United Medical Center. The program utilizes the services and facilities provided by the Veterans Administration and the FE Warren AFB hospitals also located in Cheyenne. Both centers utilize modern design and include spacious examining rooms; treatment and casting rooms; x-ray facilities; offices for faculty, residents and staff; complete laboratories; multiphasic research areas; conference rooms; business offices and roomy waiting rooms with

play areas in the clinical component. In the educational component, both include large auditoriums, several classrooms; audio visual production centers; medical libraries; learning resource centers and administrative offices. Particular emphasis in both centers is placed on preparing physicians for rural practice and other facets of medical practice that are unique to Wyoming.

**Wyoming WWAMI Medical Education Program**

<b>FIRST YEAR: Fall</b>		<b>Hrs.</b>
HM	6510 .....	4
HM	6511 .....	6
HM	6512 .....	4
HM	6513 .....	1
HM	6514 .....	3
HM	6516 .....	2
HM	6522 .....	2
HM	6524 .....	2
HM	6526 .....	1
HM	6590 .....	1
<b>Total Hrs.</b>		<b>26</b>

<b>FIRST YEAR: Spring</b>		<b>Hrs.</b>
HM	6520 .....	4
HM	6521 .....	4
HM	6523 .....	2
HM	6531 .....	4
HM	6532 .....	5
HM	6534 .....	2
HM	6535 .....	3
<b>Total Hrs.</b>		<b>24</b>

**Graduate Study**

The Division of Medical Education provides graduate medical (residency) education for physicians in the specialty of family medicine. The university supports two fully accredited family medicine residency programs in Casper and Cheyenne with a capacity for 42 residents (14 in each of the three years). The Casper program began in 1976 and is affiliated with the Community Health Center of Central Wyoming and the Wyoming Medical Center. The Cheyenne program opened in 1980 and is affiliated with Cheyenne Regional Medical Center. In addition, the Cheyenne program has a close working relationship with the Veterans Administration Hospital. The residency programs are housed in two family medicine centers acclaimed to be among the most modern and comprehensively equipped facilities of their kind in the nation. Particular emphasis is placed on preparing physicians for rural practice and addressing those facets of medical practice that are unique to Wyoming.



In 1997, the University of Wyoming joined the University of Washington's WWAMI Program to provide undergraduate medical education for the students of Wyoming. Medical students accepted into this program (WWAMI) take their first year of classes on campus at the University of Wyoming. Students interested in this program should contact the WWAMI office in the College of Health Sciences at (307) 766-2496.

## Human Medicine (HM)

**6506. Clinical Preceptorship. 1.** Students spend one morning or afternoon per week for approximately 10 weeks in a clinical setting. Students observe the practice of the physician and engage in one on one feedback sessions with the physician. The goal of the experience is to become comfortable in the clinical setting, observe clinical techniques, observe the patient-doctor interactions, and observe the healthcare team. Students should have an opportunity to discuss professional and personal aspects of a particular specialty practice including the business side of the practice. *Prerequisite:* enrollment in or completion of HM 6513, 6522, or 6535.

**6510. Microscopic Anatomy: Histology. 4.** Lecture/laboratory in microscopic anatomy designed to provide principles/concepts of histology, define morphological characteristics of cells, tissues, organs of human body and relate this information to functional processes studied in concurrent and subsequent courses. For S/U only. *Prerequisites:* admission to the WWAMI program or consent of instructor and approval of WWAMI coordinator or dean of the College of Health Sciences.

**6511. Anatomy and Embryology. 6.** Structural organization of human body at the macroscopic level to provide a foundation for physical examination and functional assessment of the human organism. Integrates embryological development with study of cadaver and examination of normal living body. Concentrates on exploration of the body cavities and viscera they contain. For S/U only. *Prerequisites:* admission to the WWAMI program or consent of instructor and approval of WWAMI coordinator or the dean of the College of Health Sciences.

**6512. Mechanisms in Cell Physiology. 4.** Physiology of cell membrane, ionic and electrical gradients; active transport, excitability, action potentials; biophysics of sensory receptors; neuromuscular transmission; muscle energetics/contractility; spinal reflexes and central synaptic transmission; autonomic nervous system; energy metabolism and tem-

perature regulation; epithelial transport; gastrointestinal motility and secretions. For S/U only. *Prerequisites:* admission to the WWAMI program or consent of instructor and approval of WWAMI coordinator or the dean of the College of Health Sciences.

**6513. Introduction to Clinical Medicine. 1.** Instruction in communication skills and interview techniques to form the basis for the doctor-patient relationship and for the skills of communication with patients. The patient profile is obtained. Attention to developing comfort in the physician role. For S/U only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or dean of the College of Health Sciences.

**6514. Biochemistry 1A. 3.** First portion of a coordinated course covering classical molecular and cellular biochemistry, cellular physiology and molecular genetics. Metabolic interrelationships as they occur in the individual are stressed and related to disturbances in disease states. For S/U only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or the dean of the College of Health Sciences.

**6516. Systems of Human Behavior. 3.** Sensitizes students to the impact of such factors as emotional and physical development, cultural backgrounds, social roles, families, sexual identities and belief systems upon their effectiveness as physicians. Teaches skills in analyzing behavior, defining behavioral objectives and designing precise treatment strategies to attain these objectives. For S/U only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or the dean of the College of Health Sciences.

**6521. Microbiology and Infectious Disease 1A. 4.** Pathogenesis and immunity of infectious diseases, natural barriers. Microbiology, epidemiology, clinical manifestations and control of representative bacterial, fungal, parasitic and viral infectious diseases. Chemotherapeutics and principles of chemotherapy. Sterilization, principles of asepsis, nosocomial and iatrogenic infections and their prevention. For S/U only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or the dean of the College of Health Sciences.

**6522. Introduction to Clinical Medicine. 2.** Medical history is introduced and instruction in data collection is begun. Experience in conducting medical interviews with patients to obtain the medical history and patient profile. Special problems related to interview-

ing are addressed. For S/U Only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or dean of the College of Health Sciences.

**6523. Introduction to Immunology. 2.** Basic concepts such as antigens; antibodies; complement; B- and T-lymphocyte functioning, including interactions with each other and with accessory cells; immunological tolerance; major histocompatibility complex; and role of these basic concepts in immunopathology (immunodeficiencies, hypersensitivities, autoimmunity, blood transfusion, and transplantation). For S/U only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or dean of the College of Health Sciences.

**6524. Biochemistry 1B. 2.** Second portion of a coordinated course covering classical molecular and cellular biochemistry, cellular physiology and molecular genetics. Metabolic interrelationships as they occur in the individual are stressed and related to disturbances in disease states. For S/U only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or dean of the College of Health Sciences.

**6531. Anatomy of Head and Neck. 4.** Gross anatomy (including skull, pharynx and larynx), audition and balance, physiology and clinical evaluation, maxillofacial disorders, diseases of nasal passages, nasopharynx and oropharynx, accessory sinuses. Physical examination. For S/U only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or dean of the College of Health Sciences.

**6532. Nervous System. 5.** Integrated approach to normal structure and function of the nervous system, including the eye. Neuropathological examples, as well as clinical manifestations of neurological disease are presented. For S/U only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or dean of the College of Health Sciences.

**6534. Microbiology and Infectious Disease 1B. 2.** Pathogenesis and immunity of infectious diseases, natural barriers. Microbiology, epidemiology, clinical manifestations and control of representative bacterial, fungal, parasitic and viral infectious diseases. Chemotherapeutics and principles of chemotherapy. Sterilization, principles of sepsis, nosocomial and iatrogenic infections and their prevention. For S/U only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or dean of the College of Health Sciences.

**6535. Introduction to Clinical Medicine.**

**3.** Adult screening physical examination is taught through the use of lecture, audiovisual aids, and small group tutorial, where students in supervised setting practice the physical examination on one another. Further practice in the performance and recording of the patient profile and medical history. For S/U only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or dean of the College of Health Sciences.

**6553. Musculoskeletal System. 5.** Gross, surface, applied and X-Ray anatomy of system including entire spine but excluding head and neck. Histology of bone, cartilage, tendon-motendinal junction and joints. Musculoskeletal trauma and healing. Pathology and clinical manifestations of other degenerative, inflammatory, metabolic, nutritional and congenital disorders. Physical examinations. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or Dean of the College of Health Sciences.

**6590. Medical Information for Decision Making. 1.** Evidence Based Medicine (EBM) is now the predominant model by which medicine is practiced. The goal is to forge critical thinking skills and to teach analysis of the medical literature as a tool. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or dean of the College of Health Sciences.

**6602. Introductory Primary and Continuity Care Clerkship. 2.** Introduces medical students to continuity of care by working with practicing physicians. The course demonstrates how to work with an individual to help them achieve optimal health, and includes topics in primary and preventative care, geriatrics, rehabilitation, palliative care, behavioral health and pain management. *Prerequisite:* Must be enrolled in the WWAMI Medical Education Program.

**6603. Clinical Studies. 2.** Instruction in communication skills, interviewing techniques, physical examination, documentation and clinical reasoning. The course will include hospital based patient encounters and developing comfort and introduction to the physical role. *Prerequisite:* Must be enrolled in the WWAMI Medical Education Program.

**6610. Molecular and Cellular Basis of Disease. 8.** Introduces cell physiology and cell biology, function, genetics, and genetic diseases, genes. Topics include membrane physiology; sensory receptors; muscle energetics and contractibility; autonomic nervous system; tissue response to disease; pharmacodynamics and pharmacokinetics; genetic disorders; pharma-

cogenetics. Incorporates relevant fundamental principles in anatomy, pathology, and pharmacology. *Prerequisite:* Must be enrolled in the WWAMI Medical Education Program.

**6620. Invaders and Defense. 7.** Systems addressed include the immune system, microbial biology, infectious diseases, inflammation and repair, and skin and connective tissue. Topics discussed include the pathogenesis and immunity of infectious disease, immunodeficiencies, hypersensitivity, autoimmunity, the basis of immunologic diagnostics. Additionally, this course will include relevant fundamental scientific principles in anatomy, pathology, and pharmacology. *Prerequisite:* Must be enrolled in the WWAMI Medical Education Program.

**6630. Circulatory System. 11.** Provides an interdisciplinary approach to cardiovascular, respiratory, and renal-urinary medicine, including anatomy, physiology, radiology, pathology, medicine, and surgery. Topics include cardiac electrophysiology and cardiac muscle mechanics, myocardial infarction and cardiac repair, thoracic and pulmonary anatomy, ventilatory mechanics, gas exchange, obstructive, restrictive, and pulmonary-vascular diseases, renal function, and common kidney diseases. *Prerequisite:* Must be enrolled in the WWAMI Medical Education Program.

**6640. Blood and Cancer. 3.** Introduces students with the basic pathophysiologic mechanisms leading to disturbances of red cell, white cell, and platelet production, as well as abnormalities of hemostasis presenting clinical problems, with an emphasis on pathophysiology. Additionally, this course will include relevant fundamental scientific principles in anatomy, pathology, and pharmacology. *Prerequisite:* Must be enrolled in the WWAMI Medical Education Program.

**6650. Energetic and Homeostasis. 7.** Integrates discussions of metabolism, nutrition, obesity, diabetes, gastrointestinal/liver physiology and endocrinology, including physiology and pathology of digestion and hepatic function, principles and practice of clinical nutrition, endocrine metabolism, and clinically important endocrine pathophysiology. Relevant anatomy, pathology and pharmacology of the endocrine and gastrointestinal systems will be covered. *Prerequisite:* Must be enrolled in the WWAMI Medical Education Program.

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## Microbiology Program

**Program Director:** Gerard P. Andrews

**Phone:** (307) 766-3139

**FAX:** (307) 766-3875

**E-mail:** gandrews@uwyo.edu

The Bachelor of Science degree program in microbiology is organized as an interdepartmental major involving the collaborative teaching, advising and research expertise of more than 20 microbiology faculty from the Colleges of Arts and Sciences, Agriculture and Health Sciences. The program is administered by a program director and a coordinating committee which represents each of the participating colleges. Students may obtain their degree in the College of Agriculture and Natural Resources and Natural Resources. Please see the Microbiology section under the College of Agriculture and Natural Resources for list of faculty and program information.

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## Fay W. Whitney School of Nursing

**351A Health Sciences Center, 766-4312**

**FAX:** (307) 766-4294

**Web site:** www.uwyo.edu/Nursing

**Dean:** Mary E. Burman

**Associate Dean:** Susan H. Steiner

### Professors:

**DIANE BOYLE**, B.S.N. University of Maryland 1974; M.S.N. University of North Carolina 1982; Ph.D. University of Kansas 1990; Professor of Nursing 2013; Wyoming Excellence Chair in Nursing.

**MARY E. BURMAN**, B.S.N. University of Minnesota 1983; M.S. University of Michigan 1986; Ph.D. 1990; Professor of Nursing 2003; Dean of Nursing 2008.

**PAMELA N. CLARKE**, B.S.N. Wayne State University 1969; M.P.H. University of Michigan, Ann Arbor 1971; Ph.D. Wayne State University 1983; Professor of Nursing 2003.

### Associate Professor:

**ANN MARIE HART**, B.S.N. Medical College of Virginia 1991; M.S. University of Wyoming 1996; Ph.D. University of Colorado Health Sciences Center Denver 2003; Associate Professor of Nursing 2009.

**MARY ANNE PURTZER**, B.S.N. University of Nebraska 1975; M.A. University of Wyoming 2002; M.S. 2005; Ph.D. 2007; Associate Professor of Nursing 2014.

**Assistant Professor:**

**REBECCA CARRON**, B.S.N. Texas Christian University 1976; B.A. University of Wyoming 1997; M.S. 2006; Ph.D. University of Colorado 2014; Assistant Professor of Nursing 2014.

**SHELLY FISCHER**, B.S. University of Iowa 1982; M.S. University of Colorado Health Sciences 1995; Ph.D. University of Colorado, Anschutz Medical Campus 2014; Assistant Professor of Nursing 2013.

**SARAH KOOIENGA**, B.S.N. Rush University 1983; M.S.N. University of North Carolina at Chapel Hill 1988; Ph.D. Oregon Health Sciences University 2006; Assistant Professor of Nursing 2014.

**BARBARA ROBINSON**, B.S.N. Creighton University 1978; M.S.N. University of Southern Mississippi 1984; M.B.A. University of Colorado at Colorado Springs 1990; Ph.D. University of Colorado Health Sciences Denver 2008; Assistant Professor of Nursing 2011.

**JENIFER THOMAS**, B.S. Colorado State University 1994; M.S. Avila University 2000; M.S. Colorado State University 2007; Ph.D. 2008; Assistant Professor of Nursing 2010.

**Clinical Associate Professor:**

**SUSAN H. STEINER**, B.S.N. University of Michigan, Ann Arbor 1971; M.S. University of Wyoming 1988; Ph.D. 2001; Clinical Associate Professor 2009; Associate Dean of Nursing 2009.

**Clinical Assistant Professor:**

**ESTHER GILMAN-KEHRER**, B.S.N. University of Wyoming 1986; M.S. 1998; D.N.P. University of Colorado 2012; Clinical Assistant Professor 2014.

**NANCY MCGEE**, B.S.N. University of Wyoming 2005; M.S. 2007; D.N.P. University of Northern Colorado 2014; Clinical Assistant Professor 2015.

**J'LAIINE PROCTOR**, B.S.N. University of Wyoming 2000; M.S. 2003; Certificate-PMHNP 2007; D.N.P. University of Northern Colorado 2014; Clinical Assistant Professor 2014.

**Senior Lecturer:**

Holly Miller, Teresa Wolff

**Associate Lecturers:**

Mary Sue Hager, Linda Johnson, Kimberly Raska, Sherrie Rubio-Wallace, Candace Tull, Linda Williams

**Assistant Lecturers:**

Cheri Bellamy, Carole Susan Christman, Elizabeth Goodwin, Marilyn Hall, Deborah Nemetz, Candace Stidolph, Rachel Thomas, Ann Wislowski

**Adjunct and Part-time Faculty:**

Anna Atkinson, Catherine Beck, Karen Benjamin, Linda Clamp, Connie Coleman, Carrie Deselms, Nathan Eliason, Ann Enlow, Michael Enright, Marlene Ethier, Dawn Ford, Mary Gills, Julian Good, Debra Hamilton, Barbara James, Donna Kathan, Melanie Kawulok, Paula Kihn, Cheryl Koski, Alicia LePard, Sue Lowe, Teri Lund, Gayle Martinchick, Jamie Mathews, Amanda Molski, Marcia Newell, Kristy Nielson, Jeanine Niemoller, Jennifer Painter, Shawn Petrini, Denise Sarz, Patty Sherard, Cheryl Smith, Cynthia Smith, Deanne Sramek, Veronica Taylor, Lisa Thompson, Weldonna Toth, Reba Traylor, Brenda Vance, Holly Vause, Tracy Wasserburger, Mary Weber, Clarann Weinart, Robert Weinland, Wendy Wood, Cheryl Wrasper

**Emeriti:**

Beverly Taheri-Kennedy, Beverly McDermott, Fay W. Whitney, Norma Wilkerson

The Fay W. Whitney School of Nursing (FWWSON) has well established undergraduate and graduate programs. Undergraduate and graduate curricula at the FWWSO are based upon our philosophy of nursing (as outlined on the nursing website) and specified professional documents. The Essentials documents for baccalaureate and master's programs from the American Association of Colleges of Nursing serve as the primary foundation.

**Mission**

As a leader in professional nursing, outreach, and rural health, the FWWSO educates, conducts research and provides service and practice for the purpose of improving, protecting and promoting health.

**Accreditation and Membership**

The baccalaureate and graduate programs are accredited by the Commission on Collegiate Nursing Education (CCNE).

The baccalaureate program (Basic BSN, BRAND, and RN/BSN Completion) is approved by the Wyoming State Board of Nursing (WSBN). Graduates of the Basic BSN and BRAND options are qualified to apply for admission to the licensing examination offered by the board. Graduates of the DNP Program are eligible to take the national certification exam as a nurse practitioner.

**Physical Requirements**

All nursing students must be able to perform the essential functions of a student nurse. Reasonable accommodations will be afforded to student nurses with disabilities as required under the Americans with Disabilities Act of 1990. Faculty and staff from the FWWSO will work with staff from the University Disability Support Services office to determine what constitutes reasonable accommodation.

**Background Checks Requirement**

Students enrolled in clinical training programs within the College of Health Sciences are placed in educational and clinical settings where highly vulnerable clients such as minor children, individuals with disabilities, and/or the elderly, are routinely served. These clinical/practice training sites (including schools, hospitals, pharmacies, and other university sites) routinely require criminal background checks for all students who engage in clinical activities. Therefore, background checks shall be required on all applicants to programs in the College of Health Sciences prior to admission into their prospective program.

Students applying for admission into the nursing major component of the BSN Program, the MS Program and Certificate Program (post-master's), and the DNP Program will be notified by the FWWSO at the time of any admission offer the process for completing the required background check. Previous background checks (e.g. CNA Certification, LPN or RN Licensure) are not acceptable to fulfill this expectation. The results of the background check may determine final admittance to the program.

Students may also be required to update the criminal background check. Each clinical training site will be informed that students have passed a background check prior to placement at that site; some sites may require a more current background check. Clinical agencies may bar a student access to their facility for clinical experiences based on the results of the background check. If faculty and staff are not able to place the student in an alternative setting, the student will not be able to complete the program. In addition, students seeking readmission into the program are required to complete a new background check. Students are responsible for the costs associated with the admission background check and any other background checks that may be required.

## Drug Screening Requirements

Drug screening may be required by some clinical training sites. Students will be notified by the FWWSON should this be an expectation of them. Students may incur charges for this screening and will be notified of such at that time. Drug and/or alcohol testing for any student can be requested by the FWWSON.

## Cost of the Program

University fees, testing fees, and special supplies are paid for by nursing students. A variety of clinical facilities in and out of state are used in the application of knowledge. Responsibility for travel arrangements to the clinical areas rests with the student.

## Bachelor of Science in Nursing (BSN) Program

The Fay W. Whitney School of Nursing provides a curriculum based on the solid foundation of a general studies program. University students are individuals who come with learning preferences, different experiences, varied goals, and therefore, have unique learning needs. The primary responsibility of faculty is to empower students to become self-directed learners. Active learning is a teaching/learning partnership.

## Undergraduate Program Outcomes - BSN Program

1. Synthesize knowledge from the arts and sciences in the practice of professional nursing.
2. Demonstrate leadership by application of quality improvement processes in the provision of safe client care across the lifespan.
3. Demonstrate evidence-based practice in the care of clients, families, and communities.
4. Manage data, information, and technology to inform and guide nursing practice.
5. Engage in political and regulatory processes relevant to health care systems and the provision of safe care.
6. Collaborate with the interprofessional team in the delivery of evidence-based client-centered care.
7. Use health promotion, disease prevention, and risk reduction strategies in caring for clients, families, and communities.
8. Demonstrate behaviors that reflect the nursing code of ethics, professional and legal standards, and the values of nursing as a caring profession.

Graduates receive the Bachelor of Science in Nursing (BSN) degree, and upon successful completion of the licensure examination, are eligible to practice as registered nurses. Completion of the baccalaureate degree is a requirement for admission to graduate study leading to advanced nursing practice.

## Bachelor of Science in Nursing (BSN) Program Scholastic Requirements

University and College of Health Sciences policies governing scholastic requirements (e.g. major changes, probation and dismissal) apply to students enrolled in the School of Nursing. In addition to university/college requirements, the School of Nursing has the following scholastic requirements:

1. Grade of at least a C in all required courses, with one exception: Grade of B or better is required in CHEM 1000 (Introductory Chemistry).
2. Prerequisites must be met with C or better prior to entering each nursing course.
3. A cumulative Nursing G.P.A. (NGPA) of 2.75 (Basic BSN & BRAND) or 2.50 (RN/BSN) based on required courses is the minimum required for admission to the nursing major.
4. Students must attain a 2.00 (C) or S in each nursing course, as well as a cumulative Nursing G.P.A. (NGPA) of 2.75 (Basic BSN & BRAND) or 2.50 (RN/BSN) based on required courses to progress.
5. Single prerequisite, requisite, core, or nursing major course may not be repeated more than once.\*
6. Only a total of four prerequisite, requisite, or core courses may be repeated.\*
7. Only a total of two nursing courses in the major may be repeated.\*

*\*RN/BSN Course Repeat Policy: If a student chooses to repeat a course in which a grade of C or better was previously earned, it will not be counted as a repeat by the Fay W. Whitney School of Nursing.*

## Bachelor of Science in Nursing (BSN) Program Options

The Fay W. Whitney School of Nursing offers a baccalaureate program with three options to obtain the BSN degree:

1. Basic BSN – a four-year, on-campus BSN option for the student wishing to become a registered nurse at the baccalaureate level.

2. Bachelors Reach for Accelerated Nursing Degree (BRAND) – an accelerated BSN outreach option for the student who has already achieved a previous non-nursing baccalaureate degree and wishes to become a registered nurse at the baccalaureate level.

3. RN/BSN Completion – an online BSN completion option for the registered nurse who wishes to become a baccalaureate prepared nurse.

Please refer to the appropriate program option section that follows below.

## Basic BSN

This option is a four-year on-campus BSN program option for students who are interested in becoming a registered nurse.

Second baccalaureate degree seeking students have the choice of pursuing Basic BSN or BRAND (*see information under that heading*).

## Admission

Students who meet university requirements are admitted to the university. Graduates of fully accredited high schools may declare the pre-nursing component of the Basic BSN option (*declared PNRS major*) with a minimum math placement score of 3 or an ACT math score of 23. For students who do not meet these requirements, it is suggested that they major in general undeclared so that they will receive more appropriate advising for their situation through the Center for Advising and Career Services until they meet requirements. A general undeclared student will still be able to work toward becoming a pre-nursing major, but their progression through the pre-nursing curriculum may be delayed a minimum of one year until the student has successfully completed College Algebra, Biology, and Chemistry. Students seeking to transfer into the pre-nursing component must have a minimum nursing grade point average (NGPA) of 2.75 calculated on all prerequisite courses; however, this does not guarantee progression to the nursing major component. Further acceptance into the pre-nursing component of the Basic BSN option will also be based on evaluation of academic work with consideration of the School of Nursing BSN Program Scholastic Requirements.

Students typically apply for admission to the nursing major component in the spring of their sophomore year (*spring in which completing their final prerequisite courses*). Students applying for admission to the nursing major must be

certified as a nursing assistant (CNA). (*LPN licensure will also satisfy this requirement*). Verification of active certification/licensure is required by application deadline. An application without evidence of current CNA certification or LPN licensure will not be considered. The number of students admitted to the nursing major is limited. Admission is a competitive process and applicants meeting minimum requirements are not guaranteed admission to the major.

Criteria for admission to the nursing major component of the Basic BSN option as well as application instructions and deadlines can be found on the nursing website, <http://www.uwyo.edu/nursing> (*click on Programs; Basic BSN; Admission Criteria/Application to the Major*).

## Curriculum

The minimum requirement to graduate with a BSN is 120 semester hours of credit. Evaluation of transfer courses is required to determine credit eligibility.

The required courses, KIN/ZOO 3115 (Human Systems Physiology), PHCY 4450 (Pathophysiology), and PHCY 4470 (Pharmacology), must be upper division (3000/4000 level). Lower division/Community College level courses do not satisfy this requirement. Transfer courses must be reviewed for acceptability.

Nursing courses are offered fall and spring semesters of the university academic calendar. Students are required to have transportation to all clinical sites. A number of clinical sites are located in Cheyenne. The capstone practicum experience during spring of the senior year requires students to live in locations away from campus.

## Basic BSN Program of Study

(*Active CNA certification required for application/admission to Nursing Major Component; verification required by application deadline.*)

## Pre-Nursing Component

### Prerequisite Courses

(*Courses required for admission to the nursing major component.*)

	Hrs.
ENGL 1010 (COM1).....	3
Communication II (COM2).....	3
MATH 1400 (Q).....	3
STAT 2050 or 2070 (Q).....	4
LIFE 1010 (PN).....	4
CHEM 1000 or CHEM 1020 (PN).....	4

MICR/MOLB 2240.....	4
KIN/ZOO 2040.....	3
KIN/ZOO 2041.....	1
ZOO 3115.....	4
PHCY 4450.....	4
PSYC 1000 (H).....	3
FCSC 1140 or 1141.....	2-3
NURS 2340.....	3
<b>Total Hrs.</b>	<b>45-46</b>

### Graduation Courses

(*Recommend completing prior to admission to the nursing major component, but must be completed by graduation; exception is FYS course as noted below.*)

	Hrs.
First-Year Seminar (FYS) course.....	3
Human Culture (H) course.....	3
U.S. & Wyoming Constitutions (V) course.....	3
Free Elective course(s).....	3
<i>Note: Suggested course: NURS 2240 - Medical Terminology. Offered online in both fall and spring. Need 3 credits minimum; additional credits may be needed to meet minimum 120 credits for degree.</i>	
<b>Total Hrs.</b>	<b>12</b>

## Nursing Major Component

(*Nursing application and fee required*)

**NOTE:** *Once admitted to the nursing major component of the Basic BSN option, courses are taken in the semester sequence as reflected below. All courses must be passed with a C or better each semester in order to progress to the next semester's courses.*

JUNIOR YEAR: Fall		Hrs.
NURS 3125.....	3	3
NURS 3140.....	3	3
NURS 3440.....	3	3
NURS 3475.....	4	4
PHCY 4470.....	4	4
<b>Total Hrs.</b>	<b>17</b>	

JUNIOR YEAR: Spring		Hrs.
NURS 3020.....	3	3
NURS 3840.....	3	3
NURS 3842.....	3	3
NURS 3844.....	3	3
NURS 3875.....	4	4
<b>Total Hrs.</b>	<b>16</b>	

SENIOR YEAR: Fall		Hrs.
NURS 4125 (COM3).....	3	3
NURS 4440.....	4	4
NURS 4442.....	4	4
NURS 4475.....	4	4
<b>Total Hrs.</b>	<b>15</b>	

SENIOR YEAR: Spring		Hrs.
NURS 4250.....	3	3
NURS 4875.....	12	12
<b>Total Hrs.</b>	<b>15</b>	

## Nursing Major Component -

**Total Hrs.** 63

**Minimum Hours Required for the Degree** 120

(*Note: Course requirements/expectations are subject to change. Maintain contact with FWWSON for current expectations.*)

## BRAND

This option is for students who have a previous non-nursing baccalaureate degree, and who are seeking an accelerated option for obtaining the BSN.

Working with the Outreach School, nursing theory and supporting courses are offered using a combination of online courses, hybrid courses with periodic intensive on-campus experiences, and the Outreach School's technology. Clinical coursework is arranged at a Wyoming healthcare institution. This option is a 'summer to summer' format with a full-time schedule of courses.

## Admission

Students who meet university requirements are admitted to the university in the pre-nursing component of BRAND (*declared PNBR major*). The number of students admitted to BRAND is limited, and admission is a competitive process. Applicants meeting minimum requirements are not guaranteed admission.

Criteria for admission to BRAND as well as application instructions and deadlines can be found on the nursing website, <http://www.uwyo.edu/nursing> (*click on Programs; BRAND; Admission Criteria/Application*).

## Curriculum

The minimum requirement for the second bachelor's (SB) degree candidate to graduate with a BSN is 50 semester hours of credit. This curriculum option totals 58 credit hours.

The minimum requirement for an SB degree is 30 additional semester hours earned from UW, 12 of which must be in upper division level courses. If prior baccalaureate degree was earned through UW, the 30 credit minimum is in addition to the credits earned for previous degree. Evaluation of transfer courses is required to determine credit eligibility.

The required courses, PHCY 4450 (Pathophysiology) and PHCY 4470 (Pharmacology), must be upper division (3000/4000 level). Lower division/Community College level courses do not satisfy this requirement. Transfer courses must be reviewed for acceptability.

**BRAND Program of Study**  
**BRAND Pre-Nursing Component**  
**Prerequisite Courses**

*(Courses required for admission to the nursing major component.)*

	<b>Hrs.</b>
KIN/ZOO 2040 .....	3
KIN/ZOO 2041 .....	1
ZOO 3115 .....	4
PHCY 4450 .....	4
MICR/MOLB 2240 .....	5
PSYC 1000 .....	3
FCSC 1140 or 1141 .....	2-3
<b>Total Hrs.</b>	<b>22-23</b>

*(The first bachelor's degree will satisfy the UW USP general education requirements.)*

**Required Graduation Course**

	<b>Hrs.</b>
Approved US/WY Constitution course.....	3
<i>(Recommend completing prior to admission, but must be completed by graduation.)</i>	
<i>(Students who have completed an acceptable, transferable US Constitution course will only have to complete the remaining WY Constitution component as required by UW. The WY Constitution component may be satisfied through the 1 credit exam or course.)</i>	
<b>Total Hrs.</b>	<b>3</b>

**BRAND Nursing Major**  
**(58 credits)**

*(Nursing application and fee required.)*

**NOTE:** *Once admitted to BRAND courses are taken in the sequence as reflected below. All courses must be passed with a C or better each semester in order to progress to the next semester's courses.*

<b>SUMMER</b>	<b>Hrs.</b>
NURS 3710 .....	2
NURS 3730 .....	2
NURS 3750 .....	4
PHCY 4470 .....	4
<b>Total Hrs.</b>	<b>12</b>

<b>FALL</b>	<b>Hrs.</b>
NURS 3770 .....	6
NURS 3771 .....	6
NURS 3780 .....	4
<b>Total Hrs.</b>	<b>16</b>

<b>SPRING</b>	<b>Hrs.</b>
NURS 4710 .....	3
NURS 4735 .....	3
NURS 4736 .....	3
NURS 4740 .....	6
NURS 4741 .....	3
<b>Total Hrs.</b>	<b>18</b>

<b>SUMMER</b>	<b>Hrs.</b>
NURS 4775 .....	10
NURS 4785 .....	2
<b>Total Hrs.</b>	<b>12</b>

*(Note: Course requirements/expectations are subject to change. Maintain contact with FWWSON for current expectations.)*

**RN/BSN Completion**

This option is for the associate degree or diploma in nursing level registered nurse or the Wyoming associate degree nursing student who wishes to become a baccalaureate prepared nurse. Nursing theory courses are offered online. No on-campus time is required.

**Admission**

Students who meet university requirements are admitted to the university in the pre-nursing component of the RN/BSN Completion (declared PNBS major). Students are designated as pre-nursing until they have completed the RN/BSN application process and are formally admitted into the School of Nursing. Acceptance into the RN/BSN Completion is also based on evaluation of students' academic work with consideration of the School of Nursing BSN Program Scholastic Requirements.

The opportunity exists for students who are currently enrolled in a Wyoming associate degree nursing program to pursue dual admission to the RN/BSN Completion.

Students applying for admission to the nursing major component must have an active unencumbered RN license (current documentation must be on file with the School of Nursing throughout participation in the RN/BSN Completion). Verification of active unencumbered RN licensure is required by application deadline. Students currently enrolled in a Wyoming ADN program are required to provide a transcript noting current enrollment in the nursing program. The number of students admitted to RN/BSN Completion may be limited based on School of Nursing resources. Applicants meeting minimum requirements are not guaranteed admission to the major.

Criteria for admission to the nursing major component of the RN/BSN Completion as well as application instructions and deadlines can be found on the nursing website, <http://www.uwo.edu/nursing> (click on Programs; RN/BSN Completion; Admission Requirements/Application).

**Curriculum**

The minimum requirement to graduate with a BSN is 120 semester hours of credit. It is important for students to be aware of course prerequisites for individual nursing courses and to be in regular contact with a nursing adviser. Evaluation of transfer courses is required to determine credit eligibility.

The required course, ZOO 3115 (Human Systems Physiology) may be substituted with lower division/Community College level Human Physiology courses.

The required courses, PHCY 4450 (Pathophysiology) and PHCY 4470 (Pharmacology), must be upper division (3000/4000 level). Lower division/Community College level courses do not satisfy this requirement. Transfer courses must be reviewed for acceptability.

**RN/BSN Completion Program of Study**

*(Documentation of a current active unencumbered RN license must be on file with the School of Nursing throughout participation in the program)*

**Pre-Nursing Component**  
**Required USP Courses for Admission**

*(The following are USP degree requirements needed for formal FWWSON admission that may be met with transfer coursework. Grades of C or better are required.)*

MATH 1400 .....	3
Approved (COM1) Course.....	3
Approved (COM2) Course .....	3
<b>Total Hrs.</b>	<b>9</b>

**Required Prerequisite Courses for PHCY 4450**

*(In addition to KIN/ZOO 2040/2041 and ZOO 3115, the following courses are required prerequisites for taking PHCY 4450. They may be met with transfer coursework. Grades of C or better are required with one exception: grade of B or better is required in CHEM 1000.)*

LIFE 1010 (PN).....	4
CHEM 1000 or 1020 (PN).....	4
<b>Total Hrs.</b>	<b>8</b>

**Core Courses**

*(Students are encouraged to complete these courses before taking courses in the nursing major component.)*

	<b>Hrs.</b>
STAT 2050 or 2070 (Q).....	4
PSYC 1000 (H).....	3
KIN/ZOO 2040 .....	3
KIN/ZOO 2041 .....	1
ZOO 3115 .....	4
Approved MICR Course .....	4
PHCY 4450 (Online UW).....	4
PHCY 4470 (Online UW).....	4
NURS 3005 .....	1
NURS 3015.....	3
<b>Total Hrs.</b>	<b>31</b>

**Required USP Courses for Graduation**

(The following are additional USP degree requirements needed for graduation that may be met with transfer coursework.)

	<b>Hrs.</b>
First-Year Seminar (FYS).....	3
(met with 30+ transfer hours)	
Human Culture (H) .....	3
(in addition to PSYC 1000 (H), a second approved H course is required)	
Physical and Natural World (PN).....	6
(if not met by LIFE 1010 and CHEM 1000 or CHEM 1020)	
U.S. & Wyoming Constitutions (V).....	3
<b>Total Hrs.</b>	<b>15</b>

**Nursing Major Component (22 credits)**

(Students must be formally admitted to the nursing major component to take these courses.)

	<b>Hrs.</b>
NURS 3020.....	3
NURS 3045.....	3
NURS 3630.....	4
NURS 4055 (COM3).....	3
NURS 4145.....	3
NURS 4255.....	3
NURS 4985 .....	3
<b>Total Hrs.</b>	<b>22</b>

**Escrow Courses**

(Credits are automatically posted to the student's UW transcript based on completion of NURS 3630, documentation of RN licensure and transcript verifying graduation from an associate degree or diploma nursing program. These credits represent credit for nursing content learned in the associate degree or diploma in nursing program.)

	<b>Hrs.</b>
NURS 3440 .....	3
NURS 3475.....	4
NURS 3840.....	3
NURS 3842.....	3
NURS 3844.....	3
NURS 3875.....	4
NURS 4442.....	4
<b>Total Hrs.</b>	<b>24</b>

**Minimum Hours Required for the Degree****120**

(Residency Requirement: A minimum of 30 upper-division hours must be completed through UW.)

(Note: Course requirements/expectations are subject to change. Maintain contact with FWWSON for current expectations.)

**Graduate Study**

The Fay W. Whitney School of Nursing offers two graduate programs: leading to 1) a Master of Science (M.S.) degree and 2) a Doctor of Nursing Practice (D.N.P.) degree. The program option for the MS degree is Nurse Educator (NE). The program options for the DNP are Family Nurse Practitioner (FNP) and Family Psychiatric Mental Health Nurse Practitioner (PMH).

**Master of Science (MS) Program****Nurse Educator (NE)**

The Nurse Educator option prepares graduates to teach in undergraduate nursing education programs and in health care continuing education settings. The graduate meets the Wyoming State Board of Nursing's minimum educational requirements for teaching in a State of Wyoming approved nursing program.

**MS Program Outcomes**

The outcomes of the MS program are to:

1. Synthesize knowledge for the practice of evidence-based nursing and nursing education.
2. Effect change to improve health and health care in rural communities.

**Admission**

Complete application materials for the MS program must be received by the University of Wyoming no later than February 1 to be considered for fall admission. (The entire MS application process is completed online) The applicant is responsible to make certain that UW is in receipt of all application materials/fees. Applications completed after the specified deadline will be held and reviewed for the next admission consideration. The number of students admitted is limited. Admission is a competitive process and applicants meeting minimum requirements are not guaranteed admission to the program. Admission to the university does not guarantee admission to the M.S. program in the School of Nursing.

A bachelor of science in nursing degree is required for admission to the M.S. program. The bachelor's degree must be from an accredited - Council for Higher Education or equivalent - institution; the nursing degree must be from a CCNE or NLNAC accredited program. A current, active, unencumbered RN license in the state where the student plans to do their educational practicum is also required.

Criteria for admission as well as application instructions can be found on the nursing website, <http://www.uwyo.edu/nursing> (click on Programs; Master of Science-Nurse Educator-MS; Admission Criteria/Application).

All newly admitted students to the Nurse Educator program are required to come to campus for a fall orientation.

**Curriculum**

The graduate curriculum consists of five core courses which provide a foundation of advanced knowledge for rural nursing. In addition to the core courses, a group of nurse education specialty courses are required as identified in the program of study below. Students earning the MS degree will complete a capstone project which is integrated into the teaching practicum.

Students applying for the 2015-16 school year must complete the program of study by spring 2017. The Nurse Educator program will be discontinued in its current form and courses will not be offered after spring 2017.

**NE Program of Study**

(Total Credits: 36)

**Core Courses**

NURS 5010.....	3
NURS 5025.....	3
NURS 5027.....	3
NURS 5060.....	3
NURS 5505.....	3
<b>Total Hrs.</b>	<b>15</b>

**Educator Specialty Courses**

NURS 5280.....	3
NURS 5285.....	3
NURS 5290.....	3
NURS 5395.....	3
ADED 5050.....	3
ITEC 5160.....	3
<b>Total Hrs.</b>	<b>18</b>

**Electives (3 credit minimum)**

Select one 3-credit (minimum) 5000-level course which would supplement your need or interest (or meet your state's requirements). Courses in Adult Education & Technology are recommended.

(Note: Course requirements/expectations are subject to change. Maintain contact with FWWSON for current expectations.)

**Program Specific Graduate Assistantships**

Assistantships are available in the School of Nursing involving duties such as clinical teaching, online teaching, and/or research functions. Assistantships include tuition and

fee reductions for all or part of the tuition costs, and a monthly stipend. Incidental students fees are usually the student's responsibility. Student Health Insurance is part of the fee structure paid for by the department. Students should contact the department at the time of application to inquire about the availability of an assistantship. All assistantship applications should be received by April 1. Notification will be made by May 1.

### Doctor of Nursing Practice (DNP) Program

The DNP program is open to registered nurses with a minimum of a baccalaureate degree in nursing from a program nationally accredited by CCNE or NLNAC. The DNP program has two options: 1) Family Nurse Practitioner (FNP) and 2) Family Psychiatric Mental Health Nurse Practitioner (PMH).

### DNP Program Outcomes

1. The APN Clinical Scholar embraces EBP by promoting innovation through the integration of evidence, patient preferences, and clinician expertise.
2. The APN leader articulates a vision for health care with a self awareness that allows him/her to pursue this vision with humility, passion, and dedication.

### Admission

Complete application materials for the DNP Program must be received by the University of Wyoming no later than February 1 to be considered for fall admission. (*The entire DNP application process is completed online*) The applicant is responsible to make certain that UW is in receipt of all application materials/fees. Applications completed after the specified deadline will be held and reviewed for the next admission consideration. The number of students admitted is limited. Admission is a competitive process and applicants meeting minimum requirements are not guaranteed admission to the program. Admission to the university does not guarantee admission to the DNP program in the School of Nursing.

Criteria for admission as well as application instructions can be found on the nursing website, <http://www.uwyo.edu/nursing> (*click on Programs; DNP; Admission Criteria and Application*).

All new admits are required to come to campus for a Fall orientation. This expectation is applicable for all DNP options.

### Curriculum

Curricula for the PMH option is currently under development. Curricula for the FNP option is available on the nursing website, <http://www.uwyo.edu/nursing> (*click on Programs; DNP*). All DNP students, regardless of specialty option will take a set of core courses. In addition to the core courses a group of specialty courses are required for each NP option. Students earning the DNP degree will complete a final scholarly project which is integrated into the FNP and PMH curricula.

Working with the Outreach School, DNP core and clinical courses will be delivered using a combination of online courses; synchronous video web-conferencing, and hybrid courses with periodic intensive on-campus experiences. Clinical placements will be arranged at health care facilities in Wyoming, north central Colorado, or southern Montana.

### Family Nurse Practitioner (FNP)

The FNP option prepares advanced practice nurses to provide primary health care to diverse individuals and their families in a variety of outpatient settings, especially rural settings. Graduates are prepared to diagnose and treat common acute problems, such as infections and injuries, and common chronic illnesses, such as diabetes and hypertension. Graduates work in a variety of settings including independent nurse practitioner practices, physician offices, public health clinics, indigent clinics, emergency rooms, Indian Health Services, correctional facilities, and migrant clinics.

### Family Psychiatric Mental Health Nurse Practitioner (PMH)

The PMH option prepares advanced practice nurses to provide a full range of psychiatric care. Graduates are prepared to assess, diagnose, and manage, to include prescribing psychotropic medications, for people with chronic and acute psychiatric disorders. Graduates work in a variety of settings including inpatient and outpatient facilities such as hospitals; community-based or home care centers; local, state, and federal mental health agencies; long-term care facilities; private practices; substance abuse and detoxification programs; emergency psychiatric service centers; primary care offices; correctional facilities, home health agencies; and behavioral health care companies.

### Nursing (NURS)

Courses listed below, with the exception of NURS 2110, 2135, 2240, 2340, 3250, 4155, 4175, 4350, 4960, and 4980 are open only to students formally admitted into the nursing major component of the BSN Program as required of their specific option. NURS 1000 is open to students who are majoring in nursing.

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).**

**1000. Introduction to the Intellectual Community in Nursing. 1. [I,L◀▶(none)]** Introduces first-year students to the intellectual expectations of the university, promotes successful transition to higher education, and explores issues in professional nursing. Designed to introduce and reaffirm skills for academic success including critical thinking, information literacy, and the concept of "life-long learner" within the context of professional nursing. (Normally offered fall semester)

**1010. Reflections on Professional Nursing. 1.** Introduction to various aspects of the profession of nursing with the opportunity to gain personal insight into a future nursing career. *Prerequisite:* Enrolled in Nursing FIG.

**1101. First-Year Seminar. 3. [(none)◀▶FYS]**  
**2110. Fundamentals of Aging and Human Development. 3.** Discusses aging as lifelong process, involving interrelationships of the individual and his or her environment. Includes future demographic trends, family health care, social policy and mass media. (Normally offered fall semester)

**2135. Women and Aging. 3.** Focuses on women and the aging process with emphasis given to both the problems and promises of aging. Topics to be explored within a multicultural, sociological framework include the definition of self, relationships, community, health and health care, work and service, retirement, economic realities and new perspectives on aging. Cross listed with WMST 2135. *Prerequisites:* ENGL/SOC/WMST 1080 or SOC 1000 or FCSC/NURS 2110 or SOC 2120.

**2240. Medical Terminology. 3.** Introduces medical terminology. Includes word structure of medical-surgical terms, body parts and organs, body systems and commonly used medical abbreviations.

**2340. Developmental Influences on Health. 3.** Explores interaction between development and health. Discusses human development of physiological, psychological, cognitive, sociocultural, and spiritual systems across the lifespan. Identifies selected theories associated development over the lifespan and implications



for health care. Provides foundation for more in-depth consideration of developmental factors related to health maintenance and human potential.

**3005. Scholarly Approaches to Online Learning. 1.** Prepares the student with the foundations of learning in an on-line format. Includes APA format, writing scholarly papers, and library skills. *Prerequisites:* Current RN license or concurrent enrollment in WY ADN education program or graduate of WY ADN education program.

**3015. Introduction to Baccalaureate Nursing. 3.** Introduces the role of a professional nurse with a baccalaureate degree. Conceptual foundations including nursing theories, health-care systems, application of evidence-based practice, informatics and the components of safety, quality and leadership in nursing practice are presented. Students are prepared to move on to additional nursing coursework.

*Prerequisites:* Current RN license or concurrent enrollment in WY ADN education program or graduate of WY ADN education program; NURS 3005 or concurrent enrollment.

**3020. Cultural Diversity in Family Health Care. 3. [D◀(none)]** Concepts of cultural heritage, history, diversity, health, illness, and family theories are applied to nursing assessment and care of the family as client. Contemporary issues of immigration and poverty, the effect of culture, social class, religion/spirituality, family form, family development stage and situational factors on family as client are studied. *Prerequisites:* admission into the nursing major component of the program; RN/BSN: NURS 3015 or concurrent enrollment. (Normally offered spring semester)

**3045. Health Assessment for the RN. 3.** Assessment of the physiological, psychosocial and sociocultural variables of the individual across the lifespan. History taking, advanced physical exam techniques and appropriate documentation of findings assist the student in identifying normal variations, potential problems of human health experiences and health promotion opportunities. *Prerequisite:* admission to nursing major component of the program; NURS 3015 or concurrent enrollment.

**3125. Professional Nursing. 3.** Introduction of core concepts, theory and processes essential to professional nursing. Roles and scope of practice of the professional nurse, principles of therapeutic communication, patient safety, nursing theory and process, and evidence based practice will be emphasized. *Prerequisite:* admission to the nursing major component of the program.

**3140. Health Assessment. 3.** Students learn to assess the physiological, psychological, sociocultural and developmental variables of individual client systems across the lifespan. Normal variations and potential problems of human health experiences are identified. Documentation skills are developed. *Prerequisite:* admission to the nursing major component of the program.

**3250. Health Psychology. 3.** Provides overview of growing partnership between psychology and health care, including history of psychology in health care; theoretical foundations of health and illness; intervention and research techniques; stress and high risk behaviors (e.g., substance abuse, eating behaviors, AIDS); psychology's contribution to improving outcomes and quality of life in chronic and life-threatening behaviors. Cross listed with PSYC 3250. *Prerequisite:* PSYC 1000 or consent of instructor.

**3440. Adult Health I. 3.** Develop clinical judgment skills by using a consistent process in identifying relevant client data, responding to that data appropriately, planning care and evaluating that care. This process will be accompanied by exploring a wide range of nursing concepts essential in caring for the adult client, through the use of case studies, interactive and/or group active learning. *Prerequisites:* admission into the nursing major component of the program; NURS 3140, 3125, PHCY 4470 or concurrent enrollment.

**3475. Nursing Practicum: Adult Health I. 4.** Students provide basic nursing care using the nursing process in a clinical setting with adult clients experiencing alterations in health status. The focus is on the physiological, psychological, spiritual, developmental and sociocultural dimensions of the client. The students will identify the roles of the professional nurse. *Prerequisites:* NURS 3440 or concurrent enrollment.

**3630. Health Promotion. 4. [P◀(none)]** Learn health promotion concepts and theories, identify at risk behaviors, and design nursing interventions to promote health and prevent illness. The teaching role of the nurse is emphasized for individual and group clients across the lifespan. Students strive to effect positive changes to their own personal health and fitness. *Prerequisites:* admission into the nursing major component of the program, NURS 3015, 3020, and 3045 or concurrent enrollment.

**3710. Nursing Fundamentals and Laboratory. 2.** Includes concepts of basic care/comfort, technical skills, medical equipment, asepsis, medication administration, nurse/client safety, and client rights. Increased confidence

and competency in critical thinking, communication skills, and the performance of motor skills. *Prerequisites:* previous bachelor's degree; admission to the BRAND track; concurrent enrollment in NURS 3750 and NURS 3730.

**3715. Foundational Laboratory. 2.** Using system analysis, students assess all dimensions of individual clients across life span. Concepts and demonstration of basic care/comfort; technical skills; use of equipment; asepsis/infection control; medication administration; nurse/client safety; client rights and dignity. Allows the student to gain confidence and competency in performing motor skills; critical thinking; communication; self-development. *Prerequisites:* previous Bachelor's degree; admission to BRAND; concurrent enrollment in NURS 3710; NURS 3750.

**3730. Introduction to Professional Nursing. 2.** Introduces students to the core concepts of professional nursing practice. Nursing process, domains of nursing practice, health policy, evidence-based practice, legal and professional standards will be assimilated into nursing practice from discussion, role playing and case studies. Contemporary nursing issues and situational factors will be examined. *Prerequisites:* previous Bachelor's degree; admitted to the BRAND nursing track.

**3750. Health Assessment and Promotion. 4.** Using system analysis, students assess the physiological, psychological, spiritual, sociocultural, developmental variables of individual clients across the life span. Nursing process and evidence-based nursing practice are used to promote/protect health of clients through health promotion, risk reduction, disease prevention of the client/client systems. Process skills and professional roles are integrated. *Prerequisites:* previous bachelor's degree; admitted to BRAND program; concurrent enrollment in NURS 3710.

**3770. Nursing Care in Acute and Chronic Illness. 6.** Discern critical elements of professional nursing medical-surgical concepts for adults experiencing acute/chronic health alterations progressing to complex health alterations. Focuses on patient safety principles; quality initiatives; evidence-based nursing; information technology; interprofessional collaboration, communication; health promotion strategies; and critical thinking in the planning of client centered nursing care for the adult. *Prerequisites:* NURS 3750; NURS 3730; NURS 3710; PHCY 4470.

**3771. Nursing Care in Acute and Chronic Illness Practicum. 6.** Application of critical elements of professional nursing practice with adults experiencing acute and chronic health alterations. Focus is on incorporation

of patient safety principles; quality initiatives; evidence-based nursing practice; information technology; interprofessional collaboration and communication; health promotion strategies; and critical thinking and clinical reasoning in the provision of nursing care. *Prerequisites:* concurrent enrollment in NURS 3770.

**3780. Evidence-Based Practice in Nursing. 4.** Prepares nursing students to engage in evidence-based practice in nursing, specifically how to search the literature and databases, ask meaningful clinical questions, find relevant evidence, critically appraise evidence, integrate best evidence with clinical expertise and patient/community values. *Prerequisites:* admission to the BRAND program, concurrent enrollment in NURS 3770.

**3840. Adult Health II. 3.** Progress from novice to beginner in developing critical judgment skills by applying nursing concepts and evaluating concepts on the adult client with illness. Analyze and synthesize data, develop plans of care, implement care and re-evaluate that care when necessary, through the use of case studies, interactive and/or group active learning. *Prerequisites:* NURS 3440 and 3475; NURS 3020 or concurrent enrollment.

**3842. Care of the Older Adult. 3.** Explores the physiological, psychological, spiritual, developmental and socio-cultural dimensions of the older adult and addresses the 30 AACN/Hartford Foundations' Recommended Baccalaureate Competencies and Curricular Guidelines for Geriatric Nursing Care. *Prerequisites:* NURS 3440 and 3475; NURS 3020 or concurrent enrollment.

**3844. Mental Health and Illness. 3.** Explores psychiatric illnesses and mental health concepts consistent with the roles of the professional nurse. Emphasis is on the nursing process, DSM-IV criteria, therapeutic communication, treatment modalities, legal and ethical concerns, community resources, and inter-related client needs in a variety of health care settings. *Prerequisites:* NURS 3440 and 3475; NURS 3020 or concurrent enrollment.

**3875. Nursing Practicum: Adult Health II. 4.** Junior nursing students are placed in clinical settings to provide patient-centered nursing care using the nursing process. The focus is on adult clients experiencing acute, chronic and/or psychiatric alterations in health. The physiological, psychological, spiritual, developmental and socio-cultural client dimensions are studied and professional nursing roles are integrated into practice. *Prerequisites:* NURS 3840, 3842, 3844 or concurrent enrollment.

**3970. Nursing Externship. 3.** Allows students to obtain college credit for nursing experience gained in an approved setting. Increases

application of nursing theory, knowledge of a health care agency, interpersonal working relationships, technical skills and organization of time in providing nursing care. Offered S/U only. *Prerequisites:* NURS 3840, 3842, 3844, and 3875. (Offered once a year in summer)

**4055. Evidence-Based Nursing Practice for the RN. 3. [L◀COM3]** Prepares RN students to engage in evidence-based nursing, specifically how to ask meaningful clinical questions, find relevant evidence, critically appraise evidence, and integrate best evidence with clinical expertise and patient/community values. *Prerequisites:* QA; STAT 2050 or 2070 or equivalent; admission into the nursing major component of the program; NURS 3630 or concurrent enrollment.

**4125. Evidence-Based Nursing. 3. [L,WC▶(none)]** Prepares students to engage in evidence-based nursing, specifically how to ask meaningful clinical questions, find relevant evidence, critically appraise evidence, and integrate best evidence with clinical expertise and patient/community values. *Prerequisites:* WA and WB; STAT 2050 or 2070 or equivalent; admission into the nursing major component of the program.

**4145. Public/Community Health Nursing. 3.** Students are introduced to public health nursing, the core functions and essential services of public health, and community health nursing competencies. Includes population-focused nursing, epidemiology, community assessment, and the application of the nursing process to the community as client. Students assess their communities and research health problems. *Prerequisites:* admission into the nursing major component of the program; NURS 3630 or concurrent enrollment.

**4155 [4920, 4950]. Women, War and Health. 3. [CS,G▶(none)]** Focuses on the physical and psychological health of women and children as influenced by armed conflict. Examines the psychosocial, public health, and socioeconomic effects of living in contemporary war zones or conditions of threatened war. Key international documents that address effects upon women and children are discussed in order to evaluate feminist initiatives to prevent and mediate the consequences of war. Cross listed with INST/WMST 4155. (Offered every other year)

**4175 [4940]. Gender, Women, and Health. 3. [CS,G▶(none)]** Focuses on issues of gender, women and health, including the effects of gender bias in medical research and health care practices and policies. Health care issues of specific concern to women, both nationally and internationally will be examined. Dual

listed with NURS 5175. Cross listed with INST/WMST 4175. *Prerequisite:* upper-division standing, lower division social or psychological science course. (Offered every other year)

**4250. Leadership in Nursing. 3.** The role of leader in nursing practice is developed through the integration of leadership, management, and organizational theories. Emphasis is placed on the nurse as health care provider and manager of care facilitating planned change in clients and/or environments. *Prerequisites:* NURS 4475; concurrent enrollment with NURS 4875.

**4255. Nursing Leadership. 3. [WC▶(none)]** Students study the concepts and theories of leadership, management, and organizations. Emphasis is placed on the nurse as health care provider and the development of leading, managing, decision-making, problem-solving, and writing in nursing skills. Course content includes controlling the profession, legal and ethical aspects, informatics, and professional development. *Prerequisites:* WA and WB; admission into the nursing major component of the program; NURS 3630 or concurrent enrollment.

**4350. Health Management Issues in Early Education. 3.** Provides the student the opportunity to examine the implications of a child's health status on his/her personal, educational, social and cognitive development. Provides personnel working closely with the young child with disabilities and his/her family an understanding of the issues related to health concerns and a framework for intervention planning. Special emphasis is placed on concerns specific to the child in a day care, preschool or other school setting. Cross listed with EDEC 4350. *Prerequisites:* junior standing and consent of instructor.

**4440. Public Health Nursing. 4.** Introduces the student to population-focused nursing and applies the nursing process to the community as client. Addresses core functions and essential services of public health. Focuses on epidemiology, community assessment, community planning and implementation, analysis of the health care system, emergency preparedness, and legal aspects of public health. *Prerequisites:* NURS 3875; NURS 4125 or concurrent enrollment.

**4442. Nursing Care of Children and Families. 4.** Theory course which encompasses the care of children and childbearing families including the physiological, psychological, spiritual, developmental and socio-cultural dimensions. The focus of this class is on obstetrical and pediatric nursing care. Integrates wellness and illness issues in all aspects of family care. *Prerequisites:* NURS 3875; NURS 4125 or concurrent enrollment.

**4475. Nursing Practicum: Family and Public Health. 4.** In this senior clinical practicum, students apply the nursing process to childbearing families, children and communities. The focus is on the physiological, psychological, spiritual, developmental and socio-cultural dimensions of individuals, families and populations. Students will incorporate professional nursing roles into population centered care. *Prerequisites:* NURS 4440, 4442 or concurrent enrollment.

**4710. Nursing Care of the Aging Family. 3.** Utilizes nursing process to assess, promote, and protect health of aging families. Focus is on physiological, psychological, spiritual, developmental, socio-cultural dimensions of the geriatric adult, including family dynamics. Evidence-based practice guides illness and disease management; disease prevention. Expected, unexpected responses to therapies; grief, loss, end of life concepts will be incorporated. *Prerequisites:* senior standing; consent of instructor.

**4735. Nursing Care of Vulnerable Populations. 3.** Synthesizes past learning and cultivates independent nursing practice for vulnerable populations in acute/ community settings. Focuses on the vulnerability associated with mental health, psychiatric illnesses. Core public health functions of community assessment, essential health services, disaster preparedness, health policy development/global health care are also emphasized to plan population-based nursing interventions. *Prerequisites:* NURS 3770 and 3780; concurrent enrollment in NURS 4736.

**4736. Nursing Care of Vulnerable Populations Practicum. 3.** Applies past learning and cultivates evidence-based nursing practice for vulnerable populations in acute/ community settings. Focuses on the vulnerability associated with mental health, psychiatric illnesses. Core public health functions of community assessment, essential health services, disaster preparedness, health policy development/global health care are also emphasized to implement population-based nursing interventions. *Prerequisites:* NURS 3770; concurrent enrollment in NURS 4735.

**4740. Nursing Care of the Young Family. 6.** Utilizes nursing process to assess, promote, and protect the health of young families as client. Focus is human sexuality and reproduction, family planning, pregnancy stages, neonatal, pediatrics. Growth and development, health promotion, disease prevention, family dynamics are included. Evidence-based nursing guides practice to promote a healthy

family and family system. *Prerequisites:* NURS 3770; 3771, and concurrent enrollment in NURS 4741.

**4741. Nursing Care of the Young Family Practicum. 3.** Applies and synthesizes nursing process to assess, promote, and protect the health of young families as clients. Focus is human sexuality and reproduction, family planning, pregnancy stages, neonatal, pediatrics. Growth and development, health promotion, disease prevention, family dynamics are included. Evidence-based nursing guides practice to promote a health family/family system. Offered S/U only. *Prerequisites:* NURS 3770 and 3780; and concurrent enrollment in NURS 4740.

**4750. Independent Study in Nursing. 1-4 (Max. 6).** Provides students with opportunity to investigate a problem in nursing care not considered in required nursing courses or to explore in more depth an area considered in one of required nursing courses. Area of study and requirements for earning credit are determined in consultation with nursing faculty member. *Prerequisite:* senior standing in nursing or consent of instructor. Offered S/U only. (Normally offered fall, spring and summer)

**4775. Nursing Senior Capstone. 10.** Provides opportunities to utilize and synthesize core concepts of professional nursing. Intensive clinical experience allowing students to become socialized into health care delivery system; gain in autonomy/confidence in performing skills; practice critical thinking and clinical reasoning in making ethical clinical decisions; develop leadership in providing and coordinating evidence-based nursing care. Offered S/U only. *Prerequisites:* NURS 4710; NURS 4735; NURS 4736; and concurrent enrollment in NURS 4785.

**4785. Nursing Integration. 2.** Focuses on the continuing integration of previously learned concepts. The student further develops the role of consumer of research and incorporates leadership and management skills as a member of the profession. *Prerequisites:* NURS 4735; NURS 4736; NURS 4710; and concurrent enrollment in NURS 4775.

**4790. Special Topics in Nursing. 1-3 (Max. 8).** Provides offerings in selected nursing topics on concepts, theories or practices as related to specified areas in nursing. *Prerequisites:* junior standing in nursing and consent of instructor.

**4792. Cultural and International Health Care Immersion. 3.** An in-depth examination of cultural influences on health care systems, which will include both classroom and in-field immersion experiences. *Prerequisites:* senior or graduate standing in student's major and instructor permission.

**4875. Capstone Practicum. 12.** A precepted capstone clinical course that assists students in synthesizing basic concepts of professional nursing. Learning experiences allow students to gain confidence, practice clinical reasoning and leadership skills, communicate effectively with the interprofessional team, apply ethical decision making skills and develop evidence-based practice. *Prerequisite:* all required courses in the nursing major. (Normally offered spring semester)

**4960. Women's Bodies, Women's Minds. 3. [CS♦(none)]** Explores women's physiologic and psychologic development and the influences of patriarchal society upon the interpretation of what constitutes normalcy across the female life cycle. Analyzes historical, cultural and contemporary attitudes of the health care system and women's perspectives on menstruation, childbearing, breast-feeding and menopause. Cross listed with WMST 4960. (Normally offered spring semester)

**4980. Nursing Ethics. 3.** Acquaints the undergraduate or graduate nursing student with basic bioethical theory and issues that arise throughout the human lifespan. Includes use of community and professional resources to facilitate decision making where bioethical issues are encountered in nursing practice. *Prerequisites:* senior nursing student or RN; e-mail access with beginning computer skills; library research skills.

**4985. RN/BSN Capstone Project. 3.** Synthesizes program concepts through analysis of a documented public health issue. Students will use evidence based resources, address public health competencies and analyze how the identified issue and interventions impact the health of the affected population. *Prerequisites:* Admission into the nursing major component of the program; all required courses in the nursing major; NURS 4255 or concurrent enrollment, current RN license.

**5005. Pediatric Assessment. 3.** Online course builds upon basic nursing assessment skills. Includes advanced pediatric assessment techniques as well as family interviewing techniques that lead to clinical decision-making. *Prerequisites:* admission to Early Childhood Interdisciplinary Nursing Program; RN License.

**5010. Health and Health Care in Rural Cultures. 3.** Examines the patterns and health care of people of rural cultures for the purpose of adapting knowledge and health care models to the rural life-style and needs. Special attention is focused on development of culturally congruent self-care and professional primary

care methods and on appropriate nursing roles. *Prerequisite:* admitted to UW's graduate nursing program; or consent of instructor (required form on nursing web page).

**5025. Application of Theory in Advanced Nursing Practice. 3.** Emphasizes critical analysis of theory and the use of theory as a base for nursing practice. Theory analysis and evaluation are used to develop theory-based practice and the interrelationships among theory, research and practice in the development of nursing knowledge are examined. *Prerequisite:* admitted to UW's graduate nursing program or consent of instructor (required form on nursing web page).

**5027. Evidence-based Nursing Practice. 3.** Critically analyzes the literature supporting the knowledge and implementation of evidence in health care and educational settings. Examines and critiques both quantitative and qualitative methods and their applicability to clinical problems. *Prerequisites:* Admitted to UW's graduate nursing program; NURS 5025; undergraduate statistics course.

**5060. Epidemiology In Rural Health Care. 3.** Presents the basic principles of epidemiology. Includes an overview of the purposes and methods of epidemiology including selected biostatistics. Consideration is given to sources of epidemiological data and epidemiological strategies. Special consideration is given to the epidemiology of rural health. *Prerequisite:* baccalaureate degree.

**5105. Child Care Health Consultation. 3.** Topics include consultation skills, children's mental health, child care health and safety, child abuse and neglect, nutrition, injury prevention, oral health, caring for ill children in child care settings, working with children with special needs, issues of diversity, model child care health policies, and injury prevention. Cross listed with FCSC 5105. *Prerequisite:* graduate standing.

**5115. Interdisciplinary Early Childhood Seminar. 3.** Advanced professional course for students interested in current trends and issues in early childhood development. Interdisciplinary in nature, drawing from research in communication disorders, kinesiology and health, elementary and early childhood education and special education, child and family studies, nursing and psychology. Cross listed with EDEC, FCSC, PSYC, HLED, SPPA 5115. *Prerequisite:* graduate standing.

**5140. Pharmacotherapy for Primary Care Practitioners. 4.** Prepares primary care practitioners in drug therapy management for a variety of client populations with an emphasis

on rural practice. Cross listed with PHCY 5140. *Prerequisite:* admission into NP program; NURS 5165; or consent of NP program coordinator.

**5155. Women, War & Health. 3.** Focuses on the physical and psychological health of women and children as influenced by armed conflict. Examines the psychosocial, public health, and socioeconomic effects of living in contemporary war zones or conditions of threatened war. Key international documents that address effects upon women and children are discussed in order to evaluate feminist initiatives to prevent and mediate the consequences of war. Dual listed with NURS 4155; cross listed with WMST/INST 5155. *Prerequisites:* upper-division standing, lower division social or psychological science course and consent of instructor.

**5160. Parent/Child Policy Development and Health Promotion. 3.** Focuses on the advanced practice nursing role of the prevention specialist in parent child health promotion with implications for rural community health policy development. *Prerequisite:* baccalaureate degree.

**5165. Advanced Pathophysiology for Primary Care Practitioners. 4.** A system-based approach is used to explore selected pathophysiological states encountered across the lifespan in primary care. The developmental physiology, etiology, pathogenesis, clinical manifestations, and physiological responses to illness and treatment regimens are examined, providing a basis for the foundation of clinical decisions. *Prerequisites:* PHCY 4450 or equivalent.

**5175. Gender, Women & Health. 3.** Focuses on issues of gender, women and health, including the effects of gender bias in medical research and health care practices and policies. Health care issues of specific concern to women, both nationally and internationally are examined. Dual listed with NURS 4175; cross listed with WMST/INST 5175. *Prerequisites:* upper-division standing, lower division social or psychological science course.

**5265. Human Cadaver Seminar. 1.** Instructor- and learner-led discussions with hands-on cadaver experience. Seminar will explore human anatomy in relation to physiology and pathophysiology *Prerequisite:* Admission to DNP program.

**5280. Introduction to Nursing Education. 3.** Introduction to the nurse faculty role in higher education. Historical perspectives of nursing education, current challenges and legal and ethical implications are discussed. Introduction to assessment and evaluation in higher education. *Prerequisite:* concurrent enrollment in NURS 5025.

**5285. Teaching Methodologies and Evaluation. 3.** Evidence-based teaching methodologies appropriate in both clinical and didactic courses. Development of evaluation strategies to assess student learning. *Prerequisite:* NURS 5280.

**5290. Curriculum in Nursing Education. 3.** Emphasis is on the process of developing curricula in a nursing education setting or healthcare setting to include assessment and evaluation of program outcomes. *Prerequisite:* NURS 5285.

**5395. Practicum in Nursing Education. 3.** Clinical practicum demonstrating application of the roles and responsibilities of a nurse educator in an appropriate setting with a preceptor. Satisfactory/Unsatisfactory only. *Prerequisite:* NURS 5290.

**5505. Rural Nursing Leadership. 3.** Examines rural nursing leadership in effecting health care system improvements through the analysis and evaluation of policy and economic, legal and ethical issues. *Prerequisites:* Completion of all required nursing major courses except for NURS 5395.

**5590. Preparation for Non-Thesis Clinical Scholarship Option. 1.** Facilitates students in completing the preliminary work of topic identification that is necessary to move through the Non-Thesis clinical Scholarship Option (NURS 5600). It provides the opportunity to identify and select a professional nursing problem of interest and to develop a prospectus for a clinical scholarship paper. *Prerequisites:* NURS 5010, NURS 5025, NURS 5026, and at least two of the specialty courses within the MS program completed. Students are encouraged to take this course the semester immediately preceding enrollment in NURS 5600.

**5600. Non-Thesis Portfolio Seminar. 1-4 (Max. 4).** Designed to facilitate documentation of the outcomes of the masters program. In an interactive forum, students apply previously learned research, theory and practice skills to the rural advanced practice nursing role. Each student will develop a portfolio to document attainment of program outcomes. *Prerequisite:* NURS 5010, 5025, and 5026; specialty courses within the MS program completed or concurrent enrollment.

**5650. Non-Thesis Clinical Project. 1-4 (Max. 98).** A non-thesis project involving independent student work focusing on developing, implementing and evaluating a clinical nursing project. The course content is adapted to meet the specific focus of the student. A report must be written under the direction of a member of the graduate faculty in the School of Nursing. A non-thesis committee is composed of the chair, as director, one faculty

member from the School of Nursing, and a member of the graduate faculty from another discipline. *Prerequisites:* completion of NURS 5010, 5025 5026 and the majority of support courses or concurrent.

**5750. Independent Advanced Study. 1-4 (Max. 8).** Provides students the opportunity to analyze a problem in nursing; apply theory to clients in a clinical setting; or pursue an area of interest under the guidance of a faculty member. Requirements and evaluation are mutually established between the student and faculty member. Offered as satisfactory/unsatisfactory only.

**5790. Advanced Issues in Health. 1-3 (Max. 12).** Designed to provide graduate students the opportunity of pursuing advanced issues in health. *Prerequisite:* graduate status.

**5800. Foundations of Integrative Advanced Practice Nursing. 3.** An introduction to the core concepts and roles of advanced practice nursing, particularly the doctorally-prepared nurse practitioner. Special emphasis is given to 1) the integration of nursing and other health-related theories and models in rural nurse practitioner-delivered care and 2) professional writing in advanced practice nursing. *Prerequisite:* admission to the DNP program.

**5805. Evidence-based Practice for Advanced Practice Nursing I. 3.** Overview of the evidence-based practice model, including the contributions of research, patient preferences, and clinician expertise, and the theoretical frameworks that inform this expertise. Evaluating typical research designs for advanced practice nursing. *Prerequisite:* admission to the DNP program.

**5810. Health Behavior Change I: Foundations. 3.** Foundations of health behavior as related to individual and community systems. Special emphasis will be given to the unique aspects of rural populations. Principles of learning, theories of health behavior change, and their application to advanced nursing practice. Includes skill building for advanced Health Behavior Change courses. *Prerequisite:* admission to the DNP program.

**5815. Evidence-based Practice for Advanced Practice Nursing II. 3.** Students learn to develop an evaluation of clinical practice based upon critical appraisal of the existing research evidence, clinician expertise, and patient preferences. Special emphasis is placed on methods that an advanced practice nurse might use to generate and disseminate evidence from clinical practice. *Prerequisite:* NURS 5805.

**5820. Health Behavior Change II: Primary Prevention and Wellness. 3.** Application of theories and techniques of health behavior change and epidemiology to issues of primary prevention from the individual to the community. Development of programs for primary prevention in advanced practice nursing, including assessments, intervention development and evaluation. Examples of health issues include lifestyle interventions, stress management, substance abuse prevention. *Prerequisites:* NURS 5805 and 5810.

**5825. Advanced Health Assessment and Clinical Decision-Making. 5.** Builds upon basic nursing assessment skills; includes advanced assessment techniques and diagnostic reasoning that lead to clinical decision-making for nurse practitioners. *Prerequisite:* Admission to DNP program.

**5830. Health Behavior Change III: Secondary and Tertiary Prevention. 3.** Focuses on building NPs' skills for changing a patient's behavior, thoughts, and feelings with a focus on secondary and tertiary prevention. The goal is for students to become sufficiently skilled in general and specific health behavior change techniques so that they can incorporate these into a holistic health care practice. *Prerequisites:* NURS 5805 and 5810.

**5840. Leadership in Advanced Practice Nursing. 3.** Organizational and systems leadership for improvement of health. Focuses on interrelationship among systems, ethics, policy, and change. Identifies qualities and behaviors associated with exemplary nursing leadership. Special emphasis is given to rural health care systems. *Prerequisite:* passing DNP Program Preliminary Exam.

**5845. Health Communication/Informatics. 3.** Emphasizes understanding, managing and using of information systems/technology to provide healthcare in rural health settings. Discussion includes the evaluation and project management of the human/technology interface with specific attention to business, ethical and legal issues encountered in interdisciplinary, collaborative settings. *Prerequisite:* passing DNP Program Preliminary Exam.

**5850. Innovative Practice Models. 4.** Examination of innovative health care models and their incorporation into primary care. Emphasizes the evaluation models in care delivery, quality management, and business improvement strategies. *Prerequisite:* Admission to DNP program.

**5861. Practicum: Therapeutic Interventions Across the Lifespan. 3.** Clinical practicum focused on beginning level therapeutic

competencies in the advanced practice role of the FPMHNP. *Prerequisites:* Admission to the Doctor of Nursing Practice (DNP) Family Psychiatric Mental Health Nurse Practitioner (FPMHNP) program and successful completion of both NURS 5825 and NURS 5140.

**5865. Doctor of Nursing, Practice Seminar. 1 (Max. 6).** Instructor and student-led discussions designed to facilitate role transition of the doctorally-prepared nurse practitioner. Seminars include topics related to integration and application of nursing and other health-related theories and models in rural nurse practitioner-delivered care. Topics will vary by year and semester as students' progress through the DNP program. *Prerequisites:* admission to the DNP program and progression through DNP plan of study.

**5871. Wellness for Adults in Primary Care. 3.** Provision of wellness primary care for adults across the lifespan, including primary and secondary prevention. *Prerequisite:* Admission to DNP program.

**5872. Practicum for Wellness in Primary Care. 3.** Clinical practicum for N5871, Wellness for Adults in Primary Care. *Prerequisite:* Admission to DNP program.

**5873. Primary Care for Children, Adolescents, and Families. 3.** Provision of primary care for children, adolescents, and families across the lifespan, including primary and secondary prevention. *Prerequisite:* Admission to DNP program.

**5874. Practicum for Primary Care for Children, Adolescents, and Families. 3.** Clinical practicum for N5873, Primary Care for Children, Adolescents, and Families. *Prerequisite:* Admission to DNP program.

**5875. Primary Care for Acute & Chronically Ill Adults. 3.** Diagnosis and management of select acute and chronic illnesses experienced by adults across the lifespan. Primary focus is on those physical and behavioral illnesses with high prevalence in rural primary care. *Prerequisite:* Admission to DNP program.

**5876. Practicum for Primary Care for Acute & Chronically Ill Adults. 3.** Clinical practicum for N5875, Primary Care for Acute & Chronically Ill Adults I. *Prerequisite:* Admission to DNP program.

**5877. Primary Care for Acute & Chronically Ill Adults II. 3.** Continuation of N5875. Diagnosis and management of select acute and chronic illnesses experienced by adults across the lifespan. Primary focus is on those physical and behavioral illnesses with high prevalence in rural primary care. *Prerequisite:* Admission to DNP program.

**5878. Practicum for Primary Care for Acute & Chronically Ill Adults II. 3.** Clinical practicum for N5877, Primary Care for Acute & Chronically Ill Adults II. *Prerequisite:* Admission to DNP program.

**5891. DNP Project I. 3.** In collaboration with a facility, learners will examine clinically relevant data to target a practice and/or patient outcome for improvement. Learners will collect and critically appraise related evidence and develop an intervention, including an outcome evaluation plan. *Prerequisite:* Admission to DNP program.

**5892. DNP Project II. 3.** Continuation of NURS 5891, DNP Clinical Research Project I. In collaboration with a facility, learners will implement the proposed clinical intervention, evaluate the outcome, and professionally disseminate the results. *Prerequisite:* Admission to DNP program.

**5985. Final DNP Practicum. 6.** This final clinical experience provides learners with the opportunity to integrate previous learning from the DNP program in the provision of evidence-based health care. *Prerequisite:* Admission to DNP program.

**5900. Practicum in College Teaching. 1-3 (Max. 3).** Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

**5920. Continuing Registration: On Campus. 1-2. (Max 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5960. Thesis Research. 1-12 (Max. 24).** Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrolled in a graduate degree program.

## School of Pharmacy

292 Health Sciences, 766-6120

FAX: (307) 766-2953

Web site: [www.uwyo.edu/Pharmacy](http://www.uwyo.edu/Pharmacy)

Dean: Linda Gore Martin

Associate Dean of Academic and Student

Affairs: Tonja M. Woods

Associate Dean of Research and

Outcomes: Kem P. Krueger

### Professors:

**LINDA G. MARTIN**, B.S. University of Wyoming 1975; M.B.A. 1979; Pharm.D. Creighton University 1998; Professor of Social and Administrative Pharmacy 2013, 2006, 2000.

**SREEJAYAN NAIR**, B.S. College of Pharmaceutical Sciences, Manipal, India 1989; M.S. 1991; Ph.D. 1996; Professor of Pharmacology 2014, 2002.

**JUN REN**, B.S. Beijing University 1985; M.D. Peking Union Medical College 1989; Ph.D. University of Alberta 1994; Professor of Pharmacology 2005, 2002.

### Associate Professors:

**E. KURT DOLENCE**, B.S. University of Wyoming 1983; Ph.D. University of Kentucky 1987; Associate Professor of Medicinal Chemistry 2005, 1999.

**CAROL HERMANSON KOBULNICKY**, B.S. University of Wisconsin 1992; M.S. 1998; Ph.D. 2002; Associate Professor of Social/Administrative Pharmacy 2009, 2002.

**KEM P. KRUEGER**, Pharm.D. University of Missouri-Kansas City; Ph.D. University of Arizona 1998; Associate Professor of Social and Administrative Pharmacy 2006.

**TRACY D. MAHVAN**, B.S. University of Colorado 1995; Pharm.D. 1998; Associate Professor of Pharmacy Practice 2006, 2000.

**M. GLAUCIA TEIXEIRA**, B.S. Federal University of Ceara 1975; M.S. 1982; Ph.D. Universit Paul Sabatier 1992; Associate Professor of Pharmaceutics 2001, 1995.

### Assistant Professors:

**TRAVIS BROWN**, B.S. Washington State University 2002; Ph.D. Washington State University 2008; Assistant Professor of Pharmaceutical Science 2012.

**JARED S. BUSHMAN**, B.A. University of Utah 2003; M.S. University of Rochester 2006; Ph.D. 2008; Assistant Professor of Pharmaceutical Science 2014.

**GUANGLONG HE**, B.S. Anhui Normal University 1986; M.S. Chinese Academy of Sciences 1994; Ph.D. 1997; Assistant Professor of Medicinal Chemistry 2013.

**RESHMI L. SINGH**, B.S. Bombay University 1999; M.S. University of Toledo 2001; Ph.D. University of Minnesota 2005; Assistant Professor of Social and Administrative Pharmacy 2013.

**LARRY B. STAUBACH**, B.A. University of Dayton 1976; M.D. University of Cincinnati 1981; M.B.A. Xavier University 1991; Assistant Professor of Social and Administrative Pharmacy 2012.

**BASKARAN THYAGARAJAN**, B.S. Madras Medical College 1994; M.S. Banaras Hindu University 1996; Ph.D. Karl Franzens University 2001; Assistant Professor of Pharmaceutics 2011.

### Clinical Associate Professors:

**MICHELLE L. HILAIRE**, Pharm.D. Duquesne University 2002; Clinical Associate Professor of Pharmacy Practice 2012, 2010, 2004.

**JAMIE R. HORNECKER**, B.S. Texas Tech University 1999; Pharm.D. University of Wyoming 2003; Clinical Associate Professor of Pharmacy Practice 2012.

**JANELLE L. KRUEGER**, B.S. University of Wyoming 1992; M.S. University of Kansas 1997; Clinical Assistant Professor of Pharmacy Practice 2012, 2005.

**MARY ONYSKO**, B.S. Oregon State University 2003; Pharm.D. 2006; Clinical Assistant Professor 2012, 2007.

**TONJA M. WOODS**, Pharm.D. University of Wyoming 2002; Clinical Associate Professor of Pharmacy Practice 2012, 2009, 2003.

### Clinical Assistant Professors:

**LAUREN BIEHLE**, Pharm.D. University of Georgia 2010; Clinical Assistant Professor 2012.

**LANAE L. FOX**, Pharm.D. University of Wyoming 2010; Clinical Assistant Professor 2012, 2011.

**CARA HARSHBERGER**, Pharm.D. University of Illinois 2005; Clinical Assistant Professor of Pharmacy Practice 2012.

**BECKY S. LINN**, B.A. University of Wyoming 1997; Pharm.D. 2002; Clinical Assistant Professor 2013.

**ALLISON M. MANN**, B.S. University of Colorado Boulder 2004; Pharm.D. University of Colorado Denver 2009; Clinical Assistant Professor of Pharmacy Practice 2014.

**LEENA D. MYRAN**, B.S. University of Wyoming 2000; Pharm.D. 2012; Clinical Assistant Professor of Pharmacy Practice 2014.

**THANH-NGA NGUYEN**, B.S. University of California Santa Barbara 2002; Pharm.D. University of Wyoming 2012; Clinical Assistant Professor 2014.

**JEREMY VANDIVER**, B.A. University of Colorado 2006; Pharm.D. University of Colorado 2010; Clinical Assistant Professor 2012.

#### Assistant Lecturer:

**ANTOINETTE K. BROWN**, B.S. University of Wyoming 1992; Assistant Lecturer 2013.

**DAVID C. BRUCH**, B.S. University of Wyoming 1998; Pharm.D. 2010; Assistant Lecturer 2012.

#### Drug Information Director

**MELISSA L. HUNTER**, B.S. University of Wyoming 2000; Pharm.D. 2004; Associate Research Scientist 2013, 2007.

#### Professors Emeriti:

H. John Baldwin, Ph.D.

Emery Brunett, Ph.D.

Bruce W. Culver, Ph.D.

Kenneth F. Nelson, Ph.D.

Robert B. Nelson, Ph.D.

Robert D. Scalley, Pharm.D.

Beverly, Sullivan, Pharm.D.

John H. Vandell, B.S. Pharmacy

Weeranuj Yamreudeewong, Pharm.D.

## Vision, Mission and Values

### Vision

The University of Wyoming School of Pharmacy will be nationally recognized for innovative research, teaching and pharmacy practice that develops scholar-practitioners and substantively enhances the health and well-being of the communities we serve.

### Mission

The University of Wyoming School of Pharmacy exists to advance the educational and professional development of our students, generate and translate scientific findings into meaningful innovations in healthcare, and positively impact the health and well-being of the communities we serve. We accomplish this through:

- Innovative, collaborative and interdisciplinary programs that integrate research, teaching and pharmacy practice
- The development of scholar-practitioners capable of ethically leading and embracing change and substantively enhancing health outcomes
- Individualized, faculty-led student educational experiences

As a result, we will attract, recognize and retain the very best students, faculty and staff to drive the success of the School.

## Statement of Values

The UW School of Pharmacy community is committed to supporting and promoting individual and collective excellence in teaching, research, service and pharmacy practice. We value responsibility, compassion, respect, and integrity in all endeavors.

## Learning Outcomes

The University of Wyoming adheres to the American Association of Colleges of Pharmacy Center for Advancement of Pharmaceutical Education (CAPE) educational outcomes 2013. This multipage document (and its supplements) can be accessed at [www.aacp.org](http://www.aacp.org). The school has outlined student/curriculum learning outcomes; these are available on the school website.

## Student/Faculty Relations

The faculty and staff at the School of Pharmacy treat students as adults and expect appropriate behavior as beginning professionals. The School of Pharmacy recognizes that the profession of pharmacy demands of its members the utmost degree of professional competence, ethical behavior, and integrity. Upon enrolling at the University of Wyoming SOP and at the start of each academic year, all students will sign a pledge acknowledging that they have received and read the current Honor Code and that they have made a personal commitment to uphold the code and abide by its principles. Similarly, the School of Pharmacy Code of Professional Expectations for faculty and staff is built on the foundation of respect for others, personal responsibility, the creation and maintenance of trust, and honesty and truthfulness. The administration, faculty, staff, students, and alumni of the School of Pharmacy at the University of Wyoming should strive to set an example of ethical leadership and professional behavior as those traits are essential for good social and business interactions.

## Accreditation and Membership

In Wyoming, as in most other states, one requirement for examination and registration as a pharmacist is graduation from an accredited entry-level professional program at a school or college of pharmacy. The Accreditation Council for Pharmacy Education (ACPE), the national accrediting agency for pharmacy, accredits pharmacy degree programs.

(The Doctor of Pharmacy program at UW was most recently accredited in 2012 following an on-site evaluation by the ACPE in October

2012.) Verification of current accreditation status may be made by: a) contacting the Dean's Office, School of Pharmacy; b) connecting to [www.uwyo.edu/pharmacy/](http://www.uwyo.edu/pharmacy/); c) contacting the Accreditation Council for Pharmacy Education (135 South LaSalle Street, suite 4100 Chicago IL 60603, (312) 664-3575; [csinfo@acpe-accredit.org](mailto:csinfo@acpe-accredit.org)) or d) by checking the latest Annual Directory of Accredited Professional Programs published by ACPE.

The school is a member of the American Association of Colleges of Pharmacy and adheres to its educational standards.

## Preprofessional Program and Requirements

Applicants for the professional program in pharmacy must complete preprofessional requirements before they can be admitted. Usually, a minimum of four semesters (two academic years totaling 67 credit hours) is required to complete preprofessional requirements.

All preprofessional coursework must be completed by the end of the spring semester prior to matriculation in the professional program.

Graduates of fully accredited high schools may be admitted to the preprofessional program with a math placement score of 3 or an ACT math score of 23. Students transferring into the preprofessional program must have a GPA of 3.0.

For students who do not meet these requirements, it is suggested that they major in Health Sciences undeclared for their first year until they meet the requirements.

## Preprofessional Program (PPCY) Required Curriculum Suggested Course Sequence

<b>FIRST YEAR: Fall</b>		<b>Hrs.</b>
CHEM	1020.....	4
ENGL	1010 .....	3
LIFE	1010 .....	4
Electives	.....	3
USP Physical Activity and Health	.....	1
I Course	.....	1
<b>Total Hrs.</b>		<b>16</b>
<b>FIRST YEAR: Spring</b>		<b>Hrs.</b>
CHEM	1030.....	4
LIFE	2022.....	4
MATH	2200 .....	4
POLS	1000.....	3
Electives	.....	3
<b>Total Hrs.</b>		<b>18</b>

<b>SECOND YEAR: Fall</b>		<b>Hrs.</b>
ENGL	2020 or 2030 or USP Writing requirement.....	3
CHEM	2420.....	4
STAT	2050.....	4
KIN/ZOO	2040 .....	3
KIN/ZOO	2041 .....	1
<b>Total Hrs.</b>		<b>15</b>

<b>SECOND YEAR: Spring</b>		<b>Hrs.</b>
MOLB	2240.....	5
CHEM	2440.....	4
ZOO	3115 .....	4
Electives	.....	4
<b>Total Hrs.</b>		<b>17</b>

## Electives

Students entering the university in the preprofessional program must fulfill University Studies Program (USP) requirements. The School of Pharmacy is committed to ensuring graduates are truly educated individuals with a broad general education as well as professional knowledge and skills. This general education component is achieved by completion of the University Studies Program requirement. Each student, both professional and preprofessional, is assigned an adviser to assist him or her in making appropriate academic choices.

## Professional Doctoral Program Admission

Admission to the professional program leading to the entry-level Pharm. D. degree is limited to 52 students per year and is highly competitive. Admission is granted by the School of Pharmacy Dean upon the advice of the School of Pharmacy Admissions Committee. Students applying to the UW School of Pharmacy must use the PharmCAS application ([www.pharmacas.org](http://www.pharmacas.org)) process. All materials (PCAT scores, and Letters of Recommendation) are submit to UW using this service. The School of Pharmacy requires no supplemental application. Students granted admission to the professional program will have to pay a one-time, non-refundable, seat fee to guarantee their placement into the entering class. In addition students will be required to complete any immunizations necessary for experiential rotations. As part of a College of Health Sciences requirement students are also expected to complete and pass a background check prior to final admission to the professional program.

The School of Pharmacy's Technical Standards can be found at [http://www.uwyo.edu/pharmacy/\\_files/documents/admin/uwsop-technical-stds-3-2013.pdf](http://www.uwyo.edu/pharmacy/_files/documents/admin/uwsop-technical-stds-3-2013.pdf).

## Program of Study Requirements for Graduation

The degree of Doctor of Pharmacy (Pharm.D.) is granted upon satisfactory completion of 146 hours in the professional curriculum in accordance to the school's academic standards and the fulfillment of the general university requirements. Transfer students who have previous professional pharmacy credits accepted as partial completion of residence work may not earn a degree from this university for less than 30 semester hours of resident credit in the professional program of this School of Pharmacy over a minimum of two resident semesters.

## Graduation with Honors

The University of Wyoming School of Pharmacy is authorized to grant honors for academic excellence. A Doctor of Pharmacy with honors designation is awarded by the University of Wyoming to students who graduate with exceptional scholarship in Pharmacy.

Exceptional scholarship in pharmacy is defined as a student who is on track to graduate with their class from the University of Wyoming School of Pharmacy and is in the top 5% of their class based on their pharmacy GPA (as assessed at the end of the fall semester of the P4 year). The Pharmacy GPA is calculated on the basis of required professional pharmacy curriculum coursework and excludes required or selected elective hours. The honors distinction must be approved by a School of Pharmacy faculty vote.

## Academic Honesty and Professional Conduct

Students admitted to the professional program are required to participate and sign the University Of Wyoming School Of Pharmacy Honor Code. Failure to sign the honor code will result in a withdrawal of admission offer or termination from the professional program.

## Academic Standards for Progression and Graduation

The course of study in the School of Pharmacy (SOP) is four academic years leading to a Doctor of Pharmacy degree (PharmD). The required professional coursework is organized in a prescribed, non-negotiable, sequential manner. All students have a P-designation identifying their year in the program (P1, P2, P3, P4). Required professional courses (PHCY courses) from any national or international pharmacy programs will not be applied to the

UW PharmD degree. Courses taken as S/U, including electives, are usually considered unacceptable in fulfilling program requirements. Auditing courses for credit towards the PharmD degree is also not allowed.

The academic standards herein described are expected to be followed by all students admitted to the professional program. Any violation will constitute grounds for probation or termination from the professional program and will delay progression towards advanced coursework. A leave of absence may be necessary in cases where poor academic performance is due to a medical or personal hardship. The student may appeal sanctions related to violations of the academic standards and decisions that result in probation and termination in the program. Appeals start at the School level, followed by College and University levels, according to policy.

## Academic Standards

### Progression

1. Students must receive a grade of C or better in all 146 credit hours of coursework completed while in the professional program.
2. For progression, students must earn a GPA of 2.0 or better in both University coursework and professional program courses each semester and cumulatively.
3. Students must complete at least 12 hours of coursework applicable to the pharmacy degree during each semester while in good standing.
4. Required Pharmacy coursework successfully completed with a B or better prior to admission to the program is not automatically applied to the PharmD degree. The student may petition that coursework to be applied to the program, but must replace those credit hours with additional elective courses.
5. Incompletes must be completed prior to progression into the next academic semester and will halt progression in experiential coursework.
6. Students who earn a D or lower in any experiential coursework will have their rotation sequence halted.
7. A professional pharmacy program course can be repeated only once.
8. A maximum of three required courses are allowed to be repeated during the degree program.



## Probation

Probation is a period of time in which the student is allowed to continue in the program under supervision. Students that do not meet academic standards and are placed on probation will have to submit a petition that includes an individualized plan of study for the next semester. This plan must be developed by the student in agreement with and signed by the academic advisor. The petition will be reviewed by the Student Affairs Committee (SAC), which will send a recommendation to the Dean for approval or denial.

9. A grade of D or lower in any course (core or elective) during the professional program constitutes failure to progress to the next semester and P-designation, and probationary status will be required for continuation in the program.

## Termination

10. Failure to meet any academic standards for two semesters (not necessarily consecutive) in didactic and/or experiential coursework results in automatic termination from the professional program.
11. Failure of two experiential courses, not necessarily consecutive, results in termination from the professional program.
12. All academic requirements in the program must be completed in a maximum of 6 years.

Students shall be terminated from the program if graduation is not achieved at the end of the 6th year from their official admission date to the professional program.

## Graduation

13. Graduation with a PharmD degree requires a cumulative GPA of 2.50 in coursework taken as a professional student (both total University coursework GPA and required professional program GPA) and the successful completion of 146 hours of coursework.

## Elective Credits Policy

The purpose of electives at the School of Pharmacy (SOP) is to complement the pharmacy curriculum, expand knowledge within a specific pharmacy discipline and to ensure completion of the general liberal arts education of the University of Wyoming. Therefore, the following policies have been approved by the faculty for the Doctor of Pharmacy professional program (hereafter, Program).

1. As published in the University Catalog and SOP brochure students are required to complete a minimum number of electives, specific for the student's year of matriculation into the Program. This number may vary and may be modified as adjustments are made to the professional curriculum to comply with accreditation standards. Students will be made aware of this number during initial orientation into the Program and kept informed of any changes during their stay in the academic program.
2. Students must take elective courses to satisfy first the requirements of the University Studies Program (hereafter, USP) and then complete the remaining required elective credits as general elective coursework (Program-approved required number of elective hours).
3. Students are required to complete all USP requirements even if they exceed the minimum number of elective hours initially defined in their Program in order to graduate from UW.
4. All general elective coursework must be upper division (UW 3000 level or above) to ensure adequate rigor appropriate to a professional program.
  - a) All University of Wyoming online courses at 3000 level or above are accepted for elective credit toward the Program.
  - b) Transfer or online courses equivalent to UW 3000 level or above from other accredited four-year institutions may be honored as elective credits toward the Program.
5. All required hours (including electives) must be completed by students before progressing into the P4 rotation year. Students will not be allowed to progress toward the 4th year rotations if their academic records show that less than a total of 107 credits were completed and/or university studies requirements were not fulfilled.
6. When an elective course is approved through a petition, enrollment in the course must occur during the semester for which it was approved, i.e. if the student changes his/her mind, the course will have to be petitioned again to be taken during another semester.
7. Courses offered through any community colleges, including Wyoming community colleges, regardless of their level or type

(online or not), are usually neither transferable nor accepted as elective credits toward the Program.

8. Students shall not take electives as Satisfactory/Unsatisfactory (S/U) credit.
9. All courses taken in the preprofessional program or to fulfill requirements in a previous degree cannot be retaken to count as elective hours in the Program.
10. Credit by exam through the Foreign Languages Dept. will not be accepted as fulfillment of elective requirements in the Program. However, it is a student's right to earn credit by exam for Wyoming History and Government, and Physical Education lecture while receiving elective credits toward the Program and fulfilling USP requirements.

For procedures and handling of all exceptions to these policies, the students should consult the SOP brochure, the student handbook, the SOP website, or check with the Manager of Pharmacy Student Services or the Associate Dean for Student Affairs.

## Requirements for Graduation

The degree of Doctor of Pharmacy (Pharm.D.) is granted upon satisfactory completion of the professional curriculum in accordance to the school's academic standards and the fulfillment of the general university requirements. Transfer students who have previous pharmacy credits accepted as partial completion of residence work may not earn a degree from this university for less than 30 semester hours of resident credit in the professional program of this School of Pharmacy over a minimum of two resident semesters.

## Curriculum

The School of Pharmacy offers only the four-year curriculum leading to the Doctor of Pharmacy (Pharm.D.) degree.

In order to keep abreast with changes in pharmaceutical education, the following curriculum is subject to change or modification as required by the accrediting agency. Students should be aware that changes must be expected and they will be included in their academic program. The School of Pharmacy does not plan to change graduation requirements inadvertently, but does reserve the right to change any provisions or requirement deemed necessary at any time within the student's term of residence. Students should note that classes are usually scheduled Monday through Friday, but may include some evening and weekend coursework.

**Doctor of Pharmacy****Required Curriculum****Suggested Course Sequence and Courses**

<b>FIRST YEAR [PH1]: Fall</b>		<b>Hrs.</b>
MOLB 3610	.....	4
PHCY 6100	.....	4
PHCY 6101	.....	1
PHCY 6185	.....	1
PHCY 6106	.....	2
ZOO 4125	.....	4
<b>Total Hrs.</b>		<b>16</b>

<b>FIRST YEAR [PH1]: Spring</b>		<b>Hrs.</b>
PHCY 4450	.....	4
PHCY 6102	.....	4
PHCY 6152	.....	3
PHCY 6354	.....	2
PHCY 6110	.....	3
PHCY 6170	.....	1
PHCY 6285	.....	1
<b>Total Hrs.</b>		<b>18</b>

<b>SECOND YEAR [PH2]: Summer</b>		<b>Hrs.</b>
PHCY 6480	.....	4
PHCY 6482	.....	4
<b>Total Hrs.</b>		<b>8</b>

<b>SECOND YEAR [PH2]: Fall</b>		<b>Hrs.</b>
PHCY 6210	.....	3
PHCY 6245	.....	3
PHCY 6220	.....	3
PHCY 6230	.....	4
PHCY 6250	.....	3
PHCY 6280	.....	1
<b>Total Hrs.</b>		<b>17</b>

<b>SECOND YEAR [PH2]: Spring</b>		<b>Hrs.</b>
PHCY 6211	.....	3
PHCY 6231	.....	4
PHCY 6241	.....	3
PHCY 6251	.....	3
PHCY 6270	.....	1
Elective	.....	4
<b>Total Hrs.</b>		<b>18</b>

<b>THIRD YEAR [PH3]: Fall</b>		<b>Hrs.</b>
PHCY 6312	.....	3
PHCY 6341	.....	3
PHCY 6350	.....	4
PHCY 6356	.....	1
PHYC 6357	.....	2
Electives	.....	4
<b>Total Hrs.</b>		<b>17</b>

<b>THIRD YEAR [PH3]: Spring</b>		<b>Hrs.</b>
PHCY 6342	.....	3
PHCY 6343	.....	2
PHCY 6351	.....	4
PHCY 6103	.....	2
PHCY 6104	.....	1
PHCY 6370	.....	1
<b>Total Hrs.</b>		<b>13</b>

**FOURTH YEAR [PH4]:** *Consists of nine experiential rotations of four credit hours each and three reflective learning weeks. Rotations are considered full-time. Students may not enroll in any other coursework concurrent with rotations. Consequently, all other coursework (107 credits) must be satisfactorily completed before enrollment in P4 coursework. Note: Students will be required to live in locations other than Laramie when enrolled in experiential rotations. Responsibility for living cost and travel arrangements associated with experimental rotations rests with the student. Students participating in all experimental activities will be required to have a vehicle or an acceptable approved alternative.*

**FOURTH YEAR [PH4]: Summer, Fall, and Spring**

		<b>Hrs.</b>
Experiential Rotations 1	.....	4
Experiential Rotations 2	.....	4
Experiential Rotations 3	.....	4
PHCY 6485	.....	1
Experiential Rotations 4	.....	4
Experiential Rotations 5	.....	4
Experiential Rotations 6	.....	4
PHCY 6485	.....	1
Experiential Rotations 7	.....	4
Experiential Rotations 8	.....	4
Experiential Rotations 9	.....	4
PHCY 6485	.....	1
<b>Total Hrs.</b>		<b>39</b>

Students must complete the following Core or Required Experiential Rotations (subject to change):

- 6470-Internal Medicine I
- 6471-Internal Medicine II
- 6473-Ambulatory Care I
- 6481-Advanced Community Pharmacy
- 6483-Advanced Institutional Pharmacy
- Plus 4 Elective Rotations (PHCY 6465)

**Graduate Study**

At present, no program for graduate degrees in pharmacy is being offered; however, some courses that may be counted at the graduate level are offered. For courses that can be taken at the graduate level please contact the School of Pharmacy.

**Pharmacy (PHCY)**

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀Q]).

**1101. First-Year Seminar. 3. [(none)◀FYS]**  
**3670. Historical Foundations for the Health Care Professions. 3.** Provides basis for understanding roles of health care professionals of today. Examines societal evolution of the arts and sciences that provide the

foundation upon which the health sciences are established. *Prerequisite:* 3 semester hours of history or consent of instructor.

**4160. Problems in Pharmacy. 1-4 (Max. 8).** Original investigation on a library or laboratory problem concerned with a definite phase of work in pharmacy. *Prerequisite:* consent of instructor.

**4170. Pharmacy Seminar. 1-4 (Max. 8).** Students present oral reports on selected topics of pharmaceutical interest for discussion by the group. *Prerequisite:* consent of instructor.

**4370 [3630]. Phytomedicinal Agents. 2.** Evaluates herbal medicines from scientific viewpoint. Introduces chemistry, pharmacology, toxicology and therapeutic use of selected phytomedicinal agents. *Prerequisite:* advanced standing in nursing, professional program in pharmacy or consent of instructor.

**4450. Pathophysiology. 4.** Clinical concepts of dynamic disease processes in humans. Biochemical, physiological, and morphological disease mechanisms are related to symptomatology and treatment. *Prerequisites:* LIFE 1010, CHEM 1000 or 1020 and 1030, KIN/ZOO 2040, 2041, ZOO 3115 or 3120. (Normally offered spring semester)

**4470 [3510]. Fundamentals of Pharmacology. 4.** Studies pharmaceutical agents used for treatment, diagnosis or prevention of disease with particular emphasis on mechanisms of action, therapeutic and adverse effects. *Prerequisite:* PHCY 4450. (Normally offered fall semester)

**4550. Non-Prescription Medications and Devices. 3.** Develops knowledge and skills to help health care professionals function as therapeutic advisers to clients in the self-care of disease states amenable to management with non-prescription medication and/or devices. *Prerequisites:* PHCY 4450 or consent of the instructor.

**4660. Health Care Law. 3.** A survey of health care law for students in health care programs, law students, and other matriculated students. The subject matter will include but not be limited to the following: malpractice, licensing, informed consent, reform, reproduction and advance directives. Dual listed with PHCY 5660. *Prerequisite:* consent of instructor.

**5140. Pharmacotherapy for Primary Care. 3.** Prepares primary care practitioners in drug therapy management for various client populations, emphasizing rural practice. Cross listed with NURS 5140. *Prerequisite:* B.S.N., baccalaureate in health care field or consent of instructor.

**5210. Pharmaceutical Regulatory Systems. 3.** Regulatory theory and practice is used to study the authority/responsibilities of three

federal agencies that are entrusted to ensure the safe, effective, and efficient medication use in the United States. The practices and procedures of the FDA, DEA, and CMS are reviewed, describing why healthcare providers should comply with regulatory principles. *Prerequisite:* Enrollment in graduate or professional program or department permission.

**5240. Pharmaceutical Homicide. 3.** Legal pharmaceutical products are sometimes used by healthcare professional criminals to kill people. This course focuses on identifying the zone of risk for people who could be harmed by pharmaceuticals, and the development of best practices to protect patients and other from the harm. *Prerequisite:* Enrollment in graduate or professional program or department permission.

**5550. Advanced Cardiovascular Physiology and Pharmacology. 3.** An advanced study in the integration of modern cardiovascular physiology, pharmacology, biochemistry and cell biology concepts. Dual listed with PHCY 6550. *Prerequisites:* PHCY 6230 (or equivalent).

**5660. Health Care Law. 3.** A survey of health care law for students in health care programs, law students, and other matriculated students. Subject matter includes, but is not limited to, the following: malpractice, licensing, informed consent, reform, reproduction and advanced directives. Dual listed with PHCY 4660. *Prerequisite:* consent of instructor.

**5887. Molecular Neuropharmacology. 3.** Focus on the molecularly-induced functional changes within the nervous system in normal and disease states. In addition, will provide a thorough explanation of the cellular and molecular actions of drugs on synaptic transmission and discuss the neurochemical basis of behavior. *Prerequisites:* PharmD current standing and instructor's permission or NEUR 5280.

**5920. Agents for Diagnostic Imaging. 2.** Diagnostic Agents is currently designed as a one semester elective course with 2 credit hours. It is an introduction and survey of all diagnostic drugs used in the diagnosis and imaging of disease as approved by the US FDA for use in the United States. *Prerequisites:* PHCY 6211, PHCY 6210, PHCY 6110, CHEM 2440, MOLB 3610.

**6100. Dose Form Design. 4.** Extensively introduces various types of dosage forms, discusses advantages and disadvantages of each. Pharmaceutical calculations are a major component of the course, as well as physicochemical principles involved in dose form stability. *Prerequisites:* CHEM 2420 and 2440.

**6101. Practical Aspects of Dosage Form Design. 1.** Preparation and evaluation of dosage forms is main thrust of course. Laboratory

emphasizes manipulative and mathematical skills, prescription formats, packaging and storage as they apply to pharmaceuticals. *Prerequisites:* concurrent enrollment in PHCY 6100; MATH 2100.

**6102. Biopharmaceutics and Pharmacokinetics. 4. [(none)◀COM3]** Discusses biopharmaceutic and pharmacokinetic aspects of dosage form design. Basic pharmacokinetics and biopharmaceutics are interrelated to clinical applications. Also covers classical kinetics and dissolution. *Prerequisites:* MATH 2200 and PHCY 6100.

**6103. Sterile Products. 2.** An introduction to the preparation and clinical application of sterile dosage forms. Emphasizes basic principles related to preparation, dispensing and administration of parenteral medications in extended care and hospital pharmacy practice. *Prerequisites:* PHCY 6100, 6101, 6105, and concurrent enrollment in PHCY 6104.

**6104. Sterile Products Laboratory. 1.** A hands-on training in techniques used to prepare, dispense and administer parenteral admixtures, parenteral nutrition, chemotherapy and ophthalmics. *Prerequisites:* PHCY 6100, 6101, 6105 and concurrent enrollment in PHCY 6103.

**6106 [6105]. Pharmaceutical Calculations. 2.** Application of basic mathematics and quantitative reasoning to pharmaceutical calculations, emphasizing calculations of doses, dosage requirements, compounding of formulations and parenterals. *Prerequisites:* MATH 1000 or 1400.

**6110. Medicinal and Natural Products Chemistry I. 3.** Three-semester series that studies the physicochemical, biochemical and pharmacological properties of substances of natural and synthetic origin that are used as medicinal agents. *Prerequisites:* CHEM 2440 and MOLB 3610.

**6152 [6352]. Therapeutics I. 3.** Emphasizes the role of the pharmacist in pharmaceutical self care, appropriate triage and referral involving prescription, non-prescription pharmaceuticals, complimentary, alternative therapies and devices in community dwelling patients with both acute and chronic self-care conditions. *Prerequisite:* enrollment in the doctor of pharmacy professional program.

**6170. Introductory Pharmacy Practicum. 1.** Provides an early curricular exposure to the roles and functions of pharmacists in their work environment through a shadow experience. *Prerequisites:* satisfactory completion of PHCY 6185.

**6185. Seminar: Role of the Pharmacist in Health Care. 1.** Provides an overview and survey of the scope of pharmacy, including

educational and licensing requirements; career opportunities, pharmacy organizations and regulatory agencies, and historical evolution. *Prerequisite:* admission to the professional program.

**6210. Medicinal and Natural Products Chemistry II. 3.** Continuation of Medicinal and Natural Products Chemistry I. *Prerequisite:* PHCY 6110.

**6211. Medicinal and Natural Products Chemistry III. 3.** Continuation of Medicinal and Natural Products Chemistry II. *Prerequisite:* PHCY 6210.

**6220. Pathophysiology II. 3.** Continuation of PHCY 4450. Students work closely with clinical case studies. *Prerequisite:* PHCY 4450.

**6230. Pharmacology I. 4.** First semester of a one-year series. Studies action of chemical agents on living systems to include pharmacodynamics, toxicology, and clinical therapeutics. Concepts are emphasized through case presentations and discussion. 4.0 credit hours; lecture with separately scheduled discussion section. *Prerequisite:* PHCY 4450.

**6231. Pharmacology II. 4.** Second semester of a one-year series. Continuation of PHCY 6230. Lecture with separately scheduled discussion section. *Prerequisite:* PHCY 6230.

**6241. Organizational and Societal Issues Within the Health Care System. 3. [(none)◀COM3]** Surveys U.S. health care system. Discusses organization, insurance programs, legislation and health care professionals. Also discusses sociological issues pertinent to the patient and illness, the role of the pharmacist, and drugs and drug use. *Prerequisite:* enrollment in the professional program, School of Pharmacy or consent of instructor.

**6242. Public Health. 3.** Encompasses essentials of medical sociology, biology, chemotherapy and public health of communicable diseases; chronic diseases; and environmental health problems. *Prerequisite:* successful completion of year one of the Doctor of Pharmacy program or consent of instructor.

**6245. Patient/Professional Interactions. 3. [(none)◀COM3]** Focuses on psychosocial and communication concepts pertaining to human interactions, with application to professional practice environments and clinical counseling situations. *Prerequisite:* enrollment in the doctor of pharmacy professional program.

**6250. Drug Literature Evaluation. 3. [WC,L◀COM3]** Provides a knowledge base, techniques and skills for information retrieval, evaluation of medical and pharmaceutical practice literature, and application to specific patient problems. *Prerequisite:* STAT 2050 or equivalent; WB designated course.

**6251. Therapeutics II. 3.** Introduces pharmacotherapeutic principles employed in the management and monitoring of drug therapy. Assesses the impact of drug therapy on clinical laboratory parameters, metabolic states, and specific patient populations. Introduces the pharmacotherapeutic management of common disease states. *Prerequisites:* PHCY 6220, 6230.

**6270. Intermediate Pharmacy Practicum. 1. [(none)◀COM3]** An advanced exposure to the practice of pharmacy in health care environments. *Prerequisite:* satisfactory completion of PHCY 6170.

**6280 [6385]. Seminar: Pharmacy Ethics. 1.** Focuses on ethical issues confronting pharmacists in practice, pharmacy as a profession, the health care delivery system and society. *Prerequisite:* enrollment in the doctor of pharmacy professional program.

**6281. Pharmacy Research Ethics. 1.** Understanding of the ethical issues that may arise while conducting health science research and potential strategies for properly addressing these ethical issues. *Prerequisite:* concurrent or previous enrollment in PHCY 6280.

**6285. Seminar: The Drug Use Process. 1.** Focuses on how and why people use pharmaceuticals; people as patients; illness and wellness behavior; drug misadventuring, and appropriate intervention strategies. *Prerequisite:* PHCY 6185 or consent of instructor.

**6286. Seminar: Pharmacy Practice Theories. 1.** Focuses on the application of theories from the pharmaceutical and related literature with application to pharmacy practice. *Prerequisite:* PHCY 6285 or consent of the instructor.

**6290. Topics in Pharmacology. 2. [W3▶(none)]** Writing-intensive course using topics to explore the role of drugs in health care provision. *Prerequisite:* prior credit or concurrent enrollment in PHCY 6230 or 6231 or consent of instructor.

**6312. Clinical Toxicology. 3.** Focuses on biological and pharmacological effects of environmental, chemicals, OTC and prescription drug poisoning cases. Emphasis will be placed on the use of historical, laboratory and clinical data to diagnose and develop clinical management approaches for both acute and chronic poisoning cases. *Prerequisites:* PHCY 6230, MOLB 3610.

**6341. Pharmacy Practice Law. 3.** Coverage of state, federal and local laws and regulations which relate directly to the practice of pharmacy. The Wyoming Pharmacy Act serves as a model for analogous laws in other states. Case law at the federal and state levels affecting pharmacy practice is analyzed and discussed. *Prerequisite:* PH3 or consent of instructor.

**6342. Pharmacy Administration. 3.** Examines management of pharmaceutical services, analysis of drug distribution systems in the U.S., contemporary pharmacy practice and problems common or peculiar to all types of pharmacy services. *Prerequisite:* PH3 status.

**6343. Pharmacoeconomics. 2.** Designed to provide the student with the techniques to evaluate health care economic data for application to the pharmaceutical care of patients. *Prerequisites:* MATH 2200; PHCY 6250.

**6350. Therapeutics III. 4.** A study of the basic principles employed in the pharmacotherapeutic management of common disease states. Includes the pharmacist's role in monitoring drug therapy of the patient and serving as a drug consultant to the health care team. *Prerequisite:* grade of C or higher in PHCY 6251.

**6351. Therapeutics IV. 4.** Continuation of Therapeutics I. *Prerequisite:* grade of C or higher in PHCY 6350.

**6354. Pharmacy Practice Laboratory. 2.** Emphasizes the application of patient and disease state management pharmaceutical care skills by modeling patient care clinics, community practice and institutional practice. Emphasizes patient counseling, assessment, monitoring and development of patient care plans in "mock" patient scenarios. *Prerequisites:* enrollment in the doctor of pharmacy professional program.

**6356. Physical Assessment in the Evaluation of Drug Therapy. 1.** Physical examination techniques and the interpretation of physical examination data. Emphasis is on a systemic approach to the physical examination, evaluation of patient data, maintaining patient charts, monitoring of patient outcomes and development of treatment plans. *Prerequisite:* P3 status or consent of instructor.

**6357. Clinical Pharmacokinetics. 2.** Pharmacokinetic principles of dosage regimen calculation and pharmacokinetic considerations relating to the use of various drugs. Clinical pharmacokinetics of therapeutically important drugs will be covered. *Prerequisite:* PHCY 6102.

**6370. Advanced Pharmacy Experience Orientation. 1. [(none)◀COM3]** Designed to prepare the student for 4<sup>th</sup> year experiential activities by discussion of logistics, professionalism, regulatory issues, and assessment tools. *Prerequisites:* Good standing in the P3 year or consent of instructor.

**6386. Seminar: Future Trends. 1.** Focuses on internal and external trends that have the potential to affect the practice of pharmacy in the future. Students are expected to discern potential trends from a variety of literature

sources and project the potential effects on their future practice. *Prerequisite:* P3 status or consent of the instructor.

**6465. Elective Rotation In \_\_\_\_\_. 4 (Max. 16).** Advanced practice experience in a variety of pharmacy practice, patient care, health care management, and pharmaceutical industry environments. Application of knowledge and skills with active participation in direct pharmaceutical care. Development of knowledge and skills related to specialized patient populations, health care management, and pharmaceutical industry. Students will be required to move to off-campus sites to complete this course. *Prerequisite:* grade of C or higher in PHCY 6351 and 6357.

**6470. Internal Medicine I. 4.** Pharmacy practice experiences with acute care patient populations in community hospitals; exposure to various disease states and patient records; evaluating drug orders in medical records, assessing problems involving patient's drug therapy, monitoring drug therapy to insure effective, safe, and economical patient care, and applying drug information skills. *Prerequisite:* grade of C or higher in PHCY 6351 and PHCY 6357.

**6471. Internal Medicine II. 4. [(none)◀COM3]** Advanced practice experiences with general medicine, acute care patient populations in community hospitals. Participation in problem solving and the therapeutic decision-making process, including drug dosage regimen, application of rational therapy. *Prerequisite:* PHCY 6470.

**6473. Ambulatory Pharmaceutical Care. 4. [(none)◀COM3]** An experiential course focusing on the pharmacist as the drug expert in a multidisciplinary health care team approach to treating ambulatory patients within the philosophy of family practice. *Prerequisites:* grade of C or higher in PHCY 6351 and PHCY 6357.

**6480. Introduction to Community Pharmacy Practice. 4.** Four-week rotation in community pharmacy practice completed under the guidance of a licensed pharmacist. Patient care activities will include, but not be limited to, basic patient and drug therapy assessment, performing medication histories and prospective drug utilization reviews, basic patient counseling and active participation in the medication distribution process. *Prerequisites:* grade of C or higher in PHCY 6352 and 6354 and satisfactory completion of all courses within the P1 curriculum (i.e. P2 standing).

**6481. Advanced Community Pharmacy. 4.** An advanced practice experience in community pharmacy that involves student learning and participation in non-dispensing models

of pharmaceutical care, such as pharmacist anticoagulation clinics, vaccination clinics, smoking cessation, diabetic education, chronic disease drug therapy monitoring, self-care treatment, and indigent patient care, etc. *Prerequisite:* grade of C or higher in PHCY 6351 and PHCY 6357.

**6482. Introduction to Hospital Pharmacy Practice. 4.** Four-week rotation in hospital pharmacy practice completed under the guidance of a licensed pharmacist. Patient-care activities will include basic drug therapy and patient assessment, prospective drug utilization reviews, participating in the hospital's medication distribution process, performing calculations, compounding preparations and understanding pharmacy's role within the health-system through interdisciplinary interactions. *Prerequisites:* grade of C or higher in PHCY 6352 and 6354 and satisfactory completion of all courses within the P1 curriculum (i.e. P2 standing).

**6483. Advanced Institutional Pharmacy. 4.** An advanced rotation in institutional pharmacy under the preceptorship of a licensed pharmacist. The student interacts with patients, health care professionals and allied health personnel to assure the best use of medications. *Prerequisite:* grade of C or higher in PHCY 6351 and PHCY 6357.

**6485. Reflective Learning in Pharmacy. 1 (Max. 4).** A debriefing class with emphasis on sharing experiences and making notice of the learning that has occurred during the community pharmacy practicums. This is a one week course to be held the week prior to starting practicums and repeated at 12 week intervals thereafter. Offered S/U Only. *Prerequisite:* PH4 status.

**6550. Advanced Cardiovascular Physiology and Pharmacology. 3.** An advanced study in the integration of modern cardiovascular physiology, pharmacology, biochemistry and cell biology concepts. Dual listed with PHCY 5550. *Prerequisites:* PHCY 6230 (or equivalent).

## Medical Laboratory Science

Aley Hall, UW-Casper, (307) 268-2713

FAX: (307) 268-2416

Web site: <http://www.uwo.edu/outreach/uwcasper/prospective/degrees/mls/mls-index.html>

Director: Jed M. Doxtater, MS MLS (ASCP)<sup>CM</sup>

### Assistant Clinical Faculty:

**JED M. DOXTATER**, B.S. University of Montana 2007; M.S. University of North Dakota 2013; Assistant Clinical Faculty of Medical Laboratory Science 2015.

## Mission and Goals

The mission of the Bachelor of Science in Medical Laboratory Science program at the University of Wyoming-Casper is to educate, train, and produce highly competent, ethical professionals who are committed to lifelong learning. Curriculum is designed to prepare students to meet current and future workplace challenges and technological advancements in the profession.

## Program Goals

1. Provide education in accordance with the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS) standards for Medical Laboratory Science programs.
2. Provide students with adequate knowledge and background experience to successfully complete the national certification examination appropriate to their level of training.
3. Provide opportunity for students to develop skills in effective communication sufficient to serve the needs of patients, public, and other healthcare professionals.
4. Graduate well qualified Medical Laboratory Scientists who can function at a career entry level, and are prepared to meet the workforce needs of the state of Wyoming and the nation.
5. Provide students with professional role models so that they may develop and practice professional behaviors, attitudes and ethics necessary to work in, and promote the field of Medical Laboratory Science.
6. Periodically undergo program review to meet the diverse educational needs of students, accreditation standards and industry demands for qualified, skilled entry level practitioners.
7. Establish an advisory board of professionals, community partners and stakeholders for program development, evaluation and improvement.
8. Promote membership and active participation in professional societies.

## Outcomes

*Description of Entry Level Competencies of the Medical Laboratory Scientist*

At entry level, the medical laboratory scientist will possess the entry level competencies necessary to perform the full range of clinical laboratory tests in areas such as Clinical Chem-

istry, Hematology/Hemostasis, Immunology, Immunochemistry/Transfusion medicine, Microbiology, Urine and Body Fluid Analysis and Laboratory Operations, and other emerging diagnostics, and will play a role in the development and evaluation of test systems and interpretive algorithms.

The medical laboratory scientist will have diverse responsibilities in areas of analysis and clinical decision making, regulatory compliance with applicable regulations, education, and quality assurance/performance improvement wherever laboratory testing is researched, developed or performed.

At entry level, the medical laboratory scientist will have the following basic knowledge and skills in:

- Application of safety and governmental regulations and standards as applied to clinical laboratory science;
- Principles and practices of professional conduct and the significance of continuing professional development;
- Communications sufficient to serve the needs of patients, the public and members of the health care team;
- Principles and practices of administration and supervision as applied to clinical laboratory science;
- Educational methodologies and terminology sufficient to train/educate users and providers of laboratory services;
- Principles and practices of clinical study design, implementation and dissemination of results.

## Accreditation

The UW-C MLS program is currently seeking accreditation by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS). Accreditation is a process of external peer review in which an agency grants public recognition to a program of study or an institution that meets established qualifications and educational standards. Participation in the accreditation process is voluntary since there is not a legal requirement for specialized programs and institutions to participate. However, when students complete a NAACLS accredited program they become eligible to sit for national certification examinations for the profession.

The National Accrediting Agency for Clinical Laboratory Sciences (NAACLS) is a nonprofit organization that independently

accredits medical technologist (MLS), clinical laboratory technician/medical laboratory technician (CLT/MLT), histotechnologist (HTL), histologic technician (HT), pathologists' assistant (Path Asst), diagnostic molecular scientist (DMS) and cytogenetic technology (CT), Phlebotomist (PBT), and clinical assistant (CA) educational programs.

*Contract information:*

National Accrediting Agency for Clinical Laboratory Sciences, 5600 North River Road, Suite 720, Rosemont, IL 60018-5119

<http://www.nacls.org>

### Prerequisites for Admission to the MLS Professional Program

Students must meet the following minimum criteria to be considered for Admitted Major status:

- Medical Laboratory Technician (ASCP) certification or completion of an AS degree in MLT within 5 years or a B.S. degree in a related science.
- Minimum grade point average (GPA) of 2.0 on all course work transferred into the University of Wyoming at Casper from other academic institutions.
- Successful completion of the Medical Laboratory Technician BOC exam is preferred. Students that have not completed the BOC may be admitted with MLS program directors approval.
- Students admitted to the program that do not hold an A.S. in MLT or a B.S. in a related science may be required to complete the University of Wyoming University Studies program in addition to the basic requirements for the Bachelor of Science in Medical Laboratory Science degree. See the current requirements at <http://www.uwyo.edu/unst/>

### Applying for Admission to MLS Professional Program

Students enter the MLS professional program in the fall semester of their junior year. Applications to the MLS program will be available to the student on the 1st Monday of March, and must be completed and submitted to the MLS program director by the last Friday of March.

Students are required to obtain and pay for a criminal background check. These background checks are routinely required by schools, hospitals, and other agencies that participate in the clinical practicums. The results of your criminal background check may determine if you will be admitted to the MLS program. Background check should be obtained from Viewpoint screening (<https://www.viewpointscreening.com/uwyo>).

After completion and submission of the program application and background check, the student must schedule an interview with the program director for an evaluation for acceptance to the MLS program. Interviews will be held between the 1st Monday of April and the last Friday of April. It is the students' responsibility to complete and submit applications, background check, and to schedule an interview with the MLS program director by the due dates posted above.

Students will be assigned clinical practicum sites. Obtaining a clinical practice site is competitive, and students will undergo a selection process to determine, and assign clinical practicum locations. Since training opportunities cannot be guaranteed, if students are not initially placed they will be placed on an alternate list for the next available training session.

Students enrolled in the MLS program will participate in clinical experiences in a variety of agencies. Prior to participating in the clinical experiences, students will be subject to that agency's requirements for a background check, drug testing and/or drug abuse prevention policies. Students are then subject to the random drug testing policy of that agency.

Liability insurance will be required for students entering their senior year coursework. Liability insurance is provided through the University of Wyoming at a cost of \$13.00 / year to the student.

Health Requirements: Proof of the following health requirements to participate in students laboratories or clinical practice must be provided, this includes Health Insurance, Tuberculosis test, Hepatitis B vaccination, Measles, Mumps, Rubella and Tetanus vaccinations. To maintain ongoing enrollment in the MLS program curriculum, you may be required to meet annual requirements as specified by the clinical agency.

### Essential Functions

Applicants must meet certain essential functions as defined by NAACLS. If you feel that you do not meet these essential functions, careful consideration should be made and advisement received before entering the MLS Program. Essential functions are the abilities and essential functions that a student must be able to perform to be successful in the learning experiences and completion of the program.

### Observational Requirements

The MLS student must be able to:

- Observe laboratory demonstrations in which biologicals are tested for their biochemical, hematological, immunological, microbiological, and histochemical components.
- Characterize the color, odor, clarity, and viscosity of biologicals, reagents or chemical reaction products.
- Employ a clinical grade binocular microscope to discriminate among the structural and color (hue, shading, and intensity) differences of microscopic specimens.
- Read and comprehend text, numbers, and graphs displayed in print and on a video monitor.

### Movement Requirements

The MLS student must be able to:

- Move freely and safely about a laboratory.
- Reach laboratory bench-tops and shelves, patients lying in hospital beds or patients seated in specimen collection furniture.
- Travel to numerous clinical laboratory sites for practical experience.
- Perform moderately taxing continuous physical work, often requiring prolonged sitting, over several hours.
- Maneuver phlebotomy and culture acquisition equipment to safely collect valid laboratory specimens from patients.
- Control laboratory equipment (i.e., pipettes, inoculating loops, test tubes) and adjust instruments to perform laboratory procedures.
- Use an electronic keyboard to operate laboratory instruments and to calculate, record, evaluate, and transmit laboratory information.
- Perform fine hand manipulations with dexterity.

**Communication Requirements**

The MLS student must be able to:

- Read and comprehend technical and professional materials.
- Follow verbal and written instructions in order to correctly and independently perform laboratory test procedures.
- Clearly instruct patients prior to specimen collection.
- Effectively, confidentially and sensitively converse with patients regarding laboratory tests.
- Communicate with faculty members, fellow students, staff, and other health care professionals verbally and in a recorded format.
- Independently prepare papers, prepare laboratory reports, and take paper, computer, and laboratory practical examinations.

**Behavioral Requirements**

The MLS student must:

- Be able to manage the use of time and be able to systematize actions in order to complete professional and technical tasks within realistic constraints.
- Possess the emotional health necessary to effectively employ intellect and exercise appropriate judgment.
- Be able to provide professional and technical services while experiencing the stresses of task-related uncertainty and a distracting environment.
- Be flexible and creative and adapt to professional and technical change.
- Recognize potentially hazardous materials, equipment, and situation and proceed safely in order to minimize risk of injury to patients, self, and nearby individuals.
- Adapt to working with unpleasant biologicals.
- Support and promote the activities of fellow students and of health care professionals.
- Realize that the promotion of peers helps furnish a team approach to learning, task completion, problem solving and patient care.
- Be honest, compassionate, ethical and responsible.

**Request for Accommodation**

All students are held to the same academic and technical standards. Applicants/students with disabilities seeking accommodation must discuss their disability and accommodation needs with the University Disability Support Services (udss@uwo.edu or (307) 766-6189; TTY: (307) 766-3073). If appropriate and upon request and registration of the applicant, a reasonable accommodation will be made consistent with University of Wyoming guidelines.

**Requirements for Graduation**

The program requires 120 credit hours total, with 60 credit hours obtained in the Junior/Senior years to graduate. This includes 36 credits in upper division major requirements, with a supplement of 12 upper division elective credit hours. 30 UD credits must be taken from UW to earn a B.S. from UW. A minimum University of Wyoming GPA of 2.0 and a C (2.0 or above) in all courses is required for graduation.

**Sample Four Year Plan of Study**

**(Lower Division Courses are available through an articulation agreement with Casper College)**

<b>FRESHMAN YEAR: Fall</b>		<b>Hrs.</b>
MATH	1400 (USP Q)	4
MLTK	1500	3
MOLB	2210	4
CMAP	1505	1
SOC 1000 or ANTH 1200 (USP H)		3
<b>Total Hrs.</b>		<b>15</b>

<b>FRESHMAN YEAR: Spring</b>		<b>Hrs.</b>
ENGL	1010 (USP COM1)	3
MLTK	1600	3
MLTK	1700	2
MLTK	2600	2
BIOL	1010 (USP PN)	4
GE course		3
<b>Total Hrs.</b>		<b>17</b>

<b>FRESHMAN YEAR: Summer</b>		<b>Hrs.</b>
CHEM	1025 (USP PN)	3
CHEM	1028	1
MLTK	1800	3
MLTK	1970	2
<b>Total Hrs.</b>		<b>9</b>

<b>SOPHOMORE YEAR: Fall</b>		<b>Hrs.</b>
ENGL	1020 (USP COM2)	3
MLTK	2500	3
MLTK	2650	2
MLTK	2700	4
POLS	1000 (USP V)	3
<b>Total Hrs.</b>		<b>15</b>

<b>SOPHOMORE YEAR: Spring</b>		<b>Hrs.</b>
MLTK	2971	2
MLTK	2972	2
MLTK	2973	2
MLTK	2974	2
MLTK	2976	1
MLTK	2977	1
MLTK	2800	4
PEAC	XXXX	1
<b>Total Hrs.</b>		<b>15</b>

<b>JUNIOR YEAR: Fall</b>		<b>Hrs.</b>
CHEM	1030 (USP PN)	4
CHEM	2300	4
LIFE	3050	4
LIFE	3600	4
<b>Total Hrs.</b>		<b>16</b>

<b>JUNIOR YEAR: Spring</b>		<b>Hrs.</b>
STAT	2050 (USP Q)	4
MOLB	3000	3
LIFE	3500	3
MOLB	3610	4
<b>Total Hrs.</b>		<b>14</b>

<b>SENIOR YEAR: Fall</b>		<b>Hrs.</b>
MLSK	4840	1
MLSK	4850	2
MLSK	4860 (USP COM3)	3
Upper Division Electives		9
<b>Total Hrs.</b>		<b>15</b>

<b>SENIOR YEAR: Spring</b>		<b>Hrs.</b>
MLSK	4981	3
MLSK	4982	3
MLSK	4983	3
MLSK	4984	3
Upper Division Electives		3
<b>Total Hrs.</b>		<b>15</b>

**Total 146**

**Upper Division Elective Credit Hours**

12 upper division elective credit hours must be completed in the student's junior or senior year. These credits must be 3000 and above, and achieved through online outreach or on campus courses. A list of courses that are acceptable to fulfil this requirement can be made available to the student. If a course is in question, it is highly suggested to the student to contact the UW-C advising department or the MLS program director for requirement fulfillment confirmation.

**Field Practicum and Laboratory Sessions**

The final semester of the student's senior year is comprised of didactic material being delivered in an online hybrid manner, supplemented with on campus lab sessions at the UW-Casper campus. These lab sessions will

be accompanied by an onsite practicum at a clinical affiliate, consisting of 24-48 hours of advanced clinical techniques for each advanced practicum course. It will be the students' responsibility for all travel and housing costs associated with the advanced clinical practicum courses.

### Probation

Students that do not meet the minimum grade requirements stated above for MLSK course work will be placed on probation. In this period of time, students will be allowed to continue in the program under supervision, but will submit a petition which is an individualized plan of study for the next semester that is developed by the student in agreement with and signed by an academic advisor. All completed MLSK courses that fail to meet minimum grade requirements (C or 2.0 or better) must be repeated by the student. Students shall not be allowed to progress to the final semester until all courses in the previous semesters are successfully completed and a GPA of 2.0 is obtained.

## Medical Laboratory Science (MLSK)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

### 4840. Laboratory Education Methodology.

1. This course provides an overview of education methodology and issues related to roles as educators in the clinical laboratory profession. Course topics and assignments include pedagogy, curriculum design, assessment and accreditation. Major educational responsibilities for clinical laboratory professionals relating to continuing education, competency assurance, certification and licensure will be addressed. *Prerequisite:* Medical Laboratory Technician (ASCP) certification or completion of an associate of science degree in medical laboratory technician within 5 years.

**4850. Clinical Research Design. 2.** A course in research design methods commonly used in clinical research. Emphasis is on research design, process, measurement, regulatory issues, and ethics, as used by investigators. The focus is to equip students with knowledge and skills necessary to critically examine professional literature, methodology and ethical considerations that influence research design. *Prerequisite:* Medical Laboratory Technician (ASCP) certification or completion of an associate of science degree in medical laboratory technician within 5 years.

### 4860. Laboratory Management. 3.

**[(none)♦COM3]** This course introduces students to laboratory management systems, testing, reimbursement, accrediting/regulatory issues, finances, information systems, QA/QC improvement and supervisory roles in the clinical laboratory. Emphasis is on management and communication skills needed to work successfully as entry-level professionals in a health care setting. *Prerequisite:* Medical Laboratory Technician (ASCP) certification or completion of an associate of science degree in medical laboratory technician within 5 years.

### 4981. Advanced Clinical Practicum - Hematology. 3.

Advanced hematology principles and techniques prepare students for practice in the clinical laboratory. Topics include leukopoiesis, FAB Leukemia classification, leukocyte dyscrasias, lymphomas, hemostasis and coagulopathies. Laboratory will focus on abnormal smears, cytochemistry, normal and leukemic bone marrow evaluations, and coagulation mixing studies and factor assays related to clinical disease states. *Prerequisite:* Medical Laboratory Technician (ASCP) certification or completion of an associate of science degree in medical laboratory technician within 5 years.

### 4982. Advanced Clinical Practicum - Molecular. 3.

Principles of molecular technology used in clinical laboratories. Laboratory experiences include cytogenetics, nucleic acid extraction, hybridization, detection, amplification, sequencing, microarrays, and in-situ hybridization. Emphasis is on the areas of the clinical laboratory that use molecular techniques related to genetics, oncology, infectious disease, and identity testing for forensic and transplant purposes. *Prerequisite:* Medical Laboratory Technician (ASCP) certification or completion of an associate of science degree in medical laboratory technician within 5 years.

### 4983. Advanced Clinical Practicum - Immunohematology. 3.

Principles of immunology theory, blood group systems, genetics, and immunohematology techniques. Procedures including evaluation of blood samples, pre-transfusion compatibility testing, and transfusion reactions are studied. Serologic testing and problem-solving in antibody identification and complex procedures are stressed. Laboratory emphasizes modern practices, resolution of compatibility problems and advanced antibody identification methods. *Prerequisite:* Medical Laboratory Technician (ASCP) certification or completion of an associate of science degree in medical laboratory technician within 5 years.

## Division of Social Work

Health Sciences Building, 766-6112

FAX: (307) 766-6839

Web site: [www.uwyo.edu/socialwork](http://www.uwyo.edu/socialwork)

Director: Donna Leigh Bliss, Ph.D.

### Professor:

**MONA C.S. SCHATZ**, B.A. Metropolitan State College 1976; M.S.W. University of Denver 1979; D.S.W. University of Pennsylvania 1985; Professor of Social Work 2006.

### Associate Professors:

**DONNA LEIGH BLISS**, B.A. University of Maryland College Park 1989; M.S.W. University of Maryland Baltimore 1991; Ph.D. 2005; Associate Professor of Social Work 2013.

**DIANE A. KEMPSON**, B.A. Columbia College 1968; M.S.W. Florida State University 1970; Ph.D. University of South Carolina 1998; Associate Professor of Social Work 2010.

### Assistant Professors:

**NEELY MAHAPATRA**, B.Sc. Utkal University, India 1991; M.Sc. 1993; M.S.S.W. University of Texas-Austin 2003; Ph.D. 2008; Assistant Professor of Social Work 2009.

**VALERIE THOMPSON-EBANKS**, B.Sc. University of the West Indies 2002; M.S.W. 2007; Ph.D. Colorado State University 2012; Assistant Professor of Social Work 2012.

### Associate Lecturer:

**ELIZABETH DOLE-IZZO**, B.S. Colorado State University 1996; M.S.W. 2002; Associate Lecturer of Social Work 2015.

**CAROLYN HANEY**, B.A. Chadron State College 1993; M.S.W. University of Wyoming 2000; Associate Lecturer of Social Work 2012.

### Assistant Lecturer:

**KARI VELZKE**, B.S. Minnesota State University Mankato 2000; M.S.W. 2010; Assistant Lecturer of Social Work 2014.

Social workers are uniquely qualified to help people in their own environments by looking at different aspects of their lives and cultures. We work to ensure the client's personal well-being, prevent crises, counsel individuals, support families, and strengthen communities. We make sure people get the help they need, with the best resources available.

For more than 100 years, social workers have cared for people in every stage of life. Social workers help others overcome life's most difficult challenges and manage the troubles of everyday living, including the troubles that exist due to poverty, stress, addiction, abuse, unemployment, mental illness, family change, and social violence.



The Division of Social Work prepares students for entry-level generalist social work practice. Two locations offer the social work program: the Laramie campus and the University of Wyoming-Casper campus. Graduates receive a Bachelor of Social Work (BSW) and are prepared to work as generalist social work practitioners with individuals, groups, families, organizations, communities, and institutions to achieve more effective and efficient social functioning.

Our program is accredited by the Council on Social Work Education. The curriculum is designed to help students acquire important knowledge and skills in the areas of values and ethics, diversity, social and economic justice, human behavior and the social environment, social welfare policy and services, social work practice, and research. A competency-based curriculum prepares students to meet an “initial level” of competence in 10 core areas (CSWE, 2008). Students also select elective courses in areas such as aging, child and adolescent services, health and mental health, and disability services. The program culminates in a 450-hour supervised field practicum, which allows students to work as social workers in one of Wyoming’s many human service agencies.

### Social Work Major

Social work is a professional degree program. Prior to admission to the professional degree program, declared social work majors are considered Tracking Majors. Typically students apply to the professional degree program the spring semester of their sophomore year. Acceptance to Admitted Major (professional degree program) is competitive and requires an application. Please see application requirements on the Division of Social Work website. Students accepted into the professional degree program are expected to complete their degree in a timely manner. Students who have not completed social work classes for one year or more must reapply for Admitted Major and submit a plan for readiness to continue in the social work degree program. A plan may include, but is not limited to, repeating or auditing a course taken at an earlier point in the student’s academic experience, completing an independent study that may provide updated social work content for the student, demonstrating knowledge or practice skills. Readmission is not guaranteed.

### Criteria for Admission as an Admitted Major

The admissions process is competitive. Students must meet the following minimum criteria to be considered for Admitted Major status.

1. Students must earn a minimum grade point average (GPA) of 2.50 on all UW course work as well as all course work transferred into the University of Wyoming from other academic institutions.
2. Complete the following prerequisites:
  - a. SOC 1000
  - b. PSYC 1000
  - c. POLS 1000
  - d. SOWK 2000
  - e. Human Biology (KIN/ZOO 2040, LIFE 2050, or PSYC 2080)
  - f. STAT 2070
  - g. ECON 1010
3. Students must earn a grade of C or higher in all SOWK prerequisite classes.
4. Students must adhere to the UW Student Code of Conduct and the NASW Code of Ethics.
5. Students cannot exhibit behavior that will impinge on the student’s present or future ability to fulfill professional responsibilities as a social work professional.
6. All students seeking admission to programs in the College of Health Sciences are required to undergo a background check as specified by college policy. Criminal convictions may result in rejection of the candidate for admission to Admitted Major.
7. Students must submit an application and an application fee. (See UW Fee Book)
8. Applicants to the social work program cannot receive credit for life experience.

### Requirements for Admitted Majors

Once admitted, social work students must:

1. Achieve a C or better in all social work prerequisites.
2. Achieve a C or better in all social work courses, including six hours of required social work electives.
3. Social work classes are offered and must be completed in sequential order.
4. Maintain a 2.5 or above GPA overall every semester after admittance to Admitted Major.

5. Maintain a 2.5 or above GPA overall in all social work course work every semester after admittance to Admitted Major.
6. Registration is restricted and students must meet with their advisor each semester for enrollment.
7. Complete SOWK 4990 with a satisfactory.
8. Students must adhere to the UW Student Code of Conduct and the NASW Code of Ethics.

Individuals failing to meet any of the above requirements will be reviewed by faculty and one of the following actions may be taken: remediation, probation, sanction, and/or dismissal from the program. Because many social work courses have prerequisite requirements, receiving a grade lower than a C in a social work course may prevent the individual from moving forward in the social work program.

### Field Practicum

All students complete a 450-hour (10 credit hours) field practicum experience in a community-based social agency or social program. Field practicum sites exist throughout the state of Wyoming and students may be placed outside Laramie. Students apply for this program the semester before their actual placement. Students must complete a Field Placement Application and meet with the Field Coordinator to determine a field location (please review BSW Field Practicum Manual). Background checks and drug screenings may be required by some agencies even though the College of Health Sciences has received a background check during admission to the major.

For the practicum, the grade of U is interpreted as performing below expectations and will not be considered satisfactory completion of the practicum, hence of the BSW program. Based on input from the student, the field instructor, and the faculty liaison during the field evaluation, the field coordinator will determine what remediation would be required. The plan will clarify course objectives and professional skills upon which the student needs to improve. A student wishing to continue in the program would need to reapply for a field placement. Upon approval of the request for placement by the field committee, the student may then repeat the practicum experience. Consistent with University policy, the most recent grade would be the grade calculated into the GPA. The grade of U is interpreted as not meeting minimal requirements of the course; failure to complete the minimum clock hours in the field placement; failure to complete written assignments in a satisfactory

manner; violation of one or more of the tenets of the NASW Code of Ethics (see Appendix B and Termination of Practicum section in the practicum manual); and/or failure to withdraw formally or to terminate the course. A student receiving an U in the practicum will be automatically dismissed from the BSW program with no opportunity to reapply or re-enter. Grades and dismissals may be appealed. (See most current BSW Student Handbook for appeal procedures.)

**Requirements for Graduation**

The program requires 120 credit hours to graduate. Students must have completed all social work requirements, 42 upper-division hours, maintain a 2.5 GPA overall, a 2.5 GPA in social work coursework, and have achieved a grade of C or better in all social work courses. Courses must be taken for a letter grade unless offered for S/U only. USP H and PN courses must be taken outside the major subject, but can be cross listed with the major.

**Four Year Plan of Study**

<b>FRESHMAN YEAR: Fall</b>		<b>Hrs.</b>
PSYC 1000 (H)	.....	3
MATH 1000 (Q)	.....	3
ENGL 1010 (COM1)	.....	3
USP First-Year Seminar (FYS)	.....	3
USP Human Culture (H)	.....	3
SPAN 1010 recommended		
<b>Total Hrs.</b>		<b>15</b>

<b>FRESHMAN YEAR: Spring</b>		<b>Hrs.</b>
LIFE 1003 (PN)	.....	4
POLS 1000 (V)	.....	3
Elective*	.....	3
WMST 1080 recommended		
Elective*	.....	3
SPAN 1020 recommended		
SOC 1000 (H)	.....	3
<b>Total Hrs.</b>		<b>16</b>

<b>SOPHOMORE YEAR: Fall</b>		<b>Hrs.</b>
SOWK 2000	.....	3
STAT 2070 (Q)	.....	4
PSYC 2080	.....	3
USP Communication II (COM2)	.....	3
USP Physical and Natural World (PN)	.....	3
<b>Total Hrs.</b>		<b>16</b>

<b>SOPHOMORE YEAR: Spring</b>		<b>Hrs.</b>
ECON 1010 (H)	.....	3
Elective*	.....	3
RELI 1000 recommended		
Elective*	.....	3
WIND 2100 recommended		
Elective*	.....	3
SOC 2350 recommended		
Elective*	.....	3
PSYC 2330 recommended		
<b>Total Hrs.</b>		<b>15</b>

**Application for Admitted Major submitted**  
**(acceptance as Admitted Major needed to proceed in program)**

<b>JUNIOR YEAR: Fall</b>		<b>Hrs.</b>
SOWK 3530	.....	3
SOWK 3630	.....	3
SOWK 3645	.....	3
SOWK 4060	.....	3
Elective*	.....	3
FCSC 2131 recommended		
<b>Total Hrs.</b>		<b>15</b>

<b>JUNIOR YEAR: Spring</b>		<b>Hrs.</b>
SOWK 3540	.....	3
SOWK 3640	.....	3
SOWK 3650	.....	3
SOWK 4850	.....	3
Elective*	.....	3
FCSC 3110 recommended		
<b>Total Hrs.</b>		<b>15</b>

<b>SENIOR YEAR: Fall</b>		<b>Hrs.</b>
SOWK 4560	.....	3
SOWK 4990	.....	5
SOWK 4991	.....	2
SOWK Elective*	.....	3
Elective*	.....	3
FCSC 4112 recommended		
<b>Total Hrs.</b>		<b>16</b>

<b>SENIOR YEAR: Spring</b>		<b>Hrs.</b>
SOWK 4570 (COM3)	.....	3
SOWK 4990	.....	5
SOWK 4992	.....	2
SOWK elective*	.....	3
<b>Total Hrs.</b>		<b>13</b>
<b>Total</b>		<b>121</b>

\*Work with your advisor to determine the best free electives for your particular career path. Consider adding a minor to your degree.

**Graduate Study**

The Master of Social Work (MSW) is designed to prepare graduate students for advanced level social work practice and leadership positions in rural human service organizations. The MSW program is accredited by the Council on Social Work Education. The

Master of Social Work program is focused on an advanced generalist and rural social work focus that relies on the problem-solving method, and is based on the values, knowledge, and skills of the profession. Part-time and full-time options are available.

**Certificate Programs**

School Social Work

See Web site for details and course requirements.

**Graduate Admissions Requirements**

The Division of Social Work's Graduate Admissions Committee bases its decisions primarily on the evaluation of previous undergraduate and graduate work, recommendations, experience in human services (paid, volunteer, research, and internship), the applicant's personal statement, an academic essay, and optional supporting materials.

**Requirements for the Standard MSW Program**

- A baccalaureate degree from a nationally accredited college or university that reflects a broad liberal arts preparation. This consists of having completed at least 21 credit hours in social and behavioral sciences and 6 credit hours in natural sciences, humanities, visual and performing arts, and quantitative reasoning;
- A human biology course, receiving a grade of C or better;
- A statistics course, receiving a grade of C or better;
- An undergraduate cumulative grade point average (GPA) of 3.0 or above on a 4-point scale;
- Applicants are encouraged to have engaged in human services or social services work as a volunteer or paid employee for at least 600 hours. These hours must be documented on a resume.

**Requirements for the Advanced Standing MSW Program**

- A bachelor's degree in Social Work from a Council on Social Work Education accredited social work program;
- An undergraduate social work GPA of 3.25 or above;
- An overall undergraduate GPA of 3.0 or above;
- Received a B or better and/or a Satisfactory grade in BSW Field Education Practicum;

- Applicants are encouraged to have engaged in human services or social services work as a volunteer or paid employee for at least 1000 hours (BSW internship hours can apply to this total). These hours must be documented on a resume.

\*International students have special requirements for admission to UW. All are encouraged to contact the International Programs office for details before applying.

### All Applicants

All applicants will be evaluated on the their:

- Intellectual and personal qualities essential to the successful practice of social work, such as sensitivity and responsiveness in relationships, concern for the needs of others, adaptability, good judgment, creativity and integrity;
- Commitment to social justice and equality;
- Written and verbal communication skills;
- References and
- The compatibility of career goals with the MSW program's advanced generalist perspective.

All applicants meeting minimum criteria will be considered for admission interviews. Admitted applicants will be required to complete a criminal background check through the College of Health Sciences.

### Program Specific Degree Requirements

All students entering the MSW program do so in the summer semester of their first year, completing introductory and/or bridge courses as needed for their specific program phase. The MSW program is divided into two phases: foundation and advanced standing. The foundation year of the MSW program prepares students without a BSW degree for the advanced generalist concentration in the second year. Students who have already obtained their BSW degree may apply for Advanced Standing in the MSW program. These students complete only the second year courses.

### Master of Social Work Plan A

Students complete all SOWK required courses except SOWK 5755. Plan A students register for SOWK 5960 Thesis Research. Students registering for the Plan A option are required to carry out original research. Thesis proposal defense, thesis implementation, and final defense are required. Plan A students may write a monograph fully detailing their research or a publishable peer-refereed journal

article, determined in consultation with the student's Research Chair and in accordance with the UW Thesis requirements.

The thesis requires a minimum of 4 credit hours, usually taken as 2 credits in the fall semester and 2 credits in the spring of advanced year.

### Master of Social Work Plan B

Students complete all required SOWK courses. Plan B students register for SOWK 5755 (minimum 2 credits) course. A final written paper and oral defense are required.

## Social Work (SOWK)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB↔Q]).

**1001. Intellectual Community in Social Work. 3. [I,L↔(none)]** Provides a theoretical examination of the mechanisms of oppression. Content focuses on individual, group, and societal functioning. Also provides an introduction to the profession of social work and a foundation in information literacy.

**1002. Intellectual Community: The Social Work Profession. 3. [I,L↔(none)]** Provides an introduction to the purpose and philosophy of social work. Content focuses on various roles that social workers play and the ethical dilemmas they encounter. Also provides an introduction to developing research questions in social work and the problem solving method.

**1050. Topics: Social Work. 1-6.** Various topics in social work.

**1900. Women and Leadership. 3. [O,L↔(none)]** Students examine theoretical, historical, and cultural aspects of leadership, values in leadership, gender differences in leadership styles, and practical applications of leadership skills through oral communication and information literacy. Individual and collaborative work is expected. Cross listed with WMST 1900. *Prerequisite:* one course in women's studies.

**2000 [3000]. Introduction to Social Work. 3.** Introduces social work and social welfare through an overview of the history, philosophy, ethics, values, methods, and fields of practice to generalist social work.

**3530. Human Behavior and the Social Environment I. 3.** Covers theories and knowledge of human bio-psycho-social-spiritual development and social interactions within a systems framework. Introduces theories of individuals and families and their development. Paradigms of culture, marginalization and oppression are examined. *Prerequisite:* admitted social work major status.

**3540. Human Behavior and Social Environment II. 3.** Covers theories and knowledge of human bio-psycho-social-spiritual development and social interactions within a systems framework, with a focus on groups, communities, organizations and institutions. *Prerequisites:* SOWK 3530 with a C or better and admitted social work major status.

**3630. Generalist Social Work Practice I, Individual and Families. 3.** Introduces generalist social work practice at all systems' levels, with focus on individuals and families. It covers the nature of social work practice, theoretical perspectives, ethics and values, engagement, assessment, intervention and evaluation processes and skills. *Prerequisite:* admitted social work major status.

**3640. Generalist Social Work Practice II, Groups. 3.** Focuses on group work within the generalist social work perspective, covering theoretical perspectives, ethics and values, and engagement, assessment, intervention, and evaluation skills applied to task and treatment groups. *Prerequisites:* SOWK 3630 and 3530 with a C or better and admitted major status.

**3645. Ethical Social Work Practice. 3.** Focuses on the ethical principles that undergird the practice of social work, addresses how to practice ethically, and explores the process of ethical decision-making. Social work practice with various client systems will be considered, as well as practice in varied settings. *Prerequisite:* admitted social work major status.

**3650. Generalist Social Work Practice III; Communities and Organizations. 3.** Teaches engagement, assessment, intervention and evaluation with organizations, communities and institutions within the generalist social work perspective. *Prerequisites:* SOWK 3630 with a C or better; SOWK 3540 pre or concurrent; admitted social work major status.

**4020. Disability Studies Theory and Practice. 3. [CS↔(none)]** Explores the interdisciplinary nature of disability studies, which investigates the embodied experience of disability as well as culturally constructed meanings and belief systems that function to stigmatize, oppress, liberate, or otherwise impact people living with illness and disability. Students will develop interdisciplinary research questions, paying particular attention to sociological realities. Dual listed with SOWK 5020; cross listed with WIND 4020. *Prerequisite:* WIND 2100 or WB.

**4030. Social Work and Mental Health. 3.** Presents overview of mental health services, policy, nosologies, history and interventions. Information examined in light of social work values and ethics, concern for populations-at-risk, and social and economic justice. Issues

of diversity in mental health arena considered throughout. Dual listed with SOWK 5030.

*Prerequisite:* advanced major in social work.

**4060. Diversity and Difference in Social Work Practice. 3. [D♦(none)]** Examines social works' roles and issues related to human diversity. Social work values and ethics and social and economic justice are explored throughout. *Prerequisite:* admitted social work major status.

**4083. Social Work and Health Care. 3.** Identifies and addresses social work issues related to health, such as medical social work, public health, and health promotion. Dual listed with SOWK 5083. *Prerequisites:* SOWK 3630 and Admitted Major status; a WB course and junior standing for non-social work majors.

**4084. Professional Social Work Practice: Alcohol and Other Drugs. 3.** Examines alcohol and substance abuse and social work's role in varied practice settings. Issues explored include medical considerations in alcohol abuse, social and familial challenges, as well as social work values and ethics, and concern for populations-at-risk. Dual listed with SOWK 5084. *Prerequisites:* SOWK 3630 and Admitted Major status; a WB course and junior standing for non-social work majors.

**4460. Social Welfare Policies and Issues. 3.** Analyzes issues, programs, and policies in social work and social welfare. *Prerequisites:* ECON 1010 with a C or better.

**4480. Introduction to Aging Services. 3.** Surveys issues in aging and social work's role, status and function in the field of gerontology. *Prerequisite:* SOWK 2000 or consent of instructor.

**4550 [3550]. Child Welfare Services. 3.** Examines issues of child and family welfare in the context of national, state, and local policy and practice. Social and economic justice are examined as they relate to interventions with children and families. Dual listed with SOWK 5550. *Prerequisites:* SOWK 2000; SOWK 3530.

**4560. Social Work Research. 3.** Introduces social work research and practice evaluation. Prepares students to use research in practice. *Prerequisites:* STAT 2050 or 2070 with a grade of C or better and admitted social work major status.

**4570. Research-Informed Practice. 3. [WC♦COM3]** Learn about and engage in methods of research applicable to their social work practice. Competence in methods such as single system design and program evaluation will be assessed in this course. *Prerequisites:* SOWK 4560 with a C or better and admitted social work major status.

**4780. Seminar: \_\_\_\_\_, 1-9 (Max. 15).** Consideration of special topics of current interest in social work. May be repeated for a maximum of 15 hours credit when the seminar topic is different. *Prerequisite:* advanced major status; or consent of instructor and junior standing for non-social work majors.

**4850. Human Rights, Social Justice and Social Policy. 3.** Examines human rights, social welfare policy, and social, political and economic justice, as well as systems that oppress and create injustice, both in the US and internationally. A focus of the course will be the analysis of social welfare policy as it affects social justice issues. *Prerequisites:* SOWK 4060, ECON 1010, and admitted social work major status.

**4881. International Social Welfare and Social Development. 3. [G♦(none)]** Examines the basic framework of social welfare analysis and social development programming in the international arena, employing a multinational comparative analysis approach to explore the wide array of responses to social need across the globe. Students employ multinational comparative analyses to an area of social concern. Dual listed with SOWK 5881; cross listed with INST 4881. *Prerequisite:* POLS 1000; ECON 1010 recommended.

**4960. Service-Learning in Psychology. 3.** Experience applied aspects of psychology in real world settings through volunteering. Recent research and other materials preparing students for their service will be discussed in class. After the volunteering experience, the students will prepare an academic paper integrating their practical experience with research and theory learned in class. Cross listed with PSYC 4960. *Prerequisites:* PSYC 1000 and consent of instructor required in advance.

**4980. Independent Study. 1-3 (Max. 6).** Consideration of topics of current social work interest in consultation with a member of the faculty. *Prerequisites:* advanced major status and consent of instructor.

**4990. Social Work Practicum. 5-10 (Max. 10).** Represents the culmination of preparation for entry level generalist social work practice. Supervised practice in the knowledge, values and skills learned in the classroom. Offered S/U only. *Prerequisites:* SOWK 3640, 3650 and application to the field program.

**4991. Social Work Competency Assessment I. 2.** Develops and supports student integration of classroom and field practicum experiences in a final demonstration of competencies for the beginning practitioner. *Prerequisite:* concurrent enrollment in SOWK 4990.

**4992. BSW Field Seminar II. 2.** Develops and supports student integration of classroom and field practicum experiences in a final demonstration of competencies for the beginning practitioner. *Prerequisite:* taken concurrently with SOWK 4990.

**5000. Topics: Social Work. 1-3 (Max. 15).** Various advanced topics in social work will be presented. May be repeated for a maximum of 15 hours when offered for different topics. *Prerequisite:* bachelor's degree; 18 hours in socio/behavioral sciences preferred.

**5020. Disability Studies Theory and Practice. 3.** Explores the interdisciplinary nature of disability studies, which investigates the embodied experience of disability as well as culturally constructed meanings and belief systems that function to stigmatize, oppress, liberate, or otherwise impact people living with illness and disability. Students will develop interdisciplinary research questions, paying particular attention to sociological realities. Dual listed with SOWK 4020; cross listed with WIND 5020. *Prerequisite:* WIND 2100 or WB.

**5030. Social Work and Mental Health. 3.** Explores mental health services, policies, neologies, history, and interventions. Information examined in light of social work values and ethics, concerns for populations-at-risk, and social and economic justice. Issues of diversity in mental health areas considered throughout. Dual listed with SOWK 4030. *Prerequisite:* graduate standing.

**5081. Assessment and The DSM. 3.** Through a psychiatric social work lens students will become familiar with the process of conducting a diagnostic interview, writing psychiatric assessment including a mental status exam and formulating a diagnosis using the Diagnostic and Statistical Manual of Mental Disorders. This course assumes some knowledge of mental health and mental illness. *Prerequisite:* graduate standing.

**5082. Women and Mental Health in Context. 3.** Examines the context of women's lives that contribute to actual or perceived emotional vulnerability and psychiatric diagnoses. Priority will be shifted from individual clinical pathology of women to a perspective of societal and patriarchal oppression. *Prerequisites:* graduate standing or consent of instructor.

**5083. Social Work and Health Care. 3.** Identifies and addresses social work issues related to health, such as medical social work, public health, and health promotion. Dual listed with SOWK 4083. *Prerequisites:* SOWK 3630 and Admitted Major status; a WB course and junior standing for non-social work majors.

**5084. Professional Social Work Practice: Alcohol and Other Drugs. 3.** Examines alcohol and substance abuse and social work's role in varied practice settings. Issues explored include medical considerations in alcohol abuse, social and familial challenges, as well as social work values and ethics, and concern for populations-at-risk. Dual listed with SOWK 4084. *Prerequisites:* SOWK 3630 and Admitted Major status; a WB course and junior standing for non-social work majors.

**5100. Principles and Philosophy of Social Work. 3.** Explores the history, traditions, ethics, purpose, philosophy, and knowledge base of the social work profession. Introduces the 10 core competencies of the MSW curriculum and the generalist social work perspective in rural settings using the problem-solving approach. *Prerequisite:* admission into the MSW program.

**5110. Social Policy Analysis. 3.** Explores the theory, history, structure and impact of social welfare policy on individuals, families, groups, organizations and communities. Particular attention paid to the analysis and development of policy, programs, and services related to social issues on a national, state, and local level. *Prerequisite:* admission into the MSW program and have either completed SOWK 5100 or take SOWK 5110 and 5100 concurrently.

**5115. Social Welfare Policy: Human Rights and Social Justice. 3.** Examines human rights and social and economic justice from a social work perspective, as well as systems that oppress and create injustice in the US and internationally. *Prerequisite:* admission to the MSW program.

**5120. MSW Foundation Field Seminar I. 1.** Develops and supports student integration of classroom and field practicum experiences in a seminar-style discussion of core competencies for the foundation year MSW student. *Prerequisites:* taken concurrently with SOWK 5450.

**5121. MSW Foundation Field Seminar II. 1.** Develops and supports student integration of classroom and field practicum experiences in the 2nd seminar-style discussion course of core competence for the foundation year MSW student. *Prerequisite:* taken concurrently with SOWK 5460.

**5200. Human Behavior and the Social Environment I. 3.** A theoretical examination of human behavior and the social environment, focusing on individuals, families and small groups in the context of human life cycle development. Emphasizes issues of human diversity and social and economic justice in the context of the environment. *Prerequisites:* admission into the MSW program and either completion of SOWK 5100 or concurrent enrollment.

**5210. Human Behavior and the Social Environment II. 3.** A theoretical examination of human behavior in the social environment, focusing on groups, communities, organizations and institutions. Emphasizes issues of human diversity and social economic justice. *Prerequisite:* SOWK 5200.

**5300. Generalist Social Work Practice I. 3.** Applies social work skills, values, and knowledge to a range of human service settings in a rural state. Emphasis is on generalist practice models and skills within a systems' framework. Covers engagement, assessment, intervention, and evaluation across all system levels. Addresses ethics and diversity throughout the course. *Prerequisite:* admission into the MSW program.

**5310. Generalist Social Work Practice II. 3.** Applies social work skills, values and knowledge to the engagement, assessment, intervention and evaluation processes with groups, organizations and communities. Emphasis on ethics and diversity in practice. *Prerequisite:* admission into the MSW program; must have completed SOWK 5300.

**5400. Social Work Generalist Research Methods. 3.** Covers design, implementation and interpretation of research in social work practice settings. Presents methods of program evaluation and practice research at all system levels using both quantitative and qualitative research methodologies. *Prerequisite:* admission into the MSW program.

**5450. Field Practicum I. 3.** Provides the opportunity for students to learn through experience the skills of entry-level generalist social work practice. The course consists of supervised practice, in a community service agency, of social work knowledge, values and skills learned in the classroom. *Prerequisites:* Students must have completed, or be concurrently enrolled in, SOWK 5100, SOWK 5200, SOWK 5300, and SOWK 5400.

**5460. Field Practicum II. 5-10 (Max. 10).** Provides the opportunity for students to learn through experience the skills of entry-level generalist social work practice. The course consists of supervised practice, in a community service agency, of social work knowledge, values and skills learned in the classroom. *Prerequisite:* SOWK 5450.

**5495. Social Work Research and Analysis. 3.** Designed for MSW advanced standing students to address research methods and analysis in the context of the generalist problem-solving approach. *Prerequisite:* admission to the MSW advanced standing program; concurrent enrollment in SOWK 5499.

**5499. Social Work Generalist Practice. 3.** Designed to prepare newly admitted advanced standing MSW students for advanced generalist practice. Covers, in depth, theoretical perspectives practice with individuals and families, ethics and values, the social work relationship, the problem-solving process, interviewing, intervention, and evaluation skills. Focus on evidence-based practice models will be addressed. *Prerequisite:* admission to the MSW advanced standing program; concurrent enrollment in SOWK 5495.

**5500. Advanced Policy: Advocacy and Social Action. 3.** Advanced generalist course builds on foundation and advanced year courses to prepare students to conduct comparative and advanced policy analysis and develop practice/advocacy components. Emphasis is given to policy practice issues that address economic and social justice, diversity, populations at risk, and ethics and values. *Prerequisite:* SOWK 5310 and SOWK 5115 or advanced standing.

**5550. Child Welfare Services. 3.** Examines issues of child and family welfare in the context of national, state, and local policy and practice. Social and economic justice are examined as they relate to interventions with children and families. Dual listed with SOWK 4550. *Prerequisites:* admission to advanced standing or SOWK 5100 and 5200.

**5600. Advanced Generalist Practice. 3.** Teaches advanced generalist practice theories and skills for work with individuals and families in the context of their environment. Engagement, assessment, intervention and evaluation skills will be assessed. Issues of ethics, rural practice, and diversity are addressed throughout the course. *Prerequisites:* SOWK 5300 and SOWK 5310 or advanced standing.

**5700. Advanced Theories and Practice with Children and Families. 3.** Advanced application of generalist problem-solving theories and skills in working with individuals and families in the context of their environment. Issues of ethics, rural practice, diversity, and evaluation of practice addressed throughout the course. *Prerequisite:* SOWK 5300 and SOWK 5310 or advanced standing.

**5705. Social Work Leadership in Supervision and Administration. 3.** Focuses on theories and skills for leadership, supervision, and administration in social work practice. Study of models and best practices, as well as skill development, will move the student toward leadership in supervision and management competence. *Prerequisites:* SOWK 5300 and SOWK 5310 or advanced standing.

**5720. Advanced Generalist Practice: Community and Rural Practice. 3.** Emphasizes advanced understanding and application of

models of rural community practice for promotion of well-being of client systems. Rurality and diversity/difference will be highlighted in this course. Models taught are appropriate to the social work profession, based on ethical considerations, cultural competency, and the strengths perspective. *Prerequisite:* SOWK 5310 or advanced standing.

**5750. Applied Research: Practice Evaluation. 3.** Focuses on the theory and use of small system design and program evaluation to evaluate one's social work practice. *Prerequisite:* SOWK 5400.

**5755. Practice Evaluation. 1-12 (Max. 12).** Students complete a non-thesis Plan B practice evaluation paper of quality, working with a committee structure. Must complete a minimum of two credit hours of 5755. *Prerequisite:* SOWK 5750; or advanced standing status and SOWK 5495; and instructor approval.

**5795. Rural Health Care Seminar. 3.** Examines social work and rural health and medical care for individuals, families and larger systems through policy, practice, and research. Includes a focus on the health and health care of older adults. *Prerequisites:* consent of instructor, graduate standing, participation in WYO HealthCARE Inter-disciplinary rural training grant.

**5800. Advanced Seminar in Social Work. 1-3 (Max. 15).** Consideration of special topics of current interest in social work. May be repeated for a maximum of 15 hours when the topic of the seminar is different. *Prerequisite:* graduate standing and consent of instructor.

**5810. Working with Children and Families in the Schools. 3.** Enhances knowledge, skills, and values of the generalist social worker serving children of diverse backgrounds and their families in the school and its environment, preparing the social worker for a leadership role in a rural school setting. *Prerequisite:* graduate standing.

**5820. School Social Work. 1.** Builds on the skills developed in SOWK 5810, advancing the knowledge, values and skills necessary for school social work. Students integrate observations of school social work settings with theory and practice, and personal evaluation, within this seminar. Public school law and policy are highlighted. *Prerequisite:* successful completion of SOWK 5810.

**5850. Advanced Field Practicum. 5-10 (Max. 10).** Provides advanced generalist social work practice experience in a community human service organization. Emphasizes core competencies and advanced generalist practice behaviors in social work ethics, values, theory, skills, practice and research in relation to so-

cial work with individuals, groups, families, organizations, and communities. *Prerequisites:* SOWK 5460 or Advanced Standing.

**5855. MSW Advanced Field Seminar I. 1.** Supports the advanced year MSW student's experience in the field practicum. This course is taken concurrently with SOWK 5850. *Prerequisite:* taken concurrently with SOWK 5850.

**5856. MSW Advanced Field Seminar II. 1-8 (Max. 8).** Supports the advanced year MSW student's experience in the field practicum. To be taken concurrently with SOWK 5850, spring semester. *Prerequisite:* SOWK 5855; concurrent with SOWK 5850.

**5881. International Social Welfare and Social Development. 3.** Examines the basic framework of social welfare analysis and social development programming in the international arena, employing a multinational comparative analysis approach to explore the wide array of responses to social need across the globe. Students employ multinational comparative analyses to an area of social concern. Dual listed with SOWK 4881; cross listed with INST 5881. *Prerequisite:* POLS 1000; ECON 1010 recommended.

**5887. American Indian Health. 3.** Studies the impact of federal policy on development of American Indian Health programs and the current status of American Indian health. *Prerequisite:* admission into graduate program.

**5920. Continuing Registration: On Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5940. Continuing Registration: Off Campus. 1-2 (Max. 16).** *Prerequisite:* advanced degree candidacy.

**5950. Interpersonal Counseling. 3.**

**5959. Enrichment Studies. 1-3 (Max. 99).** Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

**5960. Thesis Research. 1-12 (Max. 24).** Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program and instructor approval.

**5975. Independent Study. 1-3 (Max. 3).** In-depth exploration of a social work topic in consultation with a social work faculty member. *Prerequisite:* consent of instructor.

## Wyoming Institute for Disabilities (WIND)

147 Health Sciences Building, 766-2761

FAX: (307) 766-2763

Web site: [www.uwyo.edu/wind](http://www.uwyo.edu/wind)

Interim Director: Sandra Root-Elledge, M.A.

### Associate Professor:

**MICHELLE JARMAN**, B.A. University of California at Berkeley 1989; M.A. Northern Michigan University 2000; Ph.D. University of Illinois at Chicago 2006; Associate Professor of Disability Studies 2014, 2007.

### Academic Professional/Associate

#### Lecturer:

**SANDRA ROOT-ELLEDGE**, B.S. University of Wyoming 2001; M.A. 2003; Associate Lecturer 2009, 2004.

### Academic Professional/Assistant

#### Lecturers:

**CANYON HARDESTY**, B.S. University of Wyoming 2004; M.S. 2007; M.S. Creighton University 2011; Assistant Lecturer 2013.

**ALISON QUAGGIN HARKIN**, B.A. University of Toronto 1981; M.A. Athabasca University 2010; Assistant Lecturer 2014.

**DARCY REGAN**, B.S. Marquette University 2003; M.A. University of Northern Colorado 2007; Assistant Lecturer 2012.

The Wyoming Institute for Disabilities (WIND) is part of a national network of University Centers of Excellence in Developmental Disabilities Education, Research and Service (UCEDD). These centers provide a broad array of interdisciplinary academic, clinical, and research experiences of people with disabilities—particularly developmental disabilities. A wide variety of disciplines contribute to the study of disabilities.

WIND offers a Disability Studies Minor which investigates broad questions about the nature, meanings, and consequences of disability from interrelated social, historical, cultural, and political perspectives. The undergraduate minor in Disability Studies examines disability issues from multiple lenses, and draws specifically from social sciences, humanities, and health sciences.

Disability Studies has an ethical commitment to place the interests and voices of people with disabilities at the center of our curricula and training activities. The Disability Studies Minor balances theoretical exploration with practical application, and provides students

with a vibrant understanding of disability history, cultural representation, policy concerns, and current debates. Ultimately, students in the minor will work closely with people with disabilities, and gain the skills and perspectives to participate in unique disability research and advocacy.

## Disability Studies Minor Requirements:

### 18 credit hours total

All students in the minor are required to complete three WIND core courses, one WIND elective, and two external electives related to disability issues. External electives should be selected in consultation with a Disability Studies faculty adviser.

### Required Core Courses: 9 credits

- WIND 2100 Introduction to Disability Studies
- WIND 4020 Disability Studies Theory & Practice
- WIND 4500 Disability Studies Practicum

### WIND Elective: 3 credits selected from other WIND offerings

- WIND 2700 Gender and Disability
- WIND 2500 Topics in Disability Studies
- WIND 3160 Disability Civil Rights Movements
- WIND 4050 Independent Study
- WIND 4990 Topics in Disability Studies

### External Electives: 6 credits selected from other UW course offerings related to disability studies

(3 credits lower division & 3 credits upper division recommended)

Since an overarching goal of the minor is to examine disability as an essential element of human diversity, this program is designed to complement majors from across the university. For more detailed information, visit our website: [www.uwyo.edu/wind/academic\\_opp/](http://www.uwyo.edu/wind/academic_opp/). You may also contact faculty adviser Michelle Jarman at [mjarman@uwyo.edu](mailto:mjarman@uwyo.edu) or by phone at 766-5060, or visit the WIND office located in the Health Sciences Building, room 147.

### Disability Studies Program Goals:

These goals are conceptualized as the ultimate “ends” we hope to achieve in educating students and trainees in disability studies.

1. Promote full social integration by providing knowledge, awareness, and experience of inclusion and integration of people with disabilities as a foundational ethical principle of disability studies.
2. Position disability as a social justice issue by exposing students to historical and contemporary disability issues and providing learning opportunities to identify, articulate, and address inequities and injustices affecting the lives of people with disabilities.
3. Position disability as diversity by providing theoretical and practical contexts for thinking about disability as a component of human diversity, and providing students with tools to critically examine social and cultural constructions of disability.

## Wyoming Institute for Disabilities (WIND)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

### 2100. Introduction to Disability Studies.

**3. [CH,D♦♦H]** Provides students with an overview of the disability studies field. Students gain introductory knowledge about the disability studies perspective by examining the work of scholars from many academic backgrounds, which will facilitate students' understanding of the interdisciplinary nature of disability studies.

**2500. Topics in \_\_\_\_\_. 1-3 (max. 6).** Provides students with the opportunity to gain introductory knowledge by examining various topics in the field of Disability Studies. *Prerequisite:* Consent of instructor.

**2700. Gender and Disability. 3. [D♦♦H]** Disability studies draws upon critical theory to investigate disability as a discursive construction. Investigates how intersecting conceptions of disability and gender have shaped cultural meanings and the social positioning of specific groups, especially women with disabilities. Topics include non-normative embodiment, issues of representation and subjectivity, and the politics of health, sexuality, and care. Cross listed with WMST 2700.

**3160. Disability Civil Rights Movements. 3.** Provides a review and analysis of the various disability rights movements in the US and the social changes that have resulted from these movements. This includes the early roots following the French Revolution through the protest era of the 1960s to present efforts

to change federal policy. *Prerequisites:* past or concurrent enrollment in SOC 100 or WIND 2100.

**4020. Disability Studies Theory and Practice. 3. [CS♦♦(none)]** Explores the interdisciplinary nature of disability studies, which investigates the embodied experience of disability as well as culturally constructed meanings and belief systems that function to stigmatize, oppress, liberate, or otherwise impact people living with illness and disability. Students will develop interdisciplinary research questions, paying particular attention to sociological realities. Dual listed with WIND 5020; cross listed with SOWK 4020. *Prerequisite:* WIND 2100 or WB.

**4050. Independent Study. 1-3 (Max. 6).** Offers the advanced student the opportunity to pursue a topic of interest with the direction of an instructor in disability studies. Dual listed with WIND 5050. *Prerequisite:* WB and consent of instructor.

**4500. Practicum. 3.** Provides students practical experience in the field of Disability. Typically taken during a student's final semester in the Disability Studies Minor. *Prerequisites:* completion of WIND 2100, and WIND elective, WIND 4020 (or concurrent enrollment).

**4990. Topics in \_\_\_\_\_. 1-3 (max. 12).** Provides upper division/graduate students with the opportunity for critical analysis and in-depth examination of various topics in the field of Disability Studies. *Prerequisite:* consent of instructor.

**5020. Disability Studies Theory and Practice. 3.** Explores the interdisciplinary nature of disability studies, which investigates the embodied experience of disability as well as culturally constructed meanings and belief systems that function to stigmatize, oppress, liberate, or otherwise impact people living with illness and disability. Students will develop interdisciplinary research questions, paying particular attention to sociological realities. Dual listed with WIND 4020; cross listed with SOWK 5020. *Prerequisite:* WIND 2100 or WB.

**5050. Independent Study. 1-3 (Max. 6).** Offers the advanced student the opportunity to pursue a topic of interest with the direction of an instructor in disability studies. Dual listed with WIND 4050. *Prerequisite:* WB and consent of instructor.

**5100. Topics. 1-3 (Max. 12).** Provides graduate students with the opportunity for critical analysis and in-depth examination of various topics in the field of Disability Studies. *Prerequisite:* upper division/graduate standing.

**5990. Graduate School Internship. 1-12 (Max. 24).** Provides graduate students with the opportunity for internship experiences within the disability field.

# Interdisciplinary Programs

## Biomedical Sciences Ph.D. Program

Health Sciences 484

Web site: <http://www.uwyo.edu/biomedphd/>

Program Director: Sreejayan Nair, Ph.D.

### Degree Offered

#### Ph.D. in Biomedical Sciences

Biomedical sciences is the study of human biological processes; the complex interactions between physiological, genetic and environmental factors that influence disease and health. It spans the spectrum from fundamental discovery to innovation and application.

Areas of focus may include but not limited to cardiac health, nutrition, reproductive biology, toxicology, diagnostic & imaging and medical engineering.

The PhD program in biomedical sciences is designed to position graduates for long-term competitive success in the rapidly changing and multifaceted health-related arena in the 21st century. It is a comprehensive, interdisciplinary program, making connections between various disciplines to gain new insights, discover and apply new knowledge, and promote self-directed, life-long learning.

Biomedical Sciences is a research & discovery focused program balancing depth and breadth of content knowledge with "enabling" skills including problem solving, innovation, entrepreneurship, communication and leadership.

### Program of Study

**Rationale:** The program of study is designed according to student learning goals and research opportunities. It blends depth and breadth of preparation by providing broad core requirements with electives promoting specialization in a "parent" discipline. This is recognized on program documentation by a Doctorate in Biomedical Sciences/"specialization" area. For example, Doctorate in Biomedical Sciences/Reproductive Biology.

**Student Learning Outcomes:** The BMS program provides unique array of formal courses and informal discovery experiences focused on ensuring aptitudes, behaviors and skills necessary for leadership and competitive success in the biomedical science arena.

Although the foundation enabling innovative, independent thinking and knowledge discovery is deep discipline knowledge, the BMS program is also designed to promote student competency in information assessment, synthesis and integration, communication and translation to the broader community, teamwork, leadership and project management.

The BMS program trains graduates to be competent, skilled experimentalists, problem solvers, critical and independent thinkers, expert in their field, with both depth and breadth of knowledge.

In addition, the program aims to instill characteristics that are essential to long-term professional success, preparing scientists who are effective and dedicated mentors and teachers, organized administrators, exemplars of high ethical standards, and effective collaborators. Upon completion of the program, graduates will demonstrate:

- Independent, critical thinking skills
- Ability to identify appropriate biographical resources
- Knowledge of recent advances in discipline and related areas
- Understanding of a broad spectrum of research methodologies and their applications
- Ability to critically analyze research findings
- Ability to design and independently execute research
- Ability to use appropriate information technology to record, manage, and disseminate information
- Understanding of issues related to researcher and subject rights
- Motivation and aptitude needed to acquire knowledge
- Communication skills that are appropriate for a range of audiences and purposes
- Ability to construct and articulate arguments to a wide range of audiences
- Ability to effectively support the acquisition of knowledge by others when teaching or mentoring students
- Willingness to assume responsibility for their work
- Ability to design and teach undergraduate or graduate courses
- Ability to publish single/first authored papers in peer-reviewed journals

## Biomedical Sciences (BMS)

**5880. Biomedical Sciences Research Ethics. 2.** Introduction to the field of bioethics, including major ethical theories and principles, with an emphasis on understanding the ethical issues that may arise while conducting biomedical research and potential strategies for properly addressing these ethical issues.

**5920. Continuing Registration: On Campus, 1-12 (Max. 24).** *Prerequisite:* graduate standing.

**5940. Continuing Registration: Off Campus, 1-24 (Max. 24).** *Prerequisite:* graduate standing.

**5960. Thesis Research, 1-24 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5980. Dissertation Research, 1-24 (Max. 24).** Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

**5985. Seminar. 1 (Max. 3).** A series of weekly seminars presented by faculty from other universities, private or public sector health industries or by Biomedical Science Program faculty and students. Examines current topics and research in biomedical sciences through oral presentations and discussion. *Prerequisites:* graduate standing and consent of instructor.

## Program in Ecology

Berry Center 231

Phone: (307) 766-6240

E-mail: [ecology@uwyo.edu](mailto:ecology@uwyo.edu)

Web site: [www.uwyo.edu/pie](http://www.uwyo.edu/pie)

Program Director: Robert O. Hall, Jr., Ph.D.

### Degree Offered

#### Ph.D. in Ecology

The Program in Ecology prepares doctoral students to lead the discipline of ecology during the coming decades. The program is grounded in the natural history of organisms in their environment, but incorporates tools and perspectives from across the biological, physical, mathematical, computational, and earth sciences. Students develop conceptual, historical, and philosophical perspectives spanning the entire range of subdisciplines in ecology, while receiving advanced training in the subdiscipline of their individual interest.



The program fosters long-term career development by exploring the linkages of ecology with other disciplines, and by scanning the ecological horizon for emerging questions, concepts, and approaches that will shape the field in years to come.

Faculty members from several departments and colleges participate in the Program in Ecology. Their interests span the full range of topics covered in the field of ecology, and students in the program reflect this diversity.

### Program Specific Admission Requirements

Only students seeking a doctoral degree will be admitted into the program. Minimum criteria for admission to the Program in Ecology are:

- Minimum score of 900 on the Graduate Record Examination (GRE) general test (minimum of 291 on newest GRE)
- Minimum undergraduate GPA of 3.0
- Agreement by a member of the PiE faculty to sponsor the student, or to co-sponsor the student together with a PiE affiliate
- Admission to a home department at the University of Wyoming

All applications to the program will be reviewed by Graduate Affairs Committee, which has authority on admissions. Students applying to the program who lack a master's degree must show exceptional promise and commitment (e.g., through undergraduate or post-graduate research experiences, peer-reviewed publications, and/or success in competing for research fellowships). Such students are encouraged to consult with their prospective adviser on whether to apply directly to PiE or to master's programs in individual home departments of PiE faculty.

Students already admitted to doctoral programs in individual departments at the University of Wyoming may apply to transfer to the program. Transfer is not pro forma. Transfer applications are subject to the same criteria as for entering students, and admission to the program for transfer students must be approved by the Graduate Affairs Committee.

### Program Specific Degree Requirements Advisory Committee

Before the end of the second semester of study, the student should nominate a five-member advisory committee to the Office of the Registrar. At least three members of the committee, including the committee chair

(usually the student's adviser), will be members of the PiE faculty. One other member, who will serve as Graduate Faculty representative, must be from outside the home department of the major adviser, although (s)he can be a faculty member in a department that participates in the program. The committee will advise the student on his/her program of graduate study, execute and evaluate the student's preliminary examination, evaluate the student's dissertation proposal and dissertation, and conduct the student's dissertation defense.

### Program of Study

All students are required to take ECOL 5100 or equivalent. This course should be taken during the first year of residency. All students are required to take ECOL 5550 in their final year. All students should take ECOL 5350 or its equivalent at least once a year, excepting years when they are enrolled in 5100 or 5550. Exceptions or substitutions of these requirements are subject to approval by the graduate affairs committee.

The program of study must include at least 6 credit hours aimed at developing a tool skill, which except for rare cases shall be in the quantitative/analytical domain (e.g., statistics, modeling, GIS, remote sensing, bioinformatics). Courses relating to research tools should be taken early in the student's residency to ensure that they can be used in thesis research and advanced studies. Specific coursework and tool-skill development for the student's program of study will be developed in consultation with and subject to approval by the student's advisory committee.

### Admission to Candidacy

Admission to candidacy for the Ph.D. requires two steps: 1) providing evidence that the student is prepared to identify a research question, design an approach for investigating that question, and a plan for executing the approach, all in the format of an NSF-style research proposal, and 2) illustrating adequate proficiency in the subject matter of ecology through a process involving both written and oral exams.

### Proposal

Students must submit a NSF-style proposal to their committee outlining their project, typically by the end of the fourth semester. Each committee member will provide feedback to the student on the proposed research and indicate approval of the proposal or request revision. The proposal must be approved by all committee members prior to starting the preliminary exams.

While this proposal should be a plan for actual dissertation research, unforeseen circumstances may require altering the student's dissertation work after the proposal has been approved by the committee. In the case of a major alteration, the student should reformulate a research plan and submit it to the committee in writing for committee approval.

### Preliminary Exam

Passing the preliminary exam is the official admission to candidacy.

*Written portion of the preliminary exam.* The student will take the written exam portion of the preliminary exam no fewer than two weeks following approval of the research proposal. The goal of this exam is to test breadth of knowledge in ecology. The design of this exam will be coordinated by the graduate committee under the leadership of the adviser. Each written exam will cover the following topics:

- Ecological topics ranging from organismal/evolutionary to ecosystem-level perspectives, integrating concepts and perspectives from across the discipline, over a wide range of spatial and temporal scales.
- The philosophical and historical development of ecology.
- The conceptual background of the student's area of specialization.

The exam will consist of four to six questions developed collectively by the committee and organized by the student's major professor. The exam will be open book; however, the answers will be solely the work of the student. Answers should be fully cited and collectively should be no longer than 30 pages double-spaced exclusive of references cited. Students will have one full week (seven days) to complete the exam. Committee members will indicate pass/fail within one week following completion of written exams. Four of five passing votes are required.

*Oral Portion of the Preliminary Exam.* No sooner than two weeks after successfully passing the written exam, the student may proceed to an oral exam administered by his/her graduate committee. Oral exams center around three goals from which questions will be derived:

- To verify that the student is prepared, conceptually and methodologically, to carry out successful dissertation research.
- To evaluate the student's ability to conceptualize specific questions in a broad, integrative context.

To evaluate the student's ability to think spontaneously and creatively and to articulate responses about unexpected or novel questions.

The advisory committee will discuss and organize specific questions based on these goals in a short session at the beginning of the exam period before admitting the student to the examination room and starting the exam. Following the exam each committee member will provide non-binding paper votes of pass/fail for each of the three goals of the oral exam. Following discussion of the student's performance, committee members will each assign a grade of pass/fail for the overall exam. Four of five committee members must vote for passing the overall oral exam.

Students whose performance is unsatisfactory will be given one opportunity for retaking the oral examination. This retake will occur no later than the academic-year semester following the first examination.

### Public Seminars

Students are required to give two oral presentations on their research. The purposes of these presentations are to provide the student with practice in oral presentations and to keep the PiE community informed of the student's progress. The first will describe the student's dissertation research proposal. This presentation will be given before the student submits his/her thesis proposal. The second presentation will summarize the student's completed dissertation research, and will normally be given the same semester as the student's dissertation defense. Under extraordinary circumstances (subject to approval by the Graduate Affairs Committee), this presentation may be given at an earlier time. These presentations must be open to the public, and may comprise part of a departmental or Program in Ecology seminar or brown-bag series.

### Ecology (ECOL)

**5050. Techniques in Environmental Data Management. 4.** Centers on the role of information technology in support of scientific research. Through integration of multiple software packages (e.g. Relational databases, ProgramR and ArcGIS), proven database designs, and SQL scripting, increased efficiency and utility will occur during data analyses. These information science principles are demonstrated using project-based examples. Cross listed with ENR/GEOG 5050. Prerequisite: graduate standing.

### 5060. Fundamental Concepts in Evolution.

**3.** Explores fundamental concepts in evolutionary biology including evolutionary ecology, population genetics, and speciation with an emphasis on both theoretical frameworks and practical applications. Discussion included. Cross listed with BOT/ZOOL 5060. Prerequisite: graduate student in good standing.

**5100. Ecology as a Discipline. 3.** Covers the range of ecological questions, processes, scales, and research approaches, in context of the history and philosophy of science in general and of ecology in particular. Aimed at first-year students in the doctoral program in Ecology, although students in other graduate programs are welcome. Prerequisite: graduate standing.

**5350. Seminar in Ecology. 1-3. (Max. 12).** Exploration of topical issues in ecology, based on discussions of relevant literature. Prerequisites: graduate standing and consent of instructor.

**5540. Microbial Diversity and Ecology. 4.** Introduces the diversity and ecology of soil microbes through an integrated lecture and laboratory course. Emphasis on molecular approaches to analyzing microbial diversity and evolution, and student-directed experimental design. Provides a continuum of realistic research experiences in molecular microbial ecology, from field work to evolutionary analysis of DNA sequence data. Cross listed with MOLB 5540. Prerequisite: MOLB 2210.

**5550. Ecology as a Scientific Profession. 2.** A capstone that prepares doctoral students for success and leadership in their careers as professional ecologists. Intended for students enrolled in the doctoral Program in Ecology in their final year. Prerequisite: graduate standing.

**5610. Quantitative Modeling in Landscape Ecology. 3.** Emphasis on quantitative, spatial analysis of landscapes and application of these quantitative tools to making sound management decisions. Work with real data, acquire high-level quantitative skills, develop problem-solving skills, and discuss management application of model results. Analysis will encompass abiotic, biotic (plant and animal), and human use of ecological systems in a spatial context. Cross listed with REWM 5610. Prerequisites: upper division stats course (e.g., STAT 4015 or STAT 4025) and graduate standing.

**5620. Advanced Topics in Ecology. 1-4. (Max. 12).** Provides advanced treatment of specific topics in ecology that are not covered in regular courses. Prerequisites: graduate standing and consent of instructor.

**5745. Terrestrial Ecosystem Ecology. 3.** Advanced course examines fundamental ecosystem functions and their relationship to

ecosystem structure using a systems approach. We study cycles of carbon, water and nutrients through ecosystem components with an emphasis on interactions among plants, soil, and the atmosphere. Current readings focus on responses of terrestrial ecosystems to global climate change and human disturbance. Cross listed with BOT 5745. Prerequisite: one course in ecology.

**5775. Forest Ecology. 4.** Integrative study of the structure, function, and ecological diversity of forested ecosystems, and the physical factors that influence this diversity, including emergent properties of energy flow and nutrient cycling. Special emphasis is given to understanding forest disturbances and succession, and implications for impacts of management and sustainability are discussed throughout. Cross listed with RNEW 5775 and BOT 5775. Prerequisite: LIFE 3400.

**5780. Research in Ecology. 1-6 (Max. 12).** Designed for doctoral students pursuing exploratory research before they have determined a dissertation project, and for students to pursue independent research that will not comprise part of their dissertation. Research must be conducted under supervision of an Ecology Faculty member or Affiliate. Prerequisite: admission to doctoral Program in Ecology.

**5920. Continuing Registration: On Campus, 1-2 (Max. 16).** Prerequisite: graduate standing.

**5940. Continuing Registration: Off Campus, 1-12 (Max. 16).** Prerequisite: graduate standing.

**5980. Dissertation Research. 1-12 (Max. 48).** Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. Prerequisite: enrollment in a graduate level degree program.

### Food Science and Human Nutrition

Phone: (307) 766-2224 or (307) 766-4145  
Web Address: [www.uwyo.edu/anisci](http://www.uwyo.edu/anisci) or [www.uwyo.edu/fcs](http://www.uwyo.edu/fcs)

### Degree Offered

M.S. in Food Science and Human Nutrition

The interdisciplinary food science and human nutrition master's degree program, jointly sponsored by the departments of Animal Science and Family and Consumer Sciences, affords students the opportunity to pursue graduate work in the areas of human nutrition and/or food science. Prior to admission to the program, students will select the

major department (Animal Science or Family and Consumer Sciences) that best suits their desired research area(s) and indicate which faculty member from that department they would prefer as a mentor. Students choosing the interdisciplinary program in food science and human nutrition will gain expertise in theory as well as research in some combination of the areas of food microbiology, meat science and food chemistry, human nutrition and metabolism, food product development, and community nutrition. All students will be exposed to laboratory as well as classroom learning experiences.

### Program Specific Admission Requirements

Recommended prerequisites for students entering the program:

One semester of organic chemistry (may include laboratory)

Human or animal anatomy and physiology

Introductory statistics

### Program Specific Degree Requirements

One semester of biochemistry (may include laboratory)

Human or animal anatomy and physiology

Statistics

A minimum of 30 credit hours is required for this degree. Students may be required to take more than the minimum number of credit hours, either because they have to satisfy prerequisites for some of their graduate-level courses, or because a student's committee determines that more than 30 hours will be needed for the student to reach his/her professional objective. The student's program of study must include at least one credit hour of graduate-level seminar. A thesis is required. Students may request their area of thesis research be in food science or in human nutrition.

Students may use facilities such as the meat processing laboratory, sensory evaluation rooms, experimental kitchens, and a variety of modern facilities for research involving small animals and human subjects. Laboratory instruments including high performance liquid chromatographs, electrophoresis equipment, densitometers, gas chromatographs, ultracentrifuges, scintillation counters, differential scanning calorimeters, and histological equipment as well as computers are also available.

See the Food Science (FDSC) and Family and Consumer Sciences (FCSC) section of this catalog for course listings.

## Molecular and Cellular Life Sciences

203 Animal Science/Molecular Biology Complex

Phone: (307) 766-3300

E-mail: [mcls@uwyo.edu](mailto:mcls@uwyo.edu)

Web Address: [www.uwyo.edu/mcls](http://www.uwyo.edu/mcls)

Program Director: David Fay, Ph.D.

Admissions Director: Peter Thorsness, Ph.D.

### Degree Offered

Ph.D. in Molecular and Cellular Life Sciences

This interdisciplinary program with more than 40 faculty participants spans a wide range of research topics, such as:

Biotechnology, bioengineering, biomaterials, and pharmacology

Cell biology and signaling

Genetics and development

Genomics, proteomics, and computational biology

Microbiology and infectious disease

Structural biology and biophysics

Coursework focuses on core courses in biochemistry and molecular biology, with electives that include such diverse courses as:

Topics in Genomics

Biophysics

Microbial Physiology and Metabolism

Cell and Developmental Genetics

Mass Spectrometry and

Analytical Chemistry

Biomedical Engineering

Mammalian Endocrinology

Cell Culture and Virology

Introduction to Bioinformatics

Protein Structure and Function

Microbial Genetics

Computational Biology

Quantitative Microscopy

### Program Specific Admission Requirements

Admission to MCLS is a two-step process. The first level of evaluation is carried out by the MCLS admissions committee. This step does not require any fee but does require that all requested materials be submitted as described on our website. Applicants who are chosen for admission to the MCLS program will then complete the final application step through the University of Wyoming Admissions office. This latter step does require a \$50 processing fee by the university along with the completion

of several additional forms. Students are then officially notified by the university of their acceptance into the MCLS program.

We encourage students to submit their completed applications at the very latest by January 15 of each calendar year. However, because our review of applications will begin in the late fall, early submissions are encouraged and may stand a greater likelihood of success. Also note that we will continue to review new applications received after January 15 in the event that additional slots are available.

### Program Specific Degree Requirements

MCLS doctoral students must fulfill the minimum requirements outlined by the university. In addition, students must obtain a high level of proficiency in the core foundations of the molecular and cellular life sciences through required courses in biochemistry/molecular biology, scientific literature analysis proficiency, and the MCLS cornerstone course. Because of the broad range of research interests pursued by MCLS faculty and students, considerable flexibility will be exercised regarding the specific nature of the graduate-level elective courses that students may take.

Students must successfully complete four eight-week rotations in MCLS laboratories of their choice during the first year.

Students must pass a comprehensive assessment exam at the end of the first year. Towards the end of the second year, students will undertake a qualifying examination in order to be formally admitted to graduate degree candidacy. This exam will have both written and oral components and will cover areas of science that are relevant to the students' research.

The research and coursework progress of MCLS students will also be monitored and evaluated every year by the MCLS curriculum committee. In addition, an annual meeting with a research-specific dissertation committee will facilitate and evaluate the research progress of MCLS students beginning in the second year.

Students must attend weekly outside seminars on topics in the molecular life sciences for the durations of their studies.

Students must annually present their work at the MCLS Symposium.

For more information, please see the program's Web site at: [www.uwyo.edu/MCLS/](http://www.uwyo.edu/MCLS/).

## Neuroscience

Phone: (307) 766-6446

E-mail: flynn@uwyo.edu

Web Address: www.uwyo.edu/  
neuroscience

Program Director: Francis W. Flynn,  
Ph.D.

### Degrees Offered

Ph.D. in Neuroscience

The Graduate Neuroscience Program offers training leading to the Ph.D. degree in neuroscience. The Neuroscience Program emphasizes systems and integrative approaches, and our goal is to provide the students with the necessary background to be broadly trained research neuroscientists and to carry out independent research in neuroscience. The Neuroscience Program emphasizes continuing interaction with faculty from several departments and we have a low student to faculty ratio. The educational philosophy of the Neuroscience Program is to encourage a problem-oriented rather than a strict discipline-bound approach to research. You will emerge from this program with the scientific and experimental training needed to comprehensively address a very wide range of research questions using a variety of techniques and analytic tools.

The Graduate Neuroscience Program is designed to enable graduate students to acquire competence in the various disciplines necessary for research and teaching careers in neuroscience. The current interests of the Neuroscience faculty include sensory neurophysiology, behavioral neuropharmacology, neurodevelopment, neuroendocrinology, neurodegeneration, and synaptic plasticity.

Students and faculty have access to outstanding resources established by NIH Neuroscience Core grants. The Microscopy Core houses both light (Zeiss laser scanning, fluorescent) and electron (Transmission and Scanning) microscopes. Resources needed to conduct research ranging from behavioral to cellular or molecular are readily available within the Neuroscience Center.

### Doctoral Program Admission Minimum Requirements

GRE: 1100;

GPA: 3.0 (4.0 scale);

Three favorable letters of recommendation;

Bachelor's degree in a biological science from an accredited institution;

Statement of research interests and career objectives. We recommend that students study the Neuroscience faculty web sites and contact faculty regarding openings and shared research interests.

You will be best prepared for our program if you have successfully completed courses in neuroscience, chemistry, biology, physiology, and cell/molecular biology. Students may be admitted with deficiencies in some of the areas if they are strong in many or all others. If so, the student's advisory committee will determine what additional work is necessary during the first year to correct any deficiency.

### Program Specific Degree Requirements

#### Doctoral Program

All doctoral Neuroscience students are required to complete a 30 hour program of core classwork that includes the following required courses: Introduction to Neuroscience, Structure and Function of the Nervous System and Neurophysiology. Students are required to take one course in Statistics (e.g. STAT 5050, STAT 5210) and the course that meets this requirement will be arranged with the student's committee. The statistics requirement must be met by the end of the second year. The Neuroscience Program is a research-oriented program and students are expected to take a minimum of 2 to 3 credit hours of research per semester. Students are also expected to enroll in an on-going Seminar in Neuroscience each semester. The Neuroscience Seminar, which meets weekly and is attended by students and faculty members, provides an opportunity for intellectual and social exchange, as well as for the development of professional skills in critical thinking. The topic for seminar and the faculty member directing the seminar changes each semester. The remainder of the 30 hours requirement for the doctor of philosophy degree is selected from designated courses in Neuroscience, physiology, pharmacology, and molecular biology. A grade of B or better is required for all Neuroscience courses.

A student is expected to have a graduate adviser at all times. The faculty adviser must be a participating member of the Neuroscience faculty. The adviser is responsible for directing the student's research and academic coursework. During the second year, the student will have an advisory committee. The advisory committee will consist of at least three neuroscience faculty members and an outside member. Normally, the student's adviser will chair the committee and help identify members of the committee who best match

the student's area of interest. The role of the advisory committee is to oversee all aspects of the student's education after the first year.

In the student's second or third year, the advisory committee will set and evaluate the student's qualifying examination. After completion of the preliminary examination, the committee will evaluate the student's dissertation proposal and, eventually, the completed dissertation.

The dissertation is the single most important component of the graduate program. It reports the results and significance of the student's research. In addition to the written dissertation, the doctoral candidate will deliver a formal 50 minute seminar based on the research. The seminar will be followed by an examination by the student's advisory committee.

## Reproductive Biology

Phone: (307) 766-6278 or 766-4378

E-mail: balex@uwyo.edu or  
enette@uwyo.edu

Web Address: www.uwyo.edu/reprobio  
Program Directors: Brenda Alexander,  
Ph.D. and Enette Larson-Meyer, Ph.D.

### Degrees Offered

M.S. and Ph.D. in Reproductive Biology

The University of Wyoming offers an innovative program of graduate studies in vertebrate reproductive biology. This interdisciplinary graduate program was established in 1986 and combines the expertise of faculty members who have established records of accomplishment. Areas of emphasis include: ovarian biology, fetal/placental physiology, neuroendocrinology, nutrition/reproduction interactions, lactation, pituitary cytoarchitecture, human nutrition/exercise/reproduction, reproductive immunology, and the fetal origins of growth efficiency, reproductive function, and adult disease. In this regard, the Center for the Study of Fetal Programming, which was initiated in 2002, has established a link between faculty at the University of Texas Health Sciences Center, San Antonio, Texas, and the UW faculty in this program, emphasizing both biomedical and agricultural-related research.

The opportunity to study in these exciting areas is made available primarily through the collaborative efforts of the faculty in the departments of Animal Science, Family and Consumer Sciences, Molecular Biology, Veterinary Science, and Zoology and Physiology, as well as the School of Pharmacy. Programs are offered leading to the M.S. degree in Reproductive Biology or Ph.D. degrees in Biomed-

cal Sciences/Reproductive Biology. Qualified students are eligible to compete for a graduate assistantship assigned to the program. Post-doctoral positions provide advanced training in research and teaching.

Both the research and teaching aspects of the program reflect a truly interdisciplinary approach. Research activities range from directly applied to fundamental. Animals used for investigation can include livestock and laboratory species. Modern laboratories are designed for hormonal, chemical, and molecular analysis of biological samples, light, electron and confocal microscopy, incubation of cells, tissues and small animal experimentation. Well-equipped large animal surgical and handling facilities are located at the Laramie Agriculture and Extension Center and Red Buttes Research Center. A well equipped human nutrition and exercise facility is located on campus.

**Program Specific Admission Requirements**

- GRE composite score of 291 and 297 for M.S. and Ph.D. students, respectively.
- GPA of 3.00 (with A=4.00).
- TOEFL score of 540 for students whose native language is not English.

**Program Specific Degree Requirements**

Requirements are based on the university minimum requirements.

**Water Resources**

**College of Agriculture and Natural Resources**  
**Department of Ecosystem Science and Management**  
**8 Agriculture Building**  
**Phone: (307) 766-4274**  
**E-mail: [snmiller@uwyo.edu](mailto:snmiller@uwyo.edu)**  
**Web Address: [www.uwyo.edu/ware/](http://www.uwyo.edu/ware/)**  
**Program Director: Scott N. Miller**

**Degrees Offered**

M.A. or M.S. in (Program Name)/Water Resources

Academic departments across the university cooperate to provide master of arts or master of science degree programs that contain multidisciplinary training in water resources. The master's degree offered through these affiliations is awarded as a major with each of the sponsoring department's graduate pro-

grams. The water resources interdisciplinary major will be acknowledged on the graduate transcript and thereby certify to potential employers that the candidate has completed an in-depth multidisciplinary course program in the broad area of water resources.

The educational underpinnings of this program include the following:

- The purpose of the program is to provide multidisciplinary education and to impart a multidisciplinary perspective to candidates.
- Training is to be consistent with the rigor of professional water resources demands.
- The interdisciplinary major program is flexible so as to meet the candidates' individual professional objectives.

Primary responsibility for student guidance and graduate program formulation resides with the sponsoring department and sponsoring major professor. Once accepted, each candidate's graduate committee will contain at least one member drawn from the Water Resources Curriculum Committee.

Please refer to latest updated information on the Web site listed above:

- Scott Miller, chair, ESM
- Don McLeod, Agriculture and Applied Economics
- Carol Frost, Geology and Geophysics
- William Gribb, Geology
- Wayne Hubert, Zoology and Physiology
- Drew Johnson, Civil and Architectural Engineering
- David Legg, ESM

Upon acceptance to the program, the sponsoring department must assign a member of the Water Resources Curriculum Committee to the candidate's graduate committee. The Water Resources Curriculum Committee's representatives on the candidate's graduate committee shall aid in formulating deficiency requirements, course program design, academic performance criteria, and research objectives throughout the candidate's tenure in the program.

**Program Specific Admission Requirements**

- University application and fee;
- Application fee is valid for three years;
- Official documentation indicating bachelor's degree earned (not necessary if UW is the most recent institution attended);
- Potential candidates are encouraged to apply for admission to this program by contacting the participating

department and by specifying at the initiation that they desire admission to the water resources interdisciplinary major. Their credentials will be evaluated by the sponsoring department and the department recommends admission of the individual into the program to the UW Admissions office.

**Program Specific Degree Requirements**

The academic program of study undertaken by the candidate must be designed to enhance the student's background and expertise through formal graduate level coursework in the areas of: (1) technical hydrology, (2) natural resources economics and/or law, and (3) water quality. To insure a minimum multidisciplinary character, the course program must contain nine hours of coursework with at least 3 hours from each of the aforementioned areas and at least 6 of those credit hours must be from outside the student's sponsoring department, along with a 1 credit hour seminar on water resources organized through the Department of Ecosystem Science and Management. Only Plan A master's degree programs, which require the writing of a thesis in the water resources area, are acceptable for the water resources degree option.

**A. Hydrology (3 hours)**

CE 4800 Hydrology .....	3
CE 4820 Groundwater and Drainage Engineering .....	3
CE 5810 Groundwater Hydrology .....	3
GEOG 5050 Fluvial Geomorphology.....	3
GEOG 5444 Geohydrology.....	3
GEOG 5550 Numerical Methods Groundwater Geology.....	3
GEOG 5570 Advanced Geohydrology .....	3
REWM 5285 Wildland Hydrology.....	3
SOIL/MATH 5110 Modelling Flow Transport in Soil and Groundwater Systems .....	4

**B. Law/Natural Resource Economics (3 hours)**

AGEC 4710 Natural Resources Law & Policy .....	3
AGEC 4720 Water Resource Economics.....	3
AGEC 5630 Advanced Natural Resource Economics .....	3
ECON 4400 Environmental Economics .....	3
ECON 4410 Natural Resource Economics .....	3
ECON 5400 Advanced Resource & Environmental Economics.....	3
LAW 6660 Environmental Law.....	3
LAW 6860 Water Rights.....	3

**C. Water Quality (3 hours)**

GEOL 4490 Geochemistry .....3  
 GEOL 5450 Water Quality Modeling .....3  
 GEOL 5777 Geochemistry of Natural Waters .....3  
 REWM 4710/5710 Watershed Water Quality Management .....3  
 SOIL 4130/5130 Chemistry of the Soil Environment .....4  
 ZOO 4440 Limnology .....3

**D. One-Hour Seminar in Water Issues**

REWM 5250. Seminar in Water Resources .1

Each student in the water resources interdisciplinary major program will be required to complete this course once during their graduate program. As part of the requirements for the seminar: (a) students will be required to present a seminar on a current water resource issue in Wyoming and to develop an executive summary of their issue to distribute to class participants. Each student is also required to participate in a discussion group following each seminar which stresses the interdisciplinary nature of the issue; (b) during the course of a student's graduate program, he/she will be required to present one seminar for the seminar series (preferably on some aspect of their thesis research). This presentation does not have to occur during the semester that the student is officially signed up for seminar credit.

**Agricultural Economics/  
Water Resources**

**Department of Agricultural and Applied Economics**

**206 Agriculture Building**

**Phone: (307) 766-2386**

**E-mail: ag-econ@uwyo.edu**

**Web Site: www.uwyo.edu/agecon/**

The objective of this program is to provide students with specialized study in water resources and to signify this specialization by the designation of the water resources interdisciplinary major on the transcript.

**Coursework and Thesis**

Students must complete the 24 credit hour agricultural and applied economics including M.S. core requirements plus 4 thesis hours and 9 credit hours in water resources approved courses.

Achieve a cumulative 3.0 GPA in the AGECE M.S. core requirements.

The candidate's graduate committee, nominated by the major professor, the student and the department head determine the final program of study and thesis research topic, which must be in the water resources area.

Presentation of research results at a formal public seminar.

Completion of an oral examination covering the student's thesis research administered by the graduate committee.

**Oral Exam Requirement**

In addition to coursework and a Plan A Thesis, students must pass a final oral examination. The student's committee may also require a written examination.

**Interdisciplinary Component**

nine hours  
(see Water Resources degree requirements)

**Botany/Water Resources**

**Department of Botany**

**114 Aven Nelson Building**

**Phone: (307) 766-2380**

**Web Address: www.uwyo.edu/botany**

In addition to the general requirements for admission to the existing master's program in botany, the master of science in botany/water resources interdisciplinary major requirements will include the following variations:

**Coursework and Thesis**

16 semester hours are required in botany, plus 9 semester hours in water resources courses. Other courses in mathematics, physics, chemistry, and statistics also may be required as the special program and undergraduate preparation require.

Due to the various, potential subspecialties that students might follow in connection with a botany/water resources interdisciplinary major, no particular botany courses are prescribed. An appropriate array of courses for the desired specialty will be determined by agreement between the advisory committee, graduate student adviser, student, and with the approval of the Water Resources Curriculum Committee.

For the water resources interdisciplinary major, a Plan A Thesis is required. The student must present his or her research in a seminar before the department, and must pass an oral exam on the thesis research.

**Interdisciplinary Component**

9 hours  
(see Water Resources degree requirements)

**Civil Engineering/Water Resources**

**Department of Civil and Architectural Engineering**

**3074 Engineering Building**

**Phone: (307) 766-5255**

**E-mail: ceinfo@uwyo.edu**

**Web Address: www.eng.uwyo.edu/civil/**

The purpose of this program is to broaden the students' master of science program in the water resource area in civil engineering.

**Plan A Thesis Requirement**

Only students with a M.S. Plan A thesis option are eligible. The student's graduate committee will include at least one member of the Water Resources Curriculum Committee.

**Coursework and Thesis**

Each student must complete a minimum of 28 hours of graduate level coursework and a thesis under Plan A (4 credit hours) to qualify for the master of science in civil engineering/water resources.

The student must obtain at least 18 credit hours of graduate level coursework in engineering, emphasizing a concentration of core courses in a particular area of emphasis in civil engineering. The core course areas of emphasis for this program are hydrologic and hydraulic engineering. The particular set of courses for a given area of emphasis will be designated by the faculty in the water resources area for these areas of emphasis with the approval of the Civil Engineering Graduate Committee.

**Interdisciplinary Component**

9 hours  
 A. Technical Hydrology (3 hours)  
 GEOL 5444 Geohydrology .....3  
 GEOL 5550 Numerical Methods in Groundwater Geology I .....3  
 GEOL 5570 Advanced Geohydrology .....3  
 REWM 5285 Wildland Hydrology .....3  
 REWM 5280 Stream Habitat Management...3  
 B. Law/Natural Resource Economics .....3  
 (please refer to the general degree requirements for a list of courses)  
 C. Water Quality (three hours)  
 GEOL 5450 Water Quality Modeling .....3  
 GEOL 5777 Geochemistry of Natural Waters .....3  
 MOLB 4410 Water Microbiology .....3  
 MOLB 4500 Microbial Ecology .....3  
 ZOO 4440 Limnology .....3

## Entomology/Water Resources

Department of Ecosystem Science and Management

2013 Agriculture Building

Phone: (307) 766-3114

Web Address: [www.uwyo.edu/esm](http://www.uwyo.edu/esm)

Ecosystem Science and Management

E-mail: [esm@uwyo.edu](mailto:esm@uwyo.edu)

The purpose of this program is to enhance the cross-disciplinary linkage between entomology and water resources, and to provide students an entomology degree program which emphasizes the important issues in water resources. Aquatic insects are increasingly being used as bioindicators of aquatic ecosystem health. This is an area of environmental assessment that is rapidly expanding, as is the job market for scientists with this blend of skills.

### Coursework and Thesis

Each student must complete a minimum of 26 credit hours of graduate level coursework and 4 thesis credit hours of ENTO 5960 to qualify for a master of science degree in entomology/water resources. Specific coursework will be determined by the student's graduate committee; however, each student is required to enhance his/her background and expertise in the water resources area through specialized coursework and a seminar as shown below.

- A. ENTO 5678 Aquatic Entomology (3)
- B. Interdisciplinary component  
9 hours  
(see Water Resources degree requirements)

### Plan A Thesis Requirement

Only Plan A thesis students are eligible for the master of science in entomology/water resources. In addition to coursework and a Plan A thesis, students must pass a final written and oral examination. The student's graduate committee will include at least one member of the Water Resources Curriculum Committee to help ensure adherence to the master of science in entomology/water resources degree requirements and that research efforts are in the water area.

## Geography/Water Resources

Department of Geography

207 Arts and Sciences Building

Phone: (307) 766-3311

Web Address: [www.uwyo.edu/geog](http://www.uwyo.edu/geog)

The master of arts in geography/water resources is consistent with traditional emphases and long-term goals of the Department of Geography in natural resource management and studies of the Rocky Mountain-Great Plains environment.

### Prerequisites

15 credit hours in geography, including: 3 hours in Maps and Mapping, 3 hours in Human Geography, and 3 hours in Physical or Environmental Geography. These credits will not count toward the master's degree.

### Plan A Thesis Requirement

Only students with a Plan A thesis option are eligible. In addition to coursework and a Plan A thesis, students must pass a final oral examination. The student's committee may also require a written exam. The student's graduate committee will include at least one member of the Water Resources Curriculum Committee.

### Coursework and Thesis

Each student must complete a minimum of 30 hours of graduate level coursework and a thesis under Plan A (GEOG 5960 for four credit hours). Specific requirements are outlined below, with course credit hours shown in parentheses.

- A. Core requirements  
GEOG 4280 or 5000 level (4)  
Any two of the following methods courses (6-8 credit hours):  
GEOG 4000 Terrain Analysis .....3  
GEOG 4150 Cartography and Digital Map Design .....4  
GEOG 4200 Intro to Geographic Information Systems .....3  
GEOG 4210 Advanced Geographic Information Systems .....3  
GEOG 4860/5000 level ..... 1-6  
GEOG 4865/5000 level- Research seminar (4 credit maximum allowed in the core requirement)

GEOG 5790 Research Methods..... 1-3

All students must have committee approval to initiate research on their theses/professional papers and must successfully complete an oral defense of their theses/professional papers. The student's committee may also require a written examination.

- B. Interdisciplinary Component - 9 hours  
(see Water Resources degree requirements)
- C. REWM 5250 Seminar in Water Res .....1

## Geology/Water Resources & Geophysics/Water Resources

Department of Geology and Geophysics

122 S.H. Knight Geology Building

Phone: (307) 766-3386

E-mail: [acadcoord.gg@uwyo.edu](mailto:acadcoord.gg@uwyo.edu)

Web Address: <http://geology.uwyo.edu>

The purpose of this program is to formalize and broaden strong department offerings at the master of science level in ground water geology, natural waters geochemistry, mathematical hydrology, and fluvial geomorphology.

### Coursework and Thesis

Each student must complete a minimum of 26 hours of graduate level coursework and a Plan A thesis. In addition, the following specific core courses are required for the master of science in geology/water resources and geophysics/water resources degrees.

- A. GEOL 5444 Geohydrology.....3
- B. 1 of the following:  
GEOG 4830 Introduction Quantitative Methods in Geology .....3  
GEOG 4880 Surficial Processes .....3  
GEOG 5050 Introduction to Isotope Geology .....3
- C. GEOL 5777 Geochemistry of Natural Waters .....3  
GEOG 5444 can be used to satisfy the 3 hour technical course requirement or  
GEOG 5777 can be used to satisfy the 3 hour water quality course requirement.

### Admission Requirements

In addition to the department admission requirements, the undergraduate degree program earned by the incoming candidate must meet the minimum undergraduate requirements for the UW geology curriculum in mathematics, physics, and chemistry. The transcript should also demonstrate a strong background in physical geology.

**Plan A Thesis Requirement**

Only students with a Plan A thesis option are eligible. Students must follow the same program requirements as stated under Geology and Geophysics department section. The student's graduate committee will include at least one member of the Water Resources Curriculum Committee.

**Interdisciplinary Component**

9 hours  
(see Water Resources degree requirements)

**Rangeland Ecology and Watershed Management/  
Water Resources**

Department of Ecosystem Science and Management  
2013 Agriculture C Building  
Phone: (307) 766-3114  
E-mail: [esm@uwyo.edu](mailto:esm@uwyo.edu)  
Web Site: [www.uwyo.edu/esm](http://www.uwyo.edu/esm)

The purpose of this program is to enhance the cross-disciplinary linkage between range and forest management and water resources, and to provide students with a degree program in rangeland ecology and watershed management which emphasizes the important issues in water resources.

**Coursework and Thesis**

Water Resources requirements\*: 10  
Statistics: 3  
Range Management Seminar (REWM 5620): 1  
Other recommended graduate courses or substitution courses with adviser consent: 12  
Plan A thesis credit: 4  
Minimum: 30

\*Water Resources Requirements Interdisciplinary component  
9 hours  
(see Water Resources degree requirements)  
REWM 5250. Seminar in Water Resources (1)

**Soil Science/Water Resources  
Department of Ecosystem Science and Management**

2013 Agriculture C Building  
Phone: (307) 766-3114  
E-mail: [esm@uwyo.edu](mailto:esm@uwyo.edu)  
Web Address: [www.uwyo.edu/esm](http://www.uwyo.edu/esm)

The purpose of this program is to enhance the cross-disciplinary linkage between soil science and water resources, and to provide students a soil science degree program which emphasizes the important issues in water resources.

**Coursework and Thesis**

Each student must complete a minimum of 26 credit hours of graduate level coursework and 4 thesis credit hours of SOIL 5960 to qualify for a master of science degree in soil science/water resources. Specific coursework will be determined by the student's graduate committee; however, each student is required to enhance his/her background and expertise in the water resources area through specialized coursework and a seminar as shown below.

- A. Core courses - Students must take or have taken equivalent courses in the four soils disciplines: physics, pedology, chemistry, and microbiology.
  - SOIL 5100 Soil Physics (4)
  - SOIL 5120 Genesis, Morphology and Classification of Soils (3)
  - SOIL 5130 Chemistry of the Soil Environment (3)
  - SOIL 5140 Soil Microbiology (4)
- B. Enhancement courses - Students must take at least one of the following courses:
  - SOIL 5110 Modeling Flow Transport in Soil and Groundwater Systems
  - SOIL 5150 Forest and Range Soils
  - SOIL 5160 Soil Fertility and Fertilizers
  - SOIL 5170 Analytical Methods for Ecosystems Research
- C. Interdisciplinary component  
9 hours  
(see Water Resources degree requirements)
- D. REWM 5250 Sem in Water Resources ....1
- E. SOIL 5720. Graduate Seminar in Soil Science .....1

**Plan A Thesis Requirement**

Only Plan A thesis students are eligible for the master of science in soil science/water resources. In addition to coursework and a Plan A thesis, students must pass a final oral examination. The student's graduate committee will include at least one member of the

Water Resources Curriculum Committee to help ensure adherence to the master of science in soil science/water resources degree requirements and that research efforts are in the water area.

**Zoology and Physiology/  
Water Resources**

Department of Zoology and Physiology  
428 Biological Sciences Building  
Phone: (307) 766-4207  
E-mail: [zprequest@uwyo.edu](mailto:zprequest@uwyo.edu)  
Web Address: [www.uwyo.edu/zoology](http://www.uwyo.edu/zoology)

The purpose of this program is to broaden the master of science program in the water resources area by having students take 10 semester hours of coursework associated with water resources.

**Coursework and Thesis**

Each student must complete a minimum of 26 hours of graduate level coursework and 4 hours of Plan A thesis credit to qualify for the master of science in zoology and physiology/water resources. Specific coursework requirements will be determined by the student's graduate committee. The student must obtain at least 10 credit hours as indicated. Depending upon the student's undergraduate background and career interests, the graduate committee may require that these 10 credits be part of, or in addition to, the 26 credit hours required for a master of science in zoology and physiology.

**Interdisciplinary Component**

9 hours  
(see Water Resources degree requirements)

**The Willard C. and Elaine N. Rhoads Scholarship for Graduate Students in Water Resources at the University of Wyoming**

The Willard C. and Elaine N. Rhoads Scholarship for Graduate Studies in Water Resources was established to honor Willard Rhoads, a member of the Research Review and Priorities Committee for the Wyoming Water Resources Center and a long-time member of the Wyoming Water Development Commission. Funds for the Rhoads Scholarship were donated to the University of Wyoming by Mrs. Rhoads and her family and friends, with some matching funds provided by the university. Two annual awards for the academic year will be made in the amount of \$1,000 to a master's degree candidates for use in furthering research on Wyoming's water resources.



## Eligibility Requirements and Evaluation Procedures

The applicant must be accepted into the interdisciplinary water resources major program administered by the student's academic department.

The applicant must agree to take a minimum of 9 credit hours (including thesis credits) in each of the two semesters for which the award applies.

Applicants for the scholarship can apply more than once, with the exception of past recipients.

The recipient will be chosen by a selection committee appointed by the Water Resources Curriculum Committee.

Applicants meeting the eligibility requirements above will be judged on the basis of promise of academic excellence as evident in grades for graduate level courses, and a recommendation from the student's graduate adviser.

Funds for the academic year will be dispersed to the recipient equally in the fall and spring semesters for half of the total amount.

### Application Guidelines

Applicants meeting the above requirements should submit the following:

Application deadline is April 1.

A letter from the applicant listing the name of the scholarship for which he/she is applying, which includes a statement that the applicant agrees to enroll for a minimum of nine hours of graduate level courses (including thesis credits) in each of the two semesters for which the award applies, and a statement of academic and career goals related to water research. The applicant must also state the purpose for which the scholarship funds will be used.

An official transcript of grades for graduate level courses earned at the University of Wyoming or other institutions.

A note from the the academic department, verifying that the applicant has been accepted into a water resources interdisciplinary major program.

A confidential letter of recommendation from the applicant's graduate adviser addressing the applicant's promise for attaining academic and career goals through his/her research in water resources. Up to two additional letters of recommendation can be provided at the applicant's discretion.

The applicant should arrange for all materials to be sent to:

K.J. Reddy  
Chair, Rhoads Scholarship Committee  
Department of Ecosystem  
Science and Management  
Dept. 3354, 1000 E. University Ave.  
Laramie , WY 82071-3354

### Water Resources Program Executive Committee Members:

Scott N. Miller, Chair, Ecosystem Science and Management

Don McLeod, Agricultural and Applied Economics

Carol Frost, Geology and Geophysics

William Gribb, Geography

Wayne Hubert, Zoology and Physiology

Drew Johnson, Civil and Architectural Engineering

David Legg, Ecosystem Science and Management

## Professors:

**JACQUELYN BRIDGEMAN**, B.A. Stanford University 1996; J.D. University of Chicago 1999; Associate Dean for Academic Affairs and Professor of Law 2008, 2002.

**JOHN M. BURMAN**, B.A. University of Wyoming 1978; J.D. University of Minnesota 1981; Carl M. Williams Professor of Law and Ethics 1993, 1989.

**DIANE E. COURSELLE**, B.A. Fordham University 1987; J.D. Loyola University-New Orleans 1991; Winston S. Howard Distinguished Professor of Law 2006, 1999.

**JAMES M. DELANEY**, B.A. University of Washington 1985; J.D. Gonzaga University School of Law 1992; LL.M. in Taxation, University of Florida 1997; Professor of Law 2013.

**DEBRA L. DONAHUE**, B.S. Utah State University 1974; M.S. Texas A&M University 1977; J.D. University of Colorado 1989; Professor of Law 1999, 1993.

**MICHAEL DUFF**, B.A. West Chester University 1991; J.D. Harvard University 1995; Professor of Law 2012.

**STEPHEN D. EASTON**, B.A. Dickinson State University; J.D. Stanford University; Professor of Law 2009.

**STEPHEN M. FELDMAN**, B.A. Hamilton College 1977; J.D. University of Oregon 1982; J.S.M. Stanford University 1986; Jerry W. Housel/Carl F. Arnold Distinguished Professor of Law 2002.

**SAM KALEN**, B.A. Clark University 1980; J.D. Washington University 1984; Professor of Law 2014, 2009.

**TIMOTHY G. KEARLEY**, B.A. University of Illinois 1971; J.D. 1976; M.L.L. University of Washington 1977; Professor of Law and Director, Law Library 1993.

**NOAH B. NOVOGRODSKY**, B.A. Swarthmore College 1992; J.D. Yale Law School 1997; Professor of Law 2013, 2009.

**JERRY R. PARKINSON**, B.S. Northern State College 1976; M.P.A. University of South Dakota 1981; J.D. University of Iowa 1985; Professor of Law 1998.

**MARY D. PRIDGEN**, B.A. Cornell University 1971; J.D. New York University 1974; Professor of Law 1985, 1983; Carl M. Williams Professor of Law and Social Responsibility 2002.

**ALAN ROMERO**, B.A. Brigham Young University 1990; J.D. Harvard University 1993; Professor of Law 2007, 2003.

**MICHAEL R. SMITH**, B.S. Florida State University 1982; J.D. University of Florida 1985; Professor of Law 2006.

**ELAINE A. WELLE**, B.A. University of Colorado 1977; M.B.A. 1981; J.D. University of Arizona 1986; Centennial Distinguished Professor of Law 1999, 1993.

## Assistant Professors:

**KENNETH CHESTEK**, B.A. Pennsylvania State University 1975; J.D. University of Pittsburgh School of Law 1979; Assistant Professor of Law 2012.

**DANIELLE R. COVER**, B.A. University of Maryland 1994; J.D. Tulane University School of Law 1997; Assistant Professor of Law 2014; Director of Legal Services Clinic.

**CASEY D. DUNCAN**, B.A. Hillsdale College 2001; M.A. University of Missouri-Columbia 2006; J.D. University of Minnesota 2004; Assistant Professor of Law 2015; Law Library.

**MARK GLOVER**, B.A. Washington University in St. Louis 2002; J.D. Boston University School of Law 2008; LL.M. Harvard Law School 2011; Assistant Professor of Law 2013.

**DARRELL D. JACKSON**, B.A. College of William and Mary 1987; J.D. George Mason University School of Law 1990; Ph.D. University of Colorado School of Education 2011; Assistant Professor of Law 2013.

**SUZAN M. PRITCHETT**, B.A. Grinnell College 2001; M.A. University of Sussex 2004; J.D. University of Iowa 2008; Assistant Professor of Law 2015; Director of International Human Rights Clinic.

**TARA RIGHETTI**, B.A. University of Colorado Boulder 2005; J.D. 2007; Assistant Professor of Law 2014.

**JASON ROBISON**, B.S. University of Utah 2003; J.D. University of Oregon 2006; LL.M. Harvard Law School 2009; S.J.D. 2013; Assistant Professor of Law 2014.

## Academic Professionals:

**DEBORA PERSON**, B.A. Arizona State University 1981; M.L.S. Rutgers University 1992; Library Associate 1993; Administrative Law Librarian 2005, 1994.

**DONA PLAYTON**, B.S. University of Wyoming 1989; J.D. 1993; Director, Domestic Violence Legal Assistance Project; Assistant Director, Legal Services Program; Associate Lecturer 2012.

**TAWNIA PLUMB**, B.A. University of Wyoming 1996; M.L.I.S. University of Texas at Austin 1998; Electronic Services and Assistant Librarian 2004.

**TEMPLE STOELLINGER**, B.S. University of Wyoming 2004; J.D. 2010; Co-Director, Center for Law and Energy Resources in the Rockies 2013.

## Professors Emeritus

John Burman, Harvey Gelb, Joel Selig

The College of Law was founded in 1920. The goal of the college is to provide a sound and thorough education in the law that will prepare the student to practice law in accordance with the highest standards of professional competence and responsibility. The emphasis in instruction is on analysis and understanding of legal principles and the development of skills necessary to the practice of the profession. The course of study will prepare a graduate to practice in any jurisdiction which has adopted the Anglo-American system of law.

The curriculum of the College of Law consists of three years of study within the college. Required courses necessary to basic legal knowledge make up the first two semesters of study, while courses in the final four semesters are largely elective. Students become eligible to receive the Juris Doctor (J.D.) degree upon successful completion of 90 semester credit hours of law courses with a grade point average of at least 2.0.

The college acts as a law center for Wyoming. It serves lawyers, judges, and government by a program of continuing legal education for attorneys and others interested in significant legal developments, by research projects aimed at improving state law, and by publishing the Wyoming Law Review.

## Accreditation

The college is approved by the American Bar Association and its graduates are eligible for admission to the bar in every state. A student planning to practice in a particular state should check its rules for admission to the bar.

The college is also a member of the Association of American Law Schools. Membership is conditioned upon the maintenance of an adequate teaching staff and library, the offering of a sound educational program and adherence to prescribed standards for the admission and graduation of students.

## Prelegal Curriculum

There is no prescribed or required set of courses for prelegal work. A student must usually have a B.A. or B.S. degree before beginning the professional study of law. There are no restrictions on the field in which the degree is earned.

The objective of prelegal study should be to acquire knowledge and skills useful in the study and practice of law. College study should prepare the student for law school by developing language comprehension and use, understanding of political, economic, social and cultural institutions, and the ability to think logically and creatively. Courses promoting these objectives are included in the basic requirements for most undergraduate degrees. The choice of a major should be determined by the student's academic interest and professional objective in law.

Valuable background may be acquired through the study of English, history, philosophy, economics, political science, psychology, sociology, business administration, mathematics and the natural sciences.

For additional information, see the College of Law web site, ([www.uwyo.edu/law](http://www.uwyo.edu/law)).

## Admission Requirements and Procedures

Admission to the professional curriculum in law is granted by the admissions committee of the College of Law. The College of Law restricts the number of entering students to a class size consistent with its facilities and its educational objectives. In evaluating an application, the committee considers the applicant's undergraduate college scholastic record and score on the Law School Admission Test (LSAT).

Other criteria relevant to the probability of success in the study and practice of law will also be considered.

1. Prior to beginning work in the College of Law, applicants must have a bachelor's degree from an accredited college or university, unless they have requested and been granted one of the following exceptions:
  - a. An applicant who needs not more than 6 semester hours of college credit to qualify for a bachelor's degree may be admitted in exceptional cases to law school if the committee determines that the applicant has sufficient education and preparation for the study of law; has an

outstanding undergraduate scholastic record; and has an approved program signed by the appropriate undergraduate official indicating that the remaining requirements for the bachelor's degree may be met by summer school attendance or by other means that will not interfere with the study of law.

- b. In very exceptional cases, an applicant without a bachelor's degree may be admitted as a special student and become a candidate for the professional degree in law. The applicant must furnish evidence to satisfy the committee that age, experience, and training have equipped the individual to engage successfully in the study of law despite the lack of the required prelegal education.

2. Every applicant must take the Law School Admission Test. A packet giving information about the test, the dates on which it is given, and centers at which it can be taken, sample questions and an application form, may be obtained from Law School Admission Council, Box 2000, Newtown, PA 18940, by phone at (215) 968-1001, online at [www.lsac.org](http://www.lsac.org).
3. Every applicant must register with the Law School Admission Council Credential Assembly Service, CAS. Registration may be done through the LSAC website ([www.lsac.org](http://www.lsac.org)). The CAS will prepare a report that is transferred to the college.
4. Every applicant must complete the electronic University of Wyoming College of Law Application through LSAC between October 1 and March 1. Applications received by December 1 will be considered for early admission.
5. Official transcripts sent directly to the College of Law from each college attended must be on file in the Admissions Office at least 30 days before the student's registration date.

## Application Deadline

An initial entering class will be selected from completed applications on file on March 1. Students who submit an application by December 1 will be considered for early admission. An application is complete only when the college has received the LSAT score, the CAS report, and the College of Law application form. Applications completed after March 1 will be considered in filling vacancies which occur in the entering class initially selected.

## Admission With Advanced Standing

Transfer students are admitted only when the College of Law facilities and curriculum permit. A transfer student may transfer up to the number of credits the student could have earned had the student completed his or her first year at the University of Wyoming College of Law. Transfer credit will be given only for courses in which the student earned a grade of C or higher. Applicants admitted must satisfy the requirements for graduation established by the College of Law, including such other requirements as may be imposed as a condition of admission. Students interested in transferring should contact the College of Law for information concerning application procedures.

## Joint Degree Programs

The College of Law, in conjunction with the College of Arts and Sciences, offers a joint J.D./M.P.A. program. The College of Law also offers a joint J.D./M.A. in Environment and Natural Resources in conjunction with the Haub School of Environment and Natural Resources. The College of Law also offers a joint J.D./M.B.A. program in conjunction with the College of Business. For information regarding these joint degree programs, contact the College of Law.

## Nonprofessional Degree Students

Graduate students from other colleges of the University of Wyoming may be permitted to take one or more law courses on an S/U basis for non-law credit when the following conditions are met: the law course taken is acceptable for their degree program and the prior written approval of the professor assigned to the course and the Associate Dean of Academic Affairs of the College of Law has been obtained. In order to obtain audit or visitor privileges, students must obtain prior written approval of the professor assigned to the course and the Associate Dean of Academic Affairs of the College of Law. For further information and requirements contact the Associate Dean of Academic Affairs, College of Law, Dept. 3035, 1000 E. University Ave., Laramie, WY 82071.

Course descriptions may be obtained online at [www.uwyo.edu/law](http://www.uwyo.edu/law).

## Law (LAW)

**6110. Contract I. 3.** A study of the elements of simple contracts, including offer and acceptance, consideration, conditions, defenses, and damages. The impact of the Uniform Commercial Code on contracts is considered.

**6120. Property I. 3.** Covers two general areas. The first area is the rights that define property ownership, in relation to neighbors, the world, and others with interests in the property. Subjects include rights to use the land and its products, estates, concurrent ownership, and landlord-tenant law. The second area is private limitations on those rights, in the form of covenants and easements.

**6130. Torts I. 3.** A study of the methods and policies for allocating risks of harm; intentionally inflicted harms; negligence in its general aspects and its application to products liability, landowners, and automobile traffic; emotional harms; defamation; and fraud.

**6140. Criminal Law. 3.** The sources of criminal law and the purposes of criminal punishment, the constituent parts of criminal conduct, including act (or omission), culpable mental state, result, and causation. These general principles are brought to bear on homicide and sexual assault. Also considers common defenses to criminal charges, including self-defense, necessity, duress, insanity, and intoxication. Students are required to consider the constitutional limits of the criminal law and the relationship of substantive principles to practice.

**6150. Judicial Remedies. 3.**

**6160. Legal Writing I. 2.** In this course students are introduced to the fundamentals of legal reasoning and analysis and the basics of legal writing.

**6165. Legal Research. 1.** Introduction to paper and electronic resources that cover primary & secondary legal materials, including case law, statutes, agency regulations for federal and state jurisdictions, & treatises, journals, restatements, and other secondary sources. Discusses research plans and develops brief research strategies for hypothetical situations.

**6170. Introduction to Law. 1.** Provides first-semester students with an introduction to the procedures and structure of the legal system to facilitate law study during the first year of law school. Additionally, the course provides students with an introduction to preferred learning methods for efficient law school study.

**6210. Contracts II. 3.** A study of the elements of simple contracts, including offer and acceptance, consideration, conditions, defenses, and damages. The impact of the Uniform Commercial Code on contracts is considered.

**6220. Property II. 2.** First covers some private and public limitations on owners' property rights, primarily easements and zoning. The rest of the semester deals with acquiring ownership rights, possession and transfers, including the law relating to deeds and titles.

**6230. Torts II. 2.** Picks up where Torts I ends. Principal areas of coverage typically include wrongful death, defenses, vicarious liability, strict liability, nuisance, products liability and defamation. If time permits we will also cover privacy, misrepresentation and other topics.

**6240. Civil Procedure I. 3.** A study of modern practice in civil cases under Rules of Civil Procedure and other sources of procedural law. Civil Procedure I and its continuation, Civil Procedure II, cover all aspects of jurisdiction and other issues bearing on what court(s) may hear a case; choice of state or federal law; pleading; joinder of claims and parties; class actions; discovery and other pre-trial procedures; summary judgment; non-jury and jury trials; appeals; and claim and issue preclusion.

**6250. Constitutional Law I. 2.** Constitutional Law I is divided into two parts. Part I focuses on governmental structures. Part II begins our coverage of individual rights and liberties. Part I's coverage includes the power of judicial review, separation of powers, federalism, and congressional powers. Part II focuses on equal protection.

**6260. Legal Writing II. 2.** This course builds on the first semester Legal Writing course by introducing students to: (1) more sophisticated aspects of legal reasoning, analysis and legal research; (2) the basics of persuasive legal writing; (3) the basics of appellate procedure and an appellate brief; and (4) the basics of oral advocacy.

**6310. Business Organizations. 3.** Studies the law of agency relationships and business associations including partnerships, limited liability companies and corporations. Also considers the protection afforded investors by federal securities law. Listing of the above items is not intended to be all inclusive. Students are invited to consult with the instructor regarding specific information.

**6320. Income Taxation. 3.** Focuses on the federal taxation of individuals. It includes taxation of compensation, installment sales as well as taxation of gains on property transfers.

**6330. Trusts and Estates. 3.** A survey course that also serves as an introduction to Estate Planning. Covers the law of wills, trusts, and intestate succession. It also includes execution and revocation of wills; creation, modification, and termination of trusts; problems of construction; restrictions on testate transfers, transfers in trust and future interests. Covers some aspects of fiduciary administration, but not taxation. A prerequisite for Estate Planning.

**6340. Civil Procedure II. 2.** A study of modern practice in civil cases under Rules of Civil Procedure and other sources of procedural law. Civil Procedure I and its continuation, Civil Procedure II, cover all aspects of jurisdiction and other issues bearing on what court(s) may hear a case; choice of state or federal law; pleading; joinder of claims and parties; class actions; discovery and other pre-trial procedures; summary judgment; non-jury and jury trials; appeals; and claim and issue preclusion.

**6350. Constitutional Law II. 2.** Focus on constitutionally protected individual rights and liberties. Specifically, the following topics will be covered: substantive due process, including the right of privacy; procedural due process; freedom of expression; and religious freedom.

**6410. Evidence. 3.** A study of the means by which any alleged fact is established or disproved, including competency of witnesses; direct examination; cross-examination and impeachment; privileges; basic and special issues of relevancy; the hearsay rule and its exceptions; real, demonstrative, and documentary evidence; opinion and scientific evidence; judicial notice; and the responsibility of proof.

**6420. Professional Responsibility. 3.** A study of the duties of attorneys to their clients and the public under the Model Rules of Professional Conduct and case law.

**6490. Taxation of Partnerships and other Pass-Through Entities. 3.** A study of the income taxation of the formation, operation, and termination of partnerships, with particular emphasis on the regulation of the allocation of income, losses, and liabilities among partners. Also, the taxation of the shareholders of S Corporations.

**6500. Agricultural Law. 2.** Presents the opportunity to look at a number of different types of law applied in the specific context of agriculture. Includes a section discussing various property/contract issues such as agricultural land leases and farm tenancies. Also includes discussions on employment and soil and water management and involves an examination of interesting labor, conservation and pollution questions raised by agricultural operations.

**6510. Administrative Law. 3.** A review of administrative law practice and procedure, primarily at the federal level. The course begins with materials on the nature and function of administrative agencies. Agency rulemaking power, emphasizing federal and state Administrative Procedure Act (APA) requirements. Considers the adjudicative powers of administrative agencies, including an agency's obligation to afford persons due process of law. Finally, the course examines judicial review of administrative agency decisions.

**6520. Advanced Appellate Advocacy. 1.** Builds on the first semester Legal Writing course by introducing students to: (1) more sophisticated aspects of legal reasoning and analysis; (2) more sophisticated aspects of legal research; (3) the basics of persuasive legal writing; (4) the basics of appellate procedure; (5) the basic parts of an appellate brief; and (6) the basics of oral advocacy.

**6530. American Legal History. 3.** A study of the life of John Marshall, Chief Justice of the United States from 1801 until 1835.

**6540. Antitrust. 3.** The study of the federal laws regulating monopolies and restraints of trade. The substantive provisions of the antitrust laws are relatively brief - there are only three main statutes - the Sherman Act (1890), the Clayton Act (1914) and the FTC Act (1914). These statutes entail broad prohibitions, and there are no detailed regulations like the tax code.

**6550. Bankruptcy. 2.** A survey of the Federal Bankruptcy Act. Includes consideration of liquidation, reorganization, family farmers, debts of individuals, and the relationship of bankruptcy law and proceedings to Article 9 of the Uniform Commercial Code and the law of mortgages.

**6560. Business Planning. 3.** Focus is primarily on a problem involving several persons who are organizing a business entity. Consideration will be given to the characteristics of several kinds of business organizations and to making a judgment as to which organization should be used to house the business being set up. Considers tax and non-tax aspects with respect to business organizations.

**6565. Civil Pretrial Practice. 3.** Includes the civil litigation process from the filing of a complaint and decisions related to the complaint, to discovery including written discovery and depositions, to pre-trial motions such as motions to change venue, to exclude evidence, and for summary judgment, to preparation for pre-trial conferences and trial. Sample cases provide the basis for the drafting of various discovery documents and motions. There will be no exam.

**6570. Payment Systems. 3.** Focus on the use of negotiable instruments (such as checks, drafts, promissory notes, and certificates of deposit) to document debts and to make payments. Provides an overview of the banking system, the check collection process, and the use of various commercial instruments. Topics include liability for stolen checks, forged signatures, alterations, payment to impostors, insufficient funds, stop payment orders, post-dated checks, and restrictive endorsements. In addition, the rights of good faith purchasers are examined and the use of third parties (such as guarantors, sureties, and accommodation parties) to secure obligations are discussed.

**6580. Communications Law. 3.** Covers the law applying to the electronic media, including broadcast licensing, the fairness doctrine in broadcasting, cable television regulation, regulation of new communications technologies such as the Internet, and the regulation of telecommunications. The latter topic will include the breakup of AT&T, as well as the 1996 Telecom act.

**6590. Conflict of Laws. 3.** The study of the law applicable to transactions or occurrences involving contacts with more than one state, including questions of choice of law, jurisdiction, and recognition of foreign judgments. The casebook is: David P. Currie, Herma Hill Kay & Larry Kramer, *Conflict of Laws: Cases -- Comments -- Questions*, Sixth Edition (West 2001).

**6600. Consumer Protection. 3.** Covers three main topics: (1) the law of advertising and marketing; (2) consumer credit regulation; and (3) consumer warranty law.

**6615. Taxation of Business Entities. 3.** Surveys the federal income tax consequences of major events in the existence of business entities and their owners including formations, contributions, operations, distributions, redemptions, and liquidations. Compares taxation of Subchapter C corporations, Subchapter S corporations, and partnerships. Students spend significant time on statutory interpretation and along the way consider policy issues that affect how the taxation of businesses is structured and enforced under the Internal Revenue Code.

**6620. Bankruptcy Law. 3.** After briefly surveying state collection laws, considers the impact of federal bankruptcy law on secured and unsecured creditors. The primary focus of the course is on consumer bankruptcy under Chapter 7 (liquidations) and Chapter 13 (reorganizations). Concludes with an introduction to Chapter 11 (business reorganizations).

**6630. Criminal Procedure. 3.** Examines the constitutional rights of criminal suspects and defendants under the 4th, 5th and 6th Amendments of the United States Constitution. Much of the focus is on law enforcement practices and the constitutional principles that constrain the police.

**6635. Domestic Violence Law. 3.** Helps prepare students to take part in the Legal Services Program, which has been expanded to include a Domestic Violence Legal Assistance Project.

**6640. Family Law. 3.** From marriage to divorce, property distribution, child custody and the termination of parental rights, explores the many areas and facets of family law with an eye toward providing students with a firm doctrinal grounding, while preparing them for what they will face as they enter into practice. In the context of this exploration we look closely at many of the cultural issues noted above, and the effects those issues are having not just on the family and the law related to the family, but on society as a whole.

**6645. Children and the Law. 3.** Covers a range of children's issues, including: dependency; termination of parental rights; adoption, child custody and support; parental rights; and the juvenile justice system. It is suitable for students considering a career in child advocacy, or who have any interest in the subject of juvenile law. Prerequisite: completion of first year of law school.

**6650. English and Scottish Legal History. 2.** The goal is to give students a better understanding of how our law came to be as it is, through study of a revolutionary age. Scots law is included with English law to provide perspective on how a kindred legal system developed. Students will assist in planning the particulars of the course, and will make presentations on the assigned subjects for study. One or more papers will be required. Students may satisfy the College of Law advanced writing requirement in the submission of the papers.

**6660. Environmental Law. 3.** Provides an overview of the broad field of environmental law, with an emphasis on the major federal environmental statutes such as the National Environmental Policy Act, the Endangered Species Act, the Clean Air and Clean Water Acts, and statutes regulating both hazardous wastes and toxic chemicals in commerce. In considering these various statutes, we consider both their substantive requirements and their conceptual approaches to environmental protection. Touches briefly on issues such as the role of states in implementing these national laws, various approaches to enforcement of

these laws, common-law doctrines relevant to environmental protection, and economic aspects of environmental law.

**6670. Estate Planning. 2.** Applies estate and gift tax principles in a survey of estate planning principles and techniques. Traditional estate planning tools including wills, trusts, and durable powers of attorney are discussed as well as post-mortem planning, administration issues, and planning for special situations, such as owners of closely held businesses, entrepreneurs, and the disabled.

**6675. Gift and Estate Taxation. 2.** Focuses on the federal estate and gift tax consequences of wealth transfers. Students learn to analyze the federal estate and gift tax section of the Internal Revenue Code. *Prerequisites:* income taxations, trusts and estates.

**6680. Federal Courts. 3.** Examines the themes of separation of powers and federalism by scrutinizing the jurisdiction of the federal courts. Covers justiciability doctrines (standing, ripeness, and mootness), congressional power to control federal court jurisdiction, constitutional and statutory parameters of federal question jurisdiction, federal common law, basic contours of litigation under 42 U.S.C. 1983, state sovereign immunity and the Eleventh Amendment, and the various abstention doctrines.

**6700. Indian Law. 3.** Surveys the law that applies to Native Americans and tribal governments. Deals primarily with federal law because of the unique relationship between the federal government and tribes, which are sovereign entities, and because federal law controls most Native American activities. The main issues are jurisdictional; that is, they concern the allocation of legislative (or regulatory) and judicial (both civil and criminal) jurisdiction among federal, tribal, and state governments.

**6710. Insurance Law. 2.** Discussion of all types of insurance from the point of view of an attorney advising clients and of a consumer. It is relevant and important for those going into any aspect of the law as insurance is involved in most law from business to litigation to domestic to estate planning. Covers standard insurance policy language, as well as case law and practical ideas for dealing with insurance.

**6715. Immigration Law. 3.** Practical approach to topics such as the standards for admission of immigrants; nonimmigrant visas for students, workers and tourists; regulation and exclusion of undocumented aliens; legal procedures for admission, exclusion and deportation; refugee law; and citizenship law. Additionally, legislative history and policy

behind applicable legislation and case law is discussed. *Prerequisites:* completion of the first year of law school.

**6720. International Law. 3.** Covers international law in its classic sense--public international law, or "the law of nations" as it's referred to in the Constitution. Looks at topics such as the sources and evidence of international law, sovereignty, the relationship of international law to national law, the bases of national jurisdiction, the international use of force, human rights, etc. However, modern public international law also includes areas of more immediate interest to practicing lawyers, such as conflicts between nations over which one has the right to assert jurisdiction over certain activities, international extradition, and immunities from jurisdiction.

**6725. Intellectual Property. 3.** Introductory overview of principles of intellectual property protection particularly trademark, copyright and patent law. USA law will be integrated into a comparative analysis of International intellectual property law.

**6730. Jurisprudence. 3.** Examines American legal thought from the nation's inception through today. Discusses issues related to the nature of law, the nature of judicial decision making, the relationship between law and society, and the like.

**6735. Native American Natural Resources Law. 3.** Examines federal and tribal law, (chiefly statutes, regulations, cases and treaties), governing environmental regulation and management of tribal land water minerals, fish and wildlife, and cultural resources. Explores the federal trust doctrine, aboriginal title, reserved rights, allotment, and the tribes-as-states-doctrine.

**6740. Labor Law. 3.** Deals with labor law in the private sector. Surveys the establishment of a collective bargaining relationship between employers and unions, the subsequent negotiation of a collective bargaining agreement resulting from that relationship, the administration of that agreement through its grievance-arbitration provisions, and the economic weapons used by parties to various kinds of labor conflicts.

**6745. Employment Law. 3.** Examines a variety of laws, regulations and legal theories governing the workplace and the employment relationship. In particular we look at the at-will doctrine and its exceptions, rules affecting the establishment of the employment relationship and rules affecting the termination of the employment relationship.

**6750. Law and Economics. 2.** The use of microeconomic theory to assess the economic efficiency and equity consequences of alternate legal structures.

**6755. Legislation. 3.** Examines how statutes are made and applied. Priorities are 1) legislative process in Congress and the state legislatures (especially Wyoming), and; 2) statutory interpretation tools and techniques.

**6760. Local Government Law. 3.** Examines the organization, powers, responsibilities, liabilities and financing of units of local government, including counties, cities, school districts and other special districts. Interrelationships among local governments, the states and the federal government are studied. Leading judicial decisions as well as state and federal constitutional and statutory provisions will be assigned. Particular emphasis is placed on the law of Wyoming and other western states.

**6765. International Business Transactions. 3.** Overview of international business transactions involving private entities engaged in global commerce. Examines legal framework associated with planning, implementation, and enforcement of international agreements concerning sale of goods, trade of services, and transfer of technology. Impact of relevant international organizations and emerging substantive international commercial law with social obligations of multinational enterprises. *Prerequisite:* completion of first year of law school.

**6775. International Human Rights. 3.** An examination of norms, institutions and problems relating to international human rights law. Addresses civil and political rights questions (including the expanded use of international criminal law as a means of enforcing universal values), social and economic rights (including access to medicines) and select group rights issues. *Prerequisites:* completion of the first year law school curriculum.

**6780. Mining Law. 2.** An in-depth review of the law governing mineral development in the western United States. The first part of the course focuses on hardrock minerals governed by the General Mining Law of 1872 and related regulations. The second part will cover the regulation of energy minerals such as oil and gas under the Mineral Leasing Act of 1920 and related laws and regulations, as well as the development and regulation of coal mining under the Surface Mining Control and Reclamation Act (SMCRA). The third part will analyze the unique aspects of federal and state environmental laws as they relate to mineral development operations, including constitutional issues such as federal and state preemption and takings.

**6790. Oil and Gas. 3.** A study of the law regarding private property interests in oil and gas. Subjects include the acquisition, transfer, lease, and assignment of oil and gas interests; rules and contracts governing the relationships among surface owners, oil and gas lessors, oil and gas lessees, and neighboring owners; and government regulation.

**6800. Public Lands. 3.** Examines the law governing management of the federal public lands/national parks, national forests, wildlife refuges, BLM lands, etc. Among other laws, we study NEPA, General Mining Law of 1872, Mineral Leasing Act of 1920, National Forest Management Act of 1976, Taylor Grazing Act, Federal Land Policy and Management Act, Endangered Species Act, and Wilderness Act. In addition to examining Congress' prescriptions for public land management and the constraints it has imposed on land managers, the course also explores how the public and politics influence public land policy and decision making.

**6810. Real Estate Finance. 3.** Begins with some study of the law and practice relating to real estate transactions, deeds, and titles. The rest of the semester covers the law and practice relating to mortgages, foreclosure, and other financing issues in residential and commercial real estate transactions.

**6830. Secured Transactions. 3.** Financial institutions and other businesses often take an interest in a debtor's personal property (such as goods, equipment, inventory and accounts) to secure payment of a debt or performance of an obligation. Deals with the law governing security interests in personal property which is embodied primarily in Article 9 of the Uniform Commercial Code.

**6835. Law of Electronic Commerce. 3.** Covers the novel legal issues arising in relation to the Internet, electronic commerce, and online services. The issues include evolving rules and practices related to personal jurisdiction, electronic contracting, intellectual property, privacy, communications, governmental regulation, payments, taxation, and fraud prevention. *Prerequisite:* completion of first year of law school.

**6840. Securities Regulation. 3.** Considers the responsibilities and liabilities of a company and various persons involved in the public offering of securities, including the filing of a registration statement, and other disclosure matters. Deals with the definition of the term "security" and possible exemptions for securities offerings. Covers securities fraud under SEC Rule 10b-5 including, *inter alia*, insider trading. Corporate disclosure requirements in connection with matters such as proxy rules

and in other contexts are also considered. Some attention is given to disclosure requirements in connection with mergers and acquisitions, takeovers, and tender offers.

**6850. Trial Practice. 3.** Trial Practice is a rigorous learn-by-doing course designed to build courtroom skills. Through a combination of exercises, lectures, demonstrations, drills and complete trials, students are prepared to advocate before judges and juries. The first half of the course focuses on basic examination and exhibit skills, including direct, cross, redirect, making and responding to objections, and the introduction and use of real and demonstrative evidence. In the sixth week, students conduct bench trials. The second half of the course builds on the basic skills and covers advanced ones, including examination of expert witnesses, opening statement, closing argument and *voir dire*. Jury trials are conducted in the final two weeks.

**6860. Water Rights. 3.** A study of the allocation and reallocation of water resources with particular emphasis on prior appropriation systems in the Western United States. Riparian systems and groundwater management are also addressed, along with interstate conflicts, federal water rights, federal-state relations, and the effect of environmental laws on water allocation and the exercise of water rights.

**6865. Natural Resources Law. 3.** Comprehensive view of the general law governing natural and environmental resources. Students will learn to understand how our legal system has organized the various problems of allocation, use rights, duties and limitations, and governance, in the context of establishing rules governing human use of the earth's natural endowment. *Prerequisite:* completion of first year of law school.

**6870. Water Pollution. 3.** An overview of the practice and procedure of the subfield of environmental law dealing with water pollution control. Focuses on federal law, specifically the Federal Water Pollution Control Act, or Clean Water Act, regulations promulgated by the U.S. Environmental Protection Agency and Army Corps of Engineers, and case law construing the statute and rules. Considers statutory structure, legislative intent, administrative discretion, and mechanisms for state-federal coordination.

**6875. Hazardous Waste and Water Pollution Law. 3.** Examines the Clean Water Act, Resource Conservation and Recovery Act, and the Comprehensive Environmental Response, Compensation, and Liability Act. These highly complex federal statutes, applicable nationwide either directly or via state-implemented programs, regulate pollution of water; govern

industrial generation, handling, and cleanup of hazardous substances; and establish liability and enforcement standards.

**6880. Criminal Adjudication. 3.** A study of the post-investigative phase of the criminal process: from charging decisions through sentencing and appeals. Topics covered include: the decision to prosecute; bail and pretrial release; grand jury and preliminary hearing practice; jury-related issues, such as pretrial publicity, Batson, and deliberative secrecy; criminal discovery; the role and responsibilities of defense counsel and of the prosecutor; defendants' rights to presence, confrontation, and to present a defense case; verdicts; sentencing and appeals.

**6885. Law Office Management. 1.** This is a "how-to" course which introduces students to the law office as an operating business. This course covers various aspects of establishing and operating a law office, including: attorney timekeeping and client billing; establishing fees rates and fee agreements; revenue projections, record and file management and conflict management systems. *Prerequisites:* completion of the first year law school curriculum.

**6890. Land Use Law. 3.** Deals primarily with public methods of making decisions concerning the use and development of land. Land use decisions range from the issuance of building permits or variances to zoning to long-range planning. Examines tensions between private and public interests (private landowners, community residents, developers, business persons, and city/county officials) over the use of private property, the legal principles that inform the possible resolutions of these tensions and define governmental authority, and the implications of land use regulation for the exercise of other rights, such as free speech.

**6910. Seminar. 1-2.**

**6915. Topics in Law. 1-3.** Specific subject matter varies each year and between each section because the course is normally taught by a visiting faculty or by a law faculty member or interdisciplinary team who wish to present a special topic not able to be offered on a regular basis. Students should check class schedules for current offerings each semester. *Prerequisite:* completion of first year of law school; consent of instructor required for non-law students.

**6920. Legal Skills and Problems. 1-2.**

**6925. Advanced Persuasive Writing. 3.** Art and science of written legal persuasion. Specifically, course explores the nature of legal persuasion from the standpoints of numerous disciplines, including classical rhetoric, psychology, literary theory, and morality theory, and based on these principles, covers specific strategies lawyers can use to make their writ-

ing more persuasive. *Prerequisites:* LAW 6160 and LAW 6260, and completion of first year of law school.

**6930. Legal Clinic. 2-3 (Max. 6).** Supervised clinical training in law office and court procedures. Clinical programs available are the Defender Aid Program, Legal Services Program, and the Prosecution Assistance Program. *Prerequisite:* Students must have completed first year of law school.

**6935. Contract Drafting. 3.** Covers fact investigation and the role of the lawyer in a transaction proposed by the client, including possible negotiations with other parties; drafting a contract in Plain English; and the ethical obligations of a transactional lawyer, through simulations and problem-solving exercises. *Prerequisite:* LAW 6110.

**6940. Independent Study. 1-2.** Research and writing in specialized or advanced areas of the law. Students are to contact a professor that has a background or interest in the students' topic area to determine if the professor will supervise the Independent Study. Students receive one credit hour for 50 hours of work or 2 credit hours for 100 hours of work.

**6945. Workers Compensation Law. 3.** Addresses essential aspects of workers' compensation laws including extent of coverage, the various levels and varieties of benefits provided, and how claims are established and enforced. The course will also consider the interaction of state workers' compensation laws with other laws.

**6950. Law Review. 1-3.** Intensive research, writing, and editing of case note or comment and cite-checking of articles for the Wyoming Law Review. Satisfactory/unsatisfactory only. Law Review membership is required. Credit may be received in the third year only. Maximum six hours in academic career.

**6960. Legal Externships. 1-3.** The externship program provides second and third year students with an opportunity to learn through practice by working directly with attorneys or judges for academic credit. Externship placements are limited to judges, government agencies and nonprofit organizations, and must be pre-approved by the College of Law faculty.

**6970. Legal Competitions. 1-3 (Max. 3).**

**6980. Advanced Business Organizations. 3.** Considers the structure and governance of business organizations, owner informational rights, proxy voting and regulation, and shareholders derivative and direct suits. Attention will also be given to business combinations, sales of control, fiduciary duties of controlling persons, tender offers, the issuance of shares and debt obligations, distributions and redemptions. The above should be regarded as a general description of the course but is not intended to be all inclusive. Students are invited to consult with the instructor regarding specific information relative to this course.

**6990. Advanced Topics. 3.**



# Armed Forces Services

LTC Mitchell K. Day, Commander, Army ROTC  
 LtCol. Tay W. Johannes, Commander, Air Force ROTC

It has been the consistent policy of the university in cooperation with the federal government to make courses in military science and aerospace studies available on a voluntary basis to all qualified students.

Academic credits for Army and Air Force Reserve Officers' Training Corps (ROTC) are applied toward baccalaureate and graduate degrees in varying amounts depending upon the degree plan of the student and as determined by the college concerned.

## Army ROTC

Department of Military Science

207 Wyoming Hall, 766-3390

FAX: (307) 766-3383

Web site: [www.uwyo.edu/armyrotc](http://www.uwyo.edu/armyrotc)

### Professor:

**MITCH K. DAY**, Lieutenant Colonel, U.S. Army, Military Police; B.S. Western Oregon State College 1992; M.S. 1993; Professor of Military Science 2011.

### Lecturers:

**TIMOTHY HAMILTON**, Sergeant First Class, U.S. Army; Military Science Instructor 2014.

**ERICH MARTIN**, Master Sergeant, Senior, U.S. Army; Military Instructor 2013.

The Department of Military Science - Army ROTC faculty is composed of U.S. Army officers and senior noncommissioned officers. These officers hold bachelors' and masters' degrees in a variety of fields. Noncommissioned officers hold associate degrees in a variety of fields. Officers' military education includes completion of the Officer Basic Course and the Officer Advanced Course. Several faculty are graduates of the Army's Command and General Staff College and have completed military specialty schools such as: Flight School, Ranger School, Airborne School, Air Assault School, Special Forces School, Jumpmaster Course, Special Operations Training and Language School.

### General Information

Army ROTC is a program which offers qualified college students the opportunity to graduate as officers and serve tours in the U.S. Army, the Army National Guard or the U.S. Army Reserve.

The four-year program is divided into two parts called the basic course and the advanced course. The basic course, consisting of 8 credit hours, is usually taken during the first two years of college. No military obligation is incurred by enrolling in the basic course.

The advanced course, usually taken during the junior and senior years or during graduate school, involves 19 credit hours of study and a five-week Leadership Development and Assessment Course during the summer. Advanced course students incur a military obligation, and they receive up to \$500.00 per month in tax-free subsistence throughout the academic year.

Army ROTC is not itself a major. Participants pursue the degree of their choice and take Army ROTC as an elective program. Those who complete the program may receive federal commissions from the President of the United States.

Army ROTC offers a military science minor. Effective with the Fall 2015 semester, the requirements for a minor in military science are as follows:

ARMY	1010	.....2
ARMY	1020	.....2
ARMY	2010	.....2
ARMY	2020	.....2
ARMY	3010	.....3
ARMY	3020	.....3
ARMY	3025	.....1
ARMY	3030	.....3
ARMY	4010	.....2
ARMY	4020	.....2
ARMY	4015	.....1
ARMY	4025	.....1
HIST	2020	.....3
<b>Total credit hours</b>		<b>27</b>

### Or

ARMY	2050	.....3
ARMY	3060	.....1
ARMY	3010	.....3
ARMY	3020	.....3
ARMY	3025	.....1
ARMY	3030	.....3
ARMY	4010	.....2
ARMY	4020	.....2
ARMY	4015	.....1
ARMY	4025	.....1
HIST	2020	.....3
ARMY	4016	.....1
ARMY	4026	.....1
ARMY	4050	.....2
<b>Total credit hours</b>		<b>27</b>

The military science minor, encompassing 27 credit hours, will prepare selected students for commissioning and establish a sound basis for their future professional development.

To be eligible for a commission, U. S. citizens must meet prescribed physical, intellectual, and moral standards in addition to completing Army ROTC studies and successful completion of Professional Military Education (PME) courses. These PME courses include written communication skills, military history and computer literacy. A two-year option is available for sophomore and junior students, students with prior military service (see below), and those completing a masters program.

In the Army ROTC classroom the student is exposed to a wide variety of subjects designed to instill confidence, self-discipline, integrity and responsibility. Students gain an appreciation for the role of national defense, and learn what a leader must be, know and do in order to gain the respect and support of their subordinates.

Skills learned in Army ROTC, including resource management, leadership and planning are valuable and complement any university major. Young commissioned officers returning to civilian sectors after military service find an abundance of career opportunities.

### Uniforms, Pay and Allowances

All uniforms, books and other instructional materials required in Army ROTC are provided to basic and advance course students at no cost. The cadet uniform is the same as the U.S. Army uniform except for the distinctive ROTC insignia.

Advanced course participants are paid a tax-free subsistence allowance of up to \$500.00 per month during the school year. During the summer training period students receive pay, travel, rations, quarters, clothing, and medical and dental services.

### Two Year ROTC Program

The two-year program is designed for community college graduates and university students of sophomore or junior standing who did not take Army ROTC during the first two years of school. The program may also apply to seniors and graduates who have at least two years remaining in post graduate study.

To enter the two-year program, students must first attend a paid 28-day internship during the summer or be a veteran who has graduated from advanced individual training.

**Special Scholarship Program**

Two-, three-, and four-year scholarships are offered by Army ROTC. These scholarships pay full tuition, laboratory fees and a \$1200 per year book fee. While on scholarship, the student receives up to \$500.00 a month during the school year. In addition to active duty scholarships, Army ROTC offers scholarships to students wishing to join the U.S. Army Reserve or Army National Guard upon commissioning. These reserve scholarships also pay full tuition, laboratory fees, book fees, and up to \$500.00 a month. Graduate students and undergraduate students are eligible to apply for the two- and three-year scholarships. These scholarships are awarded by the Professor of Military Science. Students do not have to be enrolled in ROTC to apply for these scholarships. Certain restrictions apply. High school juniors and seniors seeking a four-year scholarship should contact the Professor of Military Science, Army ROTC, Dept. 3167, 1000 E. University Ave., Laramie, WY 82071. College students desiring a scholarship should contact the Professor of Military Science in 154 Wyoming Hall, (307) 766-3390.

Scholarships are offered to ROTC cadets from several military associations. The Reserve Officers Association (ROA), Association of the U.S. Army (AUSA), Cowboy Battalion Alumni Association (CBAA), the United Services Automobile Association (USAA) and First Command offer annual cash awards to ROTC cadets.

Room and board scholarships are available to students who enroll in Army ROTC. Scholarship awards are based on merit and the student's potential to become a commissioned officer. The number of scholarships and dollar amount vary dependent on funds available. Room and board scholarships may only be used in UW residence halls or university apartments.

**Leadership Laboratory**

Leadership laboratory provides instruction that complements the classroom. This time provides practical application on subject matter taught in class. Leadership and management dynamics are inherent in this practical application. All students enrolled in a military science course must enroll in the appropriate leadership laboratory unless consent is obtained from the Professor of Military Science. Training

includes land navigation, first aid, communications, basic rifle marksmanship, drill and ceremonies, decision making, squad movement and problem solving. This instruction is cadet planned and presented with immediate instructor feedback. The goals of this period are to instill self-confidence, self-discipline and responsibility in each cadet.

Land navigation skills are practiced in a variety of terrain locations near campus. The training instills trust and confidence in the cadet's ability to accurately plot and follow a compass course. Communication, such as radio, telephone and interpersonal skills, are taught and practiced. Marksmanship is taught in the Half-Acre rifle range and on other ranges, weather permitting. Finally, drill and ceremonies teaches methods of organizing and moving groups of individuals in an orderly manner resulting in team building while establishing esprit de corps.

**Veterans' Option**

Veterans of active military service and members of the National Guard or U.S. Army Reserve may qualify to go directly into the advanced Army ROTC program if they will be an academic junior. In these cases, basic training fulfills the requirement of the first two years of ROTC (Basic Course). Academic freshmen and sophomores are not required to take basic course classes but are highly encouraged to do so. It is common for members of the National Guard to study to become commissioned officers via the ROTC program. The Simultaneous Membership Program (SMP) is a formalized program for advanced course Guard members and Reservists to combine their unit training with ROTC training. In many cases the SMP program will result in increased financial benefit to the individual.

**Military Obligation**

There is no military obligation for taking the basic course, freshman and sophomore years. When an individual starts the advanced course, he or she incurs an obligation. The nature of that obligation depends upon whether the individual elects to serve in the National Guard, the Army Reserve or the active Army, and whether the individual has an Army scholarship. Those who desire guard or reserve duty may contract specifically for that purpose. The guard and reserve obligation is eight years of monthly training meetings and two years of inactive ready reserve (IRR). The active duty obligation is four years Active duty, and four years of inactive ready reserve (IRR).

**Extracurricular Activities**

Army ROTC offers a variety of activities which are designed to promote an interest in the military and provide relaxing, enjoyable leisure activities for cadets.

The Cowboy Battalion has its own Ranger Challenge team, which is a varsity-level team that competes with other universities in military skills such as orienteering and soldier skills. The battalion also has a cannon crew, mounted color guard, 10-miler team, Bataan Death March team, and participates in intramural sports.

The department periodically sponsors other activities such as rappelling demonstrations, ranger weekends, battlefield tours, leadership exercises and other adventure training, such as mountaineering, land navigation exercises, patrolling and wilderness survival.

**Suggested Course Sequence**

<b>FRESHMAN YEAR: Fall</b>		<b>Hrs.</b>
ARMY 1010	.....	2
Lab (mandatory)	.....	0
PEAC 1272 (voluntary)	.....	1/2
PEAC 1001	.....	1
ARMY 3060 (voluntary)	.....	1

<b>FRESHMAN YEAR: Spring</b>		<b>Hrs.</b>
ARMY 1020	.....	2
Lab (mandatory)	.....	0
PEAC 1272 (voluntary)	.....	1/2

<b>SOPHOMORE YEAR: Fall</b>		<b>Hrs.</b>
ARMY 2010	.....	2
Lab (mandatory)	.....	0
PEAC 1272 (voluntary)	.....	1/2
ARMY 2060 (voluntary)	.....	2
ARMY 3070 (voluntary)	.....	2

<b>SOPHOMORE YEAR: Spring</b>		<b>Hrs.</b>
ARMY 2020	.....	2
Lab (mandatory)	.....	0
PEAC 1272 (voluntary)	.....	1/2
HIST 2020 (mandatory)	.....	3

<b>JUNIOR YEAR: Fall</b>		<b>Hrs.</b>
ARMY 3010	.....	3
Lab (mandatory)	.....	0
PEAC 1272 (mandatory)	.....	1/2
ARMY 3025 (mandatory)	.....	1
ARMY 3070 (voluntary)	.....	2

<b>JUNIOR YEAR: Spring</b>		<b>Hrs.</b>
ARMY 3020	.....	3
Lab (mandatory)	.....	0
PEAC 1272 (mandatory)	.....	1/2
ARMY 3026 (mandatory)	.....	1

<b>SENIOR YEAR: Fall</b>		<b>Hrs.</b>
ARMY 4010	.....	2
Lab (mandatory)	.....	0
PEAC 1272 (mandatory)	.....	1/2
ARMY 3030 (voluntary)	.....	3
ARMY 4025 (mandatory)	.....	1
ARMY 4015 (mandatory)	.....	1
ARMY 4050 (voluntary)	.....	2
ARMY 3070 (voluntary)	.....	2
<b>SENIOR YEAR: Spring</b>		<b>Hrs.</b>
ARMY 4020	.....	2
Lab (mandatory)	.....	0
PEAC 1272 (mandatory)	.....	1/2
ARMY 4026 (mandatory)	.....	1
ARMY 4016 (mandatory)	.....	1

## Military Science (ARMY)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

**1010. Introduction to Military Science. 2.** Encompasses dynamics of leadership applicable to all careers through instruction in Rifle Marksmanship; Land Navigation; Leadership Laboratory; Field Training Exercises; U.S. Army Customs, Courtesies and Career Opportunities and various leadership dimensions.

**1020. Dynamics of Leadership II. 2.** Second semester of a one-year series. Continues ARMY 1010.

**2010 [2030]. Leadership Skills and Management. 2.** Studies principles and theories of leadership and team dynamics. Develops student leadership potential through the study of the values and attributes of effective leaders. Students gain self-confidence through the application of principles and techniques of leadership in a military environment. *Prerequisite:* ARMY 1010, 1020 or consent of instructor.

**2020 [2040]. Leadership Skills and Small Unit Management. 2.** Studies principles in small-unit management, tactics, operations and leadership. Develops students' self-confidence in their leadership ability through progressive application of knowledge, decision making, communication and control. *Prerequisite:* ARMY 2010 or consent of instructor.

**2050. Internship: Leader's Training Course. 3.** A four week leadership practicum which orients students to U.S. Army, trains them in basic military skills, develops and evaluates their officer leadership potential, and qualifies them for enrollment in the ROTC Advanced Course Program. Increases confidence, self-discipline and decisiveness through physical and academic challenges. *Prerequisite:* sophomore standing or above.

**2060. Competent and Confident Leadership. 2.** Interdisciplinary course whose aim is to encourage assessment of our obligations, commitments, and roles in society by inquiring into the nature of leadership and the responsibilities of both leaders and followers. Examines leadership traits that transcend the military aspect of leadership.

**3010. Leadership and Tactics I. 3. [O♦(none)]** Studies leadership techniques and tactical operations at the small-unit level. Instruction covers the decision-making process, troop leading procedures, land navigation and operation orders. In-depth analysis of team/squad tactical procedures and techniques. Numerous student oral presentations and practical exercises. *Prerequisites:* ARMY 2010, 2020, basic camp or consent of department head.

**3020. Leadership and Tactics II. 3.** Studies platoon-level tactics and leadership techniques. Instruction covers the solving of complex tactical problems. Illustrates techniques for properly managing personnel, resources and time to accomplish organizational goals. Introduces Army staff functions and prepares students for successful completion of ARMY 3030. *Prerequisite:* ARMY 3010.

**3025. Conduct of Training. 1.** Introduces the Army's system of conducting training exercises. Covers prerequisite training, pre-execution checks, officer/NCO responsibilities, training presentation techniques, sustainment training and training assessment. *Prerequisite:* consent of instructor.

**3026. Assessment of Training. 1.** Introduces the Army's system of training assessment. Covers formal and informal after-action reviews (AARs); preparation for, conduct of, and goals of an AAR; and writing of Army after-action reports. *Prerequisite:* consent of instructor.

**3030. Practicum in Leadership. 3.** Encompasses Leadership Development and Assessment Course, a five week test of the cadet's leadership ability. Each cadet is evaluated in ten different positions. Positions include both garrison and tactical situations. Each position requires the cadet to plan, implement and execute a wide variety of tasks. The cadet must control all personnel under this command. The cadet is extensively evaluated by cadre Tactical Officer/Non-commissioned Officer on twelve leadership dimensions. Successful completion of the Leadership Development and Assessment course is required for commissioning. *Prerequisites:* successful completion of ARMY 3010 and 3020.

**3050. Army ROTC Nurse Summer Training Program. 3.** Allows Army ROTC nursing cadets to obtain college credit for nursing

experience gained in an army hospital during nurse summer training program. Students practice military skills, leadership, clinical nursing, administrative and interpersonal skills. *Prerequisites:* ARMY 3010, 3020.

**3060. Military Skills Practicum: Ranger Challenge. 1-4 (Max. 4).** Encompasses training and intercollegiate competition in fundamental military skills. Students learn and compete in areas of physical conditioning training, land navigation, rifle marksmanship, rope bridging and other skills practiced during small-unit military operations. *Prerequisite:* consent of department or instructor.

**3070. Cadet Professional Development Practicum. 2.** Consists of attendance as an Army ROTC cadet at an Army specialty producing school including Airborne, Air Assault, Northern Warfare School or Mountain Warfare School. Offered for S/U grade only. *Prerequisites:* ARMY 1010, 1020, 2010 and 2020 and/or consent of department head.

**4010 [4030]. Dynamics of the Military Organization I. 2.** Studies and analyzes organization, resources and functions of military staff. Reviews formal staff problem-solving procedures, including student effective writing and briefing presentations. Introduces ethics and the military profession. *Prerequisites:* ARMY 3010, 3020 or consent of department head.

**4015. Staff Officer Practicum I. 1.** Gives students practical experience in serving on an Army staff. Under supervision of an Army ROTC cadre member, students undergo training and conduct practical exercises in one of the following specialties: command and control, operations, personnel or logistics. *Prerequisite:* concurrent enrollment in ARMY 4010.

**4016. Staff Officer Practicum II. 1.** Gives students experience in serving on an Army staff. Under the supervision of an Army ROTC Cadre member, students undergo training and conduct practical exercises in one of the following specialties: command and control, operations, personnel or logistics. *Prerequisite:* concurrent enrollment in ARMY 4020.

**4020 [4040]. Dynamics of the Military Organization II. 2.** Introduces military law; planning and management of personal affairs; Army transportation, logistics and personnel management systems. Studies officer/NCO relations. Includes student writing and briefing presentations on assigned topics. *Prerequisite:* ARMY 4010 or consent of department head.

**4025. Principles of Training Management. 1.** Introduces students to the Army's system of training management. Covers principles and philosophy of training, training guidance, training cycles, soldiers/leader tasks,

techniques for collective and multi-echelon training, as well as procedures for short-term planning. *Prerequisite:* consent of instructor.

**4026. Preparation of Training. 1.** Introduces the Army's system of training preparation. Covers short-range training plans, training meetings, development of timelines, publishing of training schedules, training and evaluation outlines, as well as rehearsals. *Prerequisite:* consent of instructor.

**4050. Management Internship: Cadet Troop Leadership Training. 2.** Conducted at an active Army installation. Students (under supervision) assume duties of and function as a junior commissioned officer for three-week period. Written evaluation of student's performance is returned. Offered for S/U grade only. *Prerequisites:* ARMY 3010, 3020 and consent of department head.

**4975. Military Science Independent Study. 1 (Max. 2).** A continuation of ARMY 4010 and 4020. Projects and events are set at the discretion of the professor and subject to change. *Prerequisites:* ARMY 4010 and 4020.

## Air Force ROTC

Department of Aerospace Studies

110 Wyoming Hall, 766-2338

FAX: (307) 766-2357

Web site: [www.uwyo.edu/airrotc](http://www.uwyo.edu/airrotc)

### Professors:

**TAY W. JOHANNES**, Lt. Colonel, U.S. Air Force; B.S. Montana State University 1990; M.S. AF Institute of Technology 1999; Ph.D. The George Washington University 2010; Professor of Aerospace Studies 2014.

### Assistant Professors:

**RICHARD L. BARNARD**, Captain, U.S. Air Force; B.S. Florida State University 2009; Assistant Professor of Aerospace Studies 2013.

**JOHN M. MCKEE**, Captain, U.S. Air Force; B.S. United States Air Force Academy 2008; Assistant Professor of Aerospace Studies 2014.

Air Force Reserve Officers' Training Corps (AFROTC) provides University of Wyoming students a path toward earning a commission as an officer in the United States Air Force. The curriculum provides college students a solid understanding of the leadership and military fundamentals an Air Force officer requires. AFROTC cadets supplement their normal university coursework with studies in Air Force fundamentals, history, leadership, and national security affairs. In addition, cadets have the opportunity to learn

about various careers in the Air Force through their studies, guest lectures, base visits, and other military training opportunities. While enrolled in AFROTC, the Air Force provides uniforms, AFROTC textbooks, and the necessary Air Force equipment. Upon successful completion of the program and earning their bachelor's degree, cadets are commissioned as 2<sup>nd</sup> lieutenants in the U.S. Air Force.

Application and enrollment in the program is voluntary. Students should simply register for the appropriate Air Force (AIR) courses. In addition, prospective cadets will need to complete an application package upon arrival at the detachment in order to ensure minimum qualifications for military service. Contact the AFROTC Department for additional details or with any questions regarding registration. All university students, both male and female, are eligible to apply for admission in the program.

### Four-Year Program

The four-year program is divided into two phases. The first two years comprise the General Military Course (GMC) consisting of one class period (1 hour) per week in the classroom and one class period (2 hours) per week in leadership laboratory. The GMC is a prerequisite for continuation in the Professional Officer Course (POC), the last two years in the program. Other prerequisites include passing the Air Force Officer Qualifying Test (AFOQT), maintaining at least a minimum grade point average of 2.0 (GMC) and 2.5 (POC), having the physical qualifications for an Air Force commission, and participating in a four-week field training session. The advanced course consists of one class period (3 hours) per week in the classroom and one class period (2 hours) per week in leadership laboratory.

### Three-Year Program

Students may enroll in ROTC on a three or three and one-half year program where the GMC component is shorter. To complete the GMC requirements, the student must simultaneously enroll in AIR 1000 and AIR 2000 courses to complete all four academic terms of the GMC program. After successfully completing the GMC program and Field Training, students may enter the two-year POC program. This program is especially suitable for sophomores and junior college transfers. Students that participated in high school Junior ROTC, or have prior-enlisted service, can apply documented participation toward a portion of the GMC requirement.

### Leadership Laboratory

The concept of leadership laboratory is to provide leadership training experiences which will improve a cadet's ability to perform as a USAF officer. Leadership laboratory is largely cadet planned and directed.

### Field Training

Field training is a four-week program conducted in residence at an Air Force base during the summer.

While at field training, each cadet is provided subsistence, uniforms/equipment, and receives approximately \$28.00/day plus reimbursement for travel to and from the field training base.

### Financial Benefits

Freshmen and Sophomores on AFROTC scholarships receive \$250 and \$300, per month, respectively. Juniors enrolled in the Professional Officers Course receive \$400 per month and seniors \$450 per month tax-free during the school year for subsistence. Uniforms, required texts and all necessary Air Force equipment are furnished by the government. In addition, all POC and scholarship cadets are allowed to travel anywhere in the continental United States on military aircraft (on a space available basis).

### Special Scholarship Program

Two-, three- and four-year scholarships are offered by AFROTC on a competitive basis. These scholarships pay for a \$900 book allowance per year, tuition (amount dependent on type of scholarship awarded), fees and other required expenses except room and board. The university and the State of Wyoming offer additional room and board funding to Air Force ROTC cadets (who have or have not been awarded an Air Force ROTC scholarship) and reside in university housing. High School seniors seeking a four-year scholarship should contact their high school counselors or the Recruiting Flight Commander, AFROTC Detachment 940, Dept. 3005, 1000 E. University Avenue, Laramie, WY 82071; telephone (307)766-3710; email at [airforce.rotc@uwyo.edu](mailto:airforce.rotc@uwyo.edu), early in the fall of their senior year. Sophomore or transfer students interested in competing for a scholarship should contact the Recruiting Flight Commander before the fall semester prior to junior standing.

## Military Obligation

Students enrolling in the first two years of the AFROTC Program (the General Military Course) are not obligated to military service of any kind, unless on an Air Force scholarship their sophomore year. Cadets accepting an AFROTC scholarship and those entering the Professional Officer Course become members of the inactive reserve of the United States Air Force. Upon being commissioned a Second Lieutenant in the Air Force, graduates in non-flying career fields agree to serve four years on active duty; pilot candidates agree to serve on active duty for 10 years after completion of flight training; RPA, navigator, and air battle manager candidates agree to serve on active duty for six years after completion of their respective training.

## Extracurricular Activities

To familiarize students with Air Force life and social customs, the AFROTC Program offers on a voluntary basis a wide range of extracurricular activities. Civil Air Patrol gives cadets an opportunity to experience flying first hand with a trained instructor pilot. The Arnold Air Society, a national professional honorary society, is a service organization active on campus. The color guard supports various university and local activities. Visits to Air Force bases across the nation provide insight into the function of Air Force operational units. Throughout the year, AFROTC teams participate in the university intramural sports program, while cadet-sponsored social events build the spirit of comradeship inherent in military life.

## Aerospace Studies Minor

Air Force ROTC offers an Aerospace Studies minor. For the Aerospace Studies minor, the student must complete the core AFROTC program plus: 1) 3 credit hours in any Management (MGT) course in the current UW catalog and 3 credit hours in one Political Science (POLS) course listed below, or 2) 6 credit hours of Political Science courses listed below.

POLS 1200, 2200, 2290, 2300, 2310, 3220, 3270, 3300, 4220, 4230, 4255, 4300, 4340, 4360, 4870

The 24 credit hours required to accomplish the Aerospace Studies minor will effectively compliment many majors, provide a sound basis for future professional development, and increase the career opportunities of a UW graduate.

## Air Force (AIR)

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀Q]).**

**1000. Leadership Laboratory. 0.** The concept of leadership laboratory is to provide leadership training experiences which will improve a cadet's ability to perform as a USAF officer. Leadership laboratory is largely cadet planned and directed. All cadets must enroll in leadership laboratory. *Prerequisites:* none.

**1010. Foundations of the U.S. Air Force I. 1-1/2.** First semester of a one-year series. Introduces the U.S. Air Force and Air Force Reserve Officer Training Corps. Topics include: mission and organization of the Air Force, officership and professionalism, military customs and courtesies, Air Force officer opportunities, group leadership problems and an introduction to communication skills. Leadership laboratory is mandatory for AFROTC cadets.

**1020. Foundations of the U.S. Air Force II. 1-1/2.** Continues AIR 1010 and features such topics as Air Force core values, leadership, military communication skills, interpersonal communications, team building, diversity and harassment, and the Oath of Office. *Prerequisite:* AIR 1010 or consent of instructor.

**2010. The Evolution of Air and Space Power I. 1-1/2.** First semester of one-year series. Facilitates transition from AFROTC candidate to AFROTC cadet. Topics include early flight to WWI, interwar years and the development of air doctrine, the European Theater in WWII, the Pacific Theater in WWII, independent Air Force and the Cold War, the Berlin airlift, Korea, and nuclear deterrence. Leadership laboratory is mandatory for AFROTC cadets.

**2020. The Evolution of Air and Space Power II. 1-1/2.** Second semester of one-year series. Continues AIR 2010 and features topics such as Vietnam, rebuilding for an air and space force, the Persian Gulf War, post-Cold War USAF operations, the former republic of Yugoslavia, and the Global War on terrorism. *Prerequisite:* AIR 2010 or consent of instructor.

**3010 [4010]. Air Force Leadership I. 3.** First semester of one-year series. Studies leadership and quality management fundamentals, professional knowledge, leadership, ethics and communication skills required of an Air Force officer. Uses case studies to examine Air Force leadership and management situations as a means of demonstrating and exercising practical application of the concepts being studied. Mandatory leadership laboratory complements this course by providing advanced leadership experiences in officer-type activities, giving students the opportunity to apply leadership and management principles.

**3020 [4020]. Air Force Leadership II. 3. [CS◀(none)]** Second semester of one-year series. Continues AIR 3010. *Prerequisite:* AIR 3010.

**4010 [4050]. National Security Affairs and Preparation for Active Duty I. 3. [G◀(none)]** First semester of one-year series. Examines the national security process, regional studies, leadership ethics and AF doctrine. Topics include the military as a profession, officership, military justice, civilian control of the military, preparation for active duty, national security policy development, war and warfare, and current issues affecting military professionalism. Continued emphasis is given to communication skills. Leadership laboratory is required for all AFROTC cadets.

**4020 [4060]. National Security Affairs and Preparation for Active Duty II. 3.** Second semester of one-year series. Continues AIR 4010. *Prerequisite:* AIR 4010.

# Bachelor of Applied Science

160 Agriculture Building

Awarded by the College of Agriculture and Natural Resources

Phone: (307)766-4034 Fax: (307)766-4030; Web site: [www.uwyo.edu/basa/](http://www.uwyo.edu/basa/)

Organizations need leaders at all levels who can effectively understand the environment and society in which they operate; analyze situations and solve problems; supervise and manage, interact and communicate appropriately within and outside the organization; anticipate changes; and plan for the future. The Bachelor of Applied Science degree (B.A.S.) is designed for individuals with a minimum of two years' work experience who have completed an Associate of Applied Science, Associate of Science, or an Associate of Arts degree at a Wyoming Community College (or an equivalent degree at another accredited institution) and who need or desire the additional breadth in skills, knowledge and professional expertise to enhance their capabilities in their own careers and in the organizations in which they work.

The fundamental philosophy of the B.A.S. degree is that the student must complete the general education (University Studies Program - USP) requirements expected of all UW bachelor's degrees and must engage in upper-division coursework sufficient to provide focus and depth of learning. Following this philosophy, the B.A.S. has four basic components. These components are university studies, career specialty, professional concentration, and electives. The fundamental elements of the baccalaureate degree are provided by the general education core (USP) and the upper division professional concentration. At the end of the program, students are expected to meet the following Student Learning Outcomes:

- 1) to develop proficiency in accessing, evaluating and utilizing information and ideas;
- 2) to gain an appreciation for civic engagement as a mechanism for individual, organizational and community problem solving;
- 3) to gain an appreciation for civic engagement as a mechanism for individual, organization and community problem solving;
- 4) to demonstrate the ability to acquire, evaluate and utilize information and data;
- 5) to demonstrate an understanding of organizational design, behavior, ethical practices, and effective managerial and supervisory practices;

6) to gain and understanding of social, cultural, economic and environmental contexts essential for effective leadership and the management of change.

The University Studies Program (USP 2015) consists of a minimum of 27 credit hours as adopted by the UW faculty, and the Articulation Agreement between UW and the Wyoming Community Colleges. Students with an Associate of Applied Science degree from a Wyoming community college will normally matriculate with 15-20 hours of credit that count toward this component. The remainder may be required as part of a UW student's coursework, including the Professional Concentration or Electives coursework.

The Career Specialty Component is fulfilled with the Associate of Applied Science, the Associate of Science, or Associate of Arts degrees. This component will consist of a minimum of 40 credit hours in the major.

The Professional Concentration Component is the advanced component of the program and the courses are selected by the student and the advisor. All students are required to take a range of courses from the prescribed set of areas of concentration within this component in order to provide them with the breadth and depth of learning necessary for a baccalaureate degree. This component will consist of 36-40 upper division or articulated equivalent credit hours. Note: Within the Professional Concentration, students have a choice between two Organizational Leadership areas. Option A focuses on Community Leadership; Option B focuses on Business Leadership.

The Elective Component will consist of the number of credit hours needed (after completing the other three components) to complete the degree components. A minimum of 120 hours is required for the B.A.S.

All University of Wyoming Students must earn a total of 48 upper division hours (at least 30 hours taken from UW), to earn their degree. Students in the B.A.S. program must earn a "C" in all courses on the B.A.S. checklist. Failure to do so will require repeating the course. Per university regulations, students may only attempt a course three times; an "F" or "W" count as attempts.

## Application Process

All students must apply to the Bachelor of Applied Science program, including those who would like to change their major to the B.A.S. in Organizational Leadership. Students cannot just fill out a change of major form and have Admissions change their status.

These are the steps for application:

1. Apply to the University of Wyoming through Admissions, declaring the Bachelor of Applied Science in Organizational Leadership.
2. Have official transcripts from all institutions attended sent to Admissions.
3. Email Kerry Casper at [BAS@uwyo.edu](mailto:BAS@uwyo.edu) when you have received your acceptance to UW. We can then track your files to evaluate them for the BAS program.
4. Send your resume to [BAS@uwyo.edu](mailto:BAS@uwyo.edu) via email attachment.
5. Students will receive a letter telling the application decision. If a student is denied admission to the BAS, an explanation for the denial will be provided. If accepted, the student will be given information for how to work with the program advisor, Rosalind Grenfell ([rgrenfel@uwyo.edu](mailto:rgrenfel@uwyo.edu)), to enroll in classes.

## Application Deadlines

- Students desiring to enter for Fall semester must have a completed application including transcripts received and loaded, acceptance to UW, and resume submitted by July 15th.
- Students desiring to enter for Summer must have all materials submitted by March 15th.
- Students desiring to enter for Spring must have all materials submitted by November 1st.

## Organizational Leadership Major

This program is available by distance delivery only. Entry into the program requires an application process. Students must apply for admission to UW first. Official transcripts from all institutions attended must be submitted to UW Admissions. Entry into this program requires an existing associate's degree plus a resume showing at least two years of

work experience. Once a student has applied and their transcripts have been received, Kerry Casper (kcasper2@uwyo.edu) should be notified and resume sent directly to them. Transcripts will not be analyzed prior to application.

All students pursuing a bachelor's of applied science degree in Organizational Leadership are required to complete: a) University Studies Program (USP) requirements and b) courses within the program checklist. While students may move through the program at a pace that works for them, the checklist will illustrate a path for those who wish to complete the degree in two years. Students must complete coursework from Option A or Option B as part of their degree requirements.

The University Studies Program (USP) ensures that each student's program includes the elements essential to a lifetime of personal and professional growth: habits of mind, practices of active citizenship, and development of intellectual skills. The USP program requires students to develop skills that include the ability to express oneself in speech and writing; to locate, evaluate and effectively use information; and to examine problems from quantitative, qualitative, and scientific perspectives. The USP requirements will be approximately 30 credit hours of your overall degree program.

All courses within the Bachelor of Applied Science must be completed with a grade of C or better. If you do not pass the course with a grade of C or better after three attempts you will be dismissed from your organizational leadership major.

The requirements for your program are listed in this check sheet. It is important to understand course sequencing (when courses are offered) and prerequisites (other courses that must be taken first). Each student has an assigned advisor, Rosalind Grenfell (rgrenfel@uwyo.edu). You will be advised each semester. It is important that you work closely with your advisor to plan your course schedule.

University Requirement – All degrees at the University of Wyoming require 48 upper-division credit hours (3000+).

Residency Requirement – All degrees must include a minimum of 30 credit hours from UW.

**I. Major Requirements**

<b>JUNIOR YEAR: Fall</b>		<b>Hrs.</b>
AGRI 3000 .....	3	
FCSC 3110 or ENR 4500 .....	3	
Upper division elective .....	3	
*one course from Option A or Option B .....	3	
<b>Total</b>		<b>12</b>

<b>JUNIOR YEAR: Spring</b>		<b>Hrs.</b>
*one course from Option A or Option B .....	3	
Contemporary Society course .....	3	
Upper division elective .....	3	
COJO 3010 or COJO 3190 .....	3	
<b>Total</b>		<b>12</b>

<b>JUNIOR YEAR: Summer</b>		<b>Hrs.</b>
AGRI 4990 .....	3	
<b>Total</b>		<b>3</b>

<b>SENIOR YEAR: Fall</b>		<b>Hrs.</b>
*one course from Option A or Option B .....	3	
ENGL 4010 .....	3	
Approved Career Elective.....	3	
<b>Total</b>		<b>9</b>

<b>SENIOR YEAR: Spring</b>		<b>Hrs.</b>
*one course from Option A or Option B .....	3	
AGRI 4960 or 6 credits of approved career electives .....	6	
Contemporary Society course .....	3	
<b>Total Hrs.</b>		<b>48</b>

**II. University Studies Program**

<b>Core Components</b>		<b>Hrs.</b>
Critical and Creative Thinking (FYS) .....	3	
Communication I (COM1).....	3	
Quantitative Reasoning (Q) .....	3	
Science (PN) .....	6	
Human Culture (H) .....	6	
U.S. and Wyoming Constitutions (V).....	3	

<b>Embeddable Components</b>		<b>Hrs.</b>
Communication 2 and 3 (COM2 and COM3) .....	6	
<b>Total Hrs.</b>		<b>30</b>

Earth System Science (ESS) is an interdisciplinary, environmental science, undergraduate major focusing on the interactions between the various components composing the Earth system: the biosphere, geosphere, lithosphere, hydrosphere, atmosphere, and anthrosphere. Students earning a BS degree in ESS are required to declare a concentration in one of the participating programs, which include Anthropology, Biology, Geography, Geology and Geophysics, Secondary Education, and Soil Science.

ESS is designed to be rigorous enough to prepare students for graduate studies in their chosen concentration. The Core courses also provide informal and formal opportunities for students to communicate with those in other concentrations. Students are asked to approach both the ESS office and program faculty in their respective concentration for advising.

## ESS Major

The ESS curriculum includes four areas. First, the ESS Core consists of five courses (14 credit hours), including academic credit for a required internship. Second, it requires Foundation courses (35 credit hours) in math, physics, chemistry, geographic information systems, remote sensing, and biogeochemistry. Third, courses are required by the concentration (up to 50 hours). And fourth, many USP requirements are met by Core, Foundation, and concentration courses, but others are required. The Secondary Education degree, "Earth Sciences Education" (ESSE), requires the ESS Core and many of the Foundation and USP courses, in addition to those from Education and most of the ESS concentrations.

The required Core courses start with ESS/GEOL 2000, introducing the physical Earth system. This is followed by ESS/GEOL 3480, which brings human activities into the network. Next, the Earth system is studied in more detail, with modeling used for understanding, predictions, and experiments, in a biogeochemistry. Academic credit for ESS 4970 is earned with the required internship, which is overseen and approved by a faculty committee, and usually occurs between the junior and senior years. And, finally, a senior-level capstone course, ESS 4950, emphasizes formal literature surveys and hands-on research addressing interdisciplinary questions about the Earth system.

The required courses are set for each concentration, and may be obtained from the ESS office.

The Foundation courses are listed below, divided by topic area and with choices for some classes.

LIFE	1000.....	4
MICR	2021 or .....	4
LIFE	2022 or .....	4
LIFE	2023.....	4
CHEM	1020 or 1050 .....	4
CHEM	1030 or 1060 .....	4
MATH	2200 .....	4
MATH	2205.....	4
PHYS	1210 or 1310.....	4

## Geographic Information Systems or Remote Sensing

*(Choose one of the following):*

GEOG	4200.....	4
ANTH	4160 .....	3
BOT/GEOL/GEOL	4111 .....	3
BOT/GEOL	3150 .....	3
ATSC	4033.....	3
GEOL	4113 .....	4

## Biogeochemistry

*(Choose one of the following):*

BOT	4780.....	4
CHEM	3020.....	3
GEOL	3500.....	4
GEOL	4777.....	3

## Earth System Science (ESS)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

**1000. Wyoming in the Earth System. 2. [I,L◀▶(none)]** Introduces prospective science majors to the interdisciplinary study of Earth's atmosphere, biosphere, hydrosphere and lithosphere. Focus on regional topics, such as the influence of energy development on water resources. Students learn about the methods Earth system scientists use to generate knowledge, access and use data. In addition to library skills, spatial information including remote sensing and geographic information systems is introduced.

**2000. Geochemical Cycles and the Earth System. 4. [SE◀▶(none)]** Introduces the Earth system, including the solid Earth, hydrosphere, biosphere and atmosphere. Emphasizes the evolution of the Earth, rock associations and geochemical cycles. Cross listed with GEOL 2000. *Prerequisites:* a 1000-level GEOL course with a lab and concurrent enrollment in CHEM 1020. (Normally offered fall semester)

**3480. Environmental Change. 3. [G,WB◀▶(none)]** Examines changes in the bio-physical environments and landscapes of Earth during its habitation by humans. Emphasizes integrated approaches to understanding environmental changes based on climatological, ecological, geological, archeological, and historical evidence. Explores how humans have modified Earth's environments and how societies have responded to natural and anthropogenic environmental change. Cross listed with GEOG 3480. *Prerequisites:* GEOG 1010 or any USP S, SB, SE or SP course; any WA course. (P)

**4001. Modeling the Earth System. 4.** Takes a modeling approach to demonstrate how the Earth is integrated into an interconnected system through exchanges of energy and matter, and how Earth system functioning is susceptible to human alteration. Unifying concepts focus on quantitative interactions between the Earth and the Sun, and between the Earth's lithosphere, hydrosphere, biosphere and atmosphere. Cross listed with ATSC/BOT/GEOL 4001. *Prerequisites:* MATH 2205 or equivalent and [ESS 2000 or GEOL 2000].

**4950. Exploring the Earth System. 3. [WC◀▶(none)]** Conduct interdisciplinary research on a problem addressing physical, biological, and human components of the Earth System. With several written reports, students will critically review existing literature, define a research question, collect and analyze data, and present their results in a recognized journal format. *Prerequisites:* ESS 2000 and either ESS 3480 or GEOG 3450.

**4970. Internship in Earth System Science. 2.** Academic credit for internship required of all ESS majors. The work is usually off-campus with government or industry, but may involve research with UW faculty member. Requires a written proposal and written report, both reviewed and approved by the ESS Steering Committee. *Prerequisite:* ESS 4001.



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The Helga Otto Haub School of Environment and Natural Resources advances the understanding and resolution of complex environmental and natural resource challenges by educating undergraduate and graduate students through innovative, interdisciplinary teaching. Haub School students explore contemporary natural resource issues with an interdisciplinary approach that integrates science, economics, sociology, history, ethics, and more. Students can earn a major, minor, or joint Juris Doctor/Master of Arts in environment and natural resources; or a minor in sustainability, from the Haub School.

The Haub School is also home to the William D. Ruckelshaus Institute of Environment and Natural Resources, which supports stakeholder-driven solutions to environmental challenges by communicating relevant research and promoting collaborative decision making.

Haub School students are encouraged to integrate knowledge across disciplines to become problem solvers and leaders. The school attracts outstanding undergraduate and graduate students, and prepares them to integrate multiple perspectives to address complex environmental and natural resource questions.

## Degrees Offered

The Haub School offers several campus-wide concurrent academic programs and one graduate degree in partnership with the College of Law:

**Environment and Natural Resources concurrent major** (for baccalaureate or master's students earning a degree in any of the university's seven colleges)

**Environment and Natural Resources minor** (for baccalaureate, master's, and doctoral students)

**Sustainability minor** (for baccalaureate students)

**Master of Arts in Environment and Natural Resources** (J.D./M.A. for law students only)

## Program Admission

Most prospective students will apply for admission to the University of Wyoming, and then declare a major or minor within the Haub School at any point during their course of study. To declare a major or minor, students must meet with a Haub School academic advisor.

Applicants to the J.D./M.A. in ENR must apply to both the College of Law and the Haub School. Admission to the joint degree program is contingent on acceptance to the College of Law. Current application requirements are available online.

## Undergraduate Major in ENR

The ENR major is completed in conjunction with another major in any discipline. Students must complete a total of 35 credit hours of coursework, including: 15 credit hours of ENR core courses (ENR 1200 or 1500, 2000, 3000, 4900, and 4970) and 20 credit hours of ENR disciplines courses, with at least one course from each of seven categories (Cultures & Values; Economics; Environmental Management; Physical & Natural Sciences; Policy; Scientific Uncertainty; and Electives).

The full curriculum, including the approved list of ENR disciplines courses, is available from the Haub School.

## Undergraduate Minor in ENR

Like the major, an ENR minor may augment any primary field of study. The ENR core fulfills the requirements for the minor: ENR 1200 or 1500, 2000, 3000, 4900, and 4970.

## Undergraduate Sustainability Minor

The sustainability minor is available to any undergraduate student at the University of Wyoming. The minor prioritizes systems thinking, critical thinking, civic engagement, and personal development. Students will develop and practice ethical problem-solving skills rooted in sustainability for everyday challenges.

### Curriculum

To fulfill the requirements for the undergraduate minor in sustainability, students must earn 18-19 total credits in specified categories, including:

- 9 credit hours of core courses (ENR 1300, an ethics course, and ENR 4600).
- 9-10 credit hours of elective courses, chosen from one of three tracks: General Sustainability, Food Systems, or Sustainable Energy.

## Graduate Major in ENR

The ENR major is completed in tandem with any UW degree. Students must complete 15 hours in ENR courses including 6 hours of graduate core courses (ENR 5000 and ENR 5900), and 9 hours in ENR elective courses. Students will build an individualized program of study with input from a Haub School advisor and graduate advisor from the home discipline. An addendum to the Program of Study listing approved courses must be signed by the Haub School associate director and filed prior to the student's last semester of study.

## Graduate Minor in ENR

The graduate minor is designed for doctoral students, but is available to master's students as well. In addition to the degree requirements of the student's home department, students must complete 12 credit hours to earn the ENR minor. Six of these hours are achieved in the graduate core (ENR 5000 and 5900). An additional 6 hours are chosen from a list of approved electives in consultation with the student's Haub School academic advisor and graduate advisor. Students must submit a signed addendum to the Program of Study (see above).

## Juris Doctor/Masters of Art in ENR

Students working toward the J.D./M.A. in ENR consult a Haub School advisor to design a program of study tailored to meet their educational goals. Students must earn a minimum of 30 credits for the master's degree, in five areas, including:

1. Core coursework – Second- or third-year students take ENR 5000 and 5900 for 6 credits of foundational coursework. The sequence is designed to introduce students to alternative approaches to problem solving and environmental assessment practices.
2. Elective coursework – Second-, third-, or fourth-year students must take a minimum of 9 credits outside the College of Law. Courses familiarize students with non-law ENR perspectives and approaches in environmental science, social science, and the humanities. Students work with a Haub School advisor to select courses from an approved list.

3. Environmental and natural resources law specialization – Students will take 12 credits within the law school to gain depth in ENR law. Students select from an approved menu of courses. Special approval may be granted for special topics courses.
4. Professional experience – Typically during the summer after the student’s first or second year of law school, they will secure an internship in an environmental and/or natural resources professional setting. Internships may be unpaid or paid, and are subject to approval by a Haub School advisor. Students will earn 1 credit for satisfactorily completing the internship.
5. Research – Students must also complete a cumulative work of scholarship known as the Plan B project. The Plan B offers more flexibility than a traditional thesis in content and format. Students will be required to choose a UW faculty advisor and at least two additional committee members. Committee composition is subject to approval by the director of academics. A public oral defense of the project is required. All members of the student’s committee must be present at the defense.

### Learning Outcomes for ENR Students

The primary goal of ENR studies is to add broad understanding of complex ENR issues to the depth of knowledge the student gains in a single discipline (the student’s primary major). The curriculum is designed to prepare students to demonstrate learning in six key areas:

1. Specialization & Integration – Students will complement their disciplinary depth with broad exposure to ENR-related disciplines and approaches.
2. Spatial & Temporal Perspectives - Understand the temporal and spatial characteristics of ENR challenges.
3. Policy - Recognize the content and implications of past and current ENR policies.
4. Cultures & Values - Appreciate the diversity of ENR perspectives and experiences, including the role of personal and collective value systems and structural inequalities in shaping those systems.
5. Complexity, Risk, & Uncertainty - Understand that ENR problems inherently involve complexity, risk, and uncertainty.

6. Professional & Academic Skills - Acquire specific skills necessary to succeed in a range of ENR professions and/or graduate and professional school, especially proficiency in written and oral communication, applied problem solving, and collaboration.

## Environment and Natural Resources (ENR)

**USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).**

**1000. Energy and Society. 3. [O♦♦(none)]** Introduces humans’ past, present, and future sources of energy and their advantages and limitations. Discusses society’s current, non-sustainable pattern of energy use from a supply and environmental perspective. Investigates the technical, environmental, political, and societal problems associated with the eventual conversion to renewable energy resources. Cross listed with ERS 1000.

**1100. Environment and Natural Resource Problems and Policies. 2. [I,L♦♦(none)]** Survey of environmental and natural resources issues and policies at local/regional, national, and global scales. Students are challenged to think critically as they dissect the causes, complexities, and solutions of contemporary, interdisciplinary environmental and natural resource challenges.

**1101. First-Year Seminar. 3. [(none)♦♦FYS]**  
**1200. Environment. 4. [SB♦♦PN].** Introductory environmental science course appropriate for science and nonscience majors. Uses cases studies and applied laboratories to explore core biological principles such as nutrient flow and cycling, population and community ecology, and ecosystem structure and function, as well as the non-science dimensions of ENR issues. Early-semester, weekend field trips/labs required.

**1300. Foundations of Sustainability. 3.** Examine the basic concepts, theories, and practice of sustainability as a foundation for future learning in the field. Explore principles of sustainability in our community and personal lives through various lenses and systems.  
**1400. Biodiversity: Science and Society. 3. [I, L♦♦(none)]** Biodiversity lays the foundation for nature’s ability to properly function. In turn humans depend on a healthy-functioning natural system. Adequate biodiversity provides us with many things including new genetic material for agriculture, medical discoveries, recreational opportunities and good mental health. This course will examine key themes

in our understanding of biodiversity. Students enrolled in this course will have a better understanding of issues, challenges and potential solutions to our current biodiversity crisis. Course meetings will largely consist of group discussions of assigned readings. Discussions will focus on critically evaluating and analyzing information, hypotheses and knowledge that arise from the readings. Writing assignments will emphasize succinct but thorough interpretation of information, policy, conservation and societal impacts of biodiversity.

**1500. Water, Dirt, and Earth’s Environment. 4. [SE♦♦PN].** Introductory environmental geology course focusing on water and soil both as hazards and as life-sustaining resources. Explores surface processes and climate change over geological and human timescales. Case studies illustrate the environmental tradeoffs of resource use. Cross listed with GEOL 1500.

**2000. Environment and Society. 3. [G♦♦COM2]** Develops understanding of the nature and dimensions of environmental and natural resource issues. Explores ways in which elements of society approach, evaluate, and develop positions relative to environmental issues. Uses case studies to illustrate the contemporary and historical role of individuals and societies in identifying and addressing environmental issues at scales ranging from local to global.

**2100 [BOT 2100]. Forest Management. 3.** Principles of forest management. Topics include the laws affecting forest management, methods of harvesting wood from forests, fire and insect management, the effects of disturbances on stream flow and nutrient cycling, and the challenges of developing management plans for forests. Cross listed with RNEW 2100. *Prerequisites:* LIFE 1001 or 1010.

**2330. Environmental Ethics. 3. [CH♦♦(none)]** Introduces students to ethical theory in environmental problem cases, and to philosophical issues in environmental philosophy. Ethical theories include natural law, utilitarianism, deontological and rights-based theories, relativism. Topics may include: conservation/preservation, resource management, pollution, overpopulation, factory farming, Leopold’s land ethic, deep ecology, holism, eco-feminism. Cross listed with PHIL 2330.

**2345. Natural Resource Ethics. 3. [CH,D♦♦(none)]** Introduces students to ethics in context of natural resource extraction, use, conservation, preservation, and distribution. Ethical frameworks include teleological and deontological theories primarily applied to human needs and wants. Concepts and applications of environmental justice are addressed,

including private property, sustainability, and obligations to future generations. Cross listed with PHIL/RNEW 2345.

**2450. Principles of Fish and Wildlife Management. 3.** Emphasizes principles of habitat and population biology and management, human dimensions of wildlife management, as well as law and policy. Cross listed with ZOO 2450. *Prerequisites:* LIFE 1010 and 2022. (Offered spring semester)

**2800. Introduction to Outdoor Leadership. 2.** Designed to increase knowledge and competencies related to leading others in the outdoors. Significant focus is on self-awareness, judgment, and decision-making. The specific skills and theories students learn throughout provide a foundation for other leadership endeavors. *Prerequisite:* consent of instructor.

**3000 [4000]. Approaches to ENR Problem Solving. 3. [CS,WB◀H]** Provides an introduction to environmental and natural resources problem solving and decision making. Students learn how scholars and practitioners define and structure ENR problems for management and policy decision making. Additionally, students learn approaches, processes and techniques that address problems analytically and in a values-oriented context. *Prerequisite:* ENR 2000.

**3050. Cultures of Nature in the United States. 3.** Uses artistic, philosophical, historical and literary material to investigate how ideas about and representations of nature have changed over time in the U.S. Culminates in an examination of a wide range of contemporary environmental ideas within this broad historical and cultural context. Cross listed with AMST/WMST 3050. *Prerequisite:* 2000-level course in one of the following departments: AMST, American history, American literature, or a 2000-level course approved for the ENR program.

**3100. Principles of Wildland Water Quality. 3.** Basic principles of aquatic chemistry and water quality as they relate to watershed management practices including livestock production, agronomic production, mineral and natural gas extraction and other land uses. Cross listed with REWM 3100. *Prerequisite:* CHEM 1000. (Normally offered fall semester)

**3130. Environmental Quality. 3.** Introduction to environmental quality issues and events. Course emphasizes impacts to soil, water, atmospheric, and vegetative ecosystems due to different nutrients and contaminants, including nitrogen, phosphorus, sulfur, trace elements, and organic chemicals. Current information pertaining to environmental quality is discussed and a field trip to the Union

Pacific Tie Plant. Cross listed with SOIL 3130. *Prerequisite:* complete at least 1 University Studies Science course SB, SP or SE. (Offered fall semester)

**3300. Environmental Policy, Conservation and Development in India. 3.** This course will focus on India's environmental policies pertaining to conservation and development. Case studies will be used to understand how these policies were developed, put in place, and their intended and actual outcomes. Students are required to select a suitable topic and conduct research and submit a research report. *Prerequisites:* junior standing, WA/COM1 course.

**3450 [G&R 3450]. Weather and Climate. 3.** Systematically examines elements and controls of weather and climate with application to regions. Cross listed with GEOG 3450. *Prerequisite:* GEOG 1000, 1010 or 1020. (Normally offered fall semester)

**3620. Environmental Justice. 3.** Examines core philosophical understandings of justice and applies them to the environment through a variety of case studies, analytical essays and monographs. Cross listed with POLS 3620. *Prerequisite:* POLS 1000.

**3700. Wyoming Conservation Corps Practicum. 1-2.** Required for students entering the WCC. Students will be required to make weekly journal entries and write a paper on a topic germane to their WCC experience. Additionally, necessary training for the Wyoming Conservation Corps program will be included in the course content. *Prerequisites:* Acceptance into the Wyoming Conservation Corps program.

**3750 [4750]. Natural Resource Planning and Economics. 3.** Economic concepts and rudimentary analytical tools are applied to federal, state and local natural resource planning and management programs. The value of economic input into natural resource policy is examined. Evaluating tradeoffs and resolving conflicts play a particularly important role in the course content. Cross listed with AGECE 3750. *Prerequisites:* QA, WA and junior standing. (Offered spring semester of odd-numbered years)

**3900. Seminar in Environment and Natural Resources. 1-3 (Max. 3).** Examines research and policy perspectives by a variety of authorities on selected environment and natural resource problems and issues. *Prerequisite:* ENR 3000.

**3950. Environmental Sociology. 3.** Explores how ecology, technology, politics, economics, and culture intersect. By analyzing key contemporary environmental debates, students will develop an understanding of sociological analyses, and the impact of social life on our

environment, as well as the effect of the environment on social life. Topics covered include: the environmental movement; sustainable development; developing nations and their environment; capitalism and technology; and environmental justice. Cross listed with SOC 3950. *Prerequisite:* SOC 1000.

**4010. Winter Ecology: Skills of the Winter Naturalist. 1.** Emphasizes field naturalist skills, the effects of winter abiotic conditions on organisms and subsequent adaptations to these conditions, animal tracking, introduction to snow dynamics and winter safety. *Prerequisite:* 6 hours of ENR or science courses.

**4011. Winter Ecology: Snowpack Science and Dynamics. 1.** Emphasizes snow science and avalanche safety through lectures and inquiry-based field laboratories. *Prerequisite:* 6 hours of ENR or science courses.

**4012. Winter Ecology: Wildlife and Plant Adaptations. 1.** Emphasizes animal and plant adaptations to cope with the stresses of winter, as well as the predicted impacts of climate change, through lectures and inquiry-based field laboratories. Students also conduct field research in a winter environment. *Prerequisite:* 6 hours of ENR or science courses.

**4030. Ecology of Knowledge. 3.** Examines the development of "disciplines" and explores definitions, theories, methods and practices of interdisciplinary work. Cross listed with AMST 4030. Dual listed with ENR 5030. *Prerequisite:* 3 hours in any interdisciplinary program.

**4040 [G&R 4040]. Conservation of Natural Resources. 3. [CS◀(none)]** Geographically analyzes conservation of natural and human resources, as well as political, social and ethical ramifications of our environmental policy. Cross listed with BOT/GEOG 4040. *Prerequisite:* 6 hours of geography or ENR.

**4051. Environmental Politics. 3. [WC◀(none)]** Analyzes environmentalism as a political phenomenon. Provides students with a basic understanding of how to analyze political issues by: (1) examining the historical and contemporary issues that produce controversy over environmental matters; and (2) surveying the impacts of these issues on the formulation and implementation of laws, policies, and regulations. Cross listed with AMST, POLS, GEOG and REWM 4051. *Prerequisite:* POLS 1000.

**4052. Federal Land Politics. 3.** Examines the political forces that have shaped and continue to shape federal land policy and management. Explores the interactions between democratic decision making and science in the management of federal lands. Surveys the sources of controversy over federal land management and

methods for harmonizing public demands with technical expertise. Cross listed with POLS/AMST/GEOG/REWM 4052. *Prerequisite:* POLS 1000.

**4285. Wildland Hydrology. 3.** Teaches essential and unique characteristics of hydrologic cycle as occurs on range and forest lands, concentrating on quantification of these processes and storages. Cross listed with REWM 4285. Dual listed with ENR 5285. *Prerequisite:* graduate standing and University Studies QA.

**4310. Environmental Anthropology. 3.** Addresses how human societies interact with their surroundings, emphasizing cultural understandings of the environment. Introduces variety of theoretical and methodological approaches to topics ranging from problems of the American West to global environmental change. Cross listed with ANTH 4310. Dual listed with ENR 5310. *Prerequisite:* ANTH 1200. (Normally offered every third semester)

**4420. Conservation Biology. 3.** Addresses the broadest environmental issues facing society (habitat loss, invasion, overexploitation) and the mechanisms driving them, with particular attention to the Intermountain West. Through computer exercises, students also learn how to evaluate conservation efforts and make management recommendations. Cross listed with BOT/ZOO 4420. *Prerequisites:* LIFE 3400 and one of the following: ENR 3500, STAT 2050, or STAT 2070.

**4450. Negotiation. 3.** Examines how to use negotiation to resolve conflict and get agreement. Describes conflict; outlines ways to address conflict; examines different negotiation strategies and the impact of cognitive bias, power, ethics, and individual and cultural differences; and explores mediation practices. Students complete negotiations, role-plays, and questionnaires. Cross listed with AGECE 4450. Dual listed with ENR 5450. *Prerequisite:* completion of USP O requirement; junior standing.

**4500. Risk Analysis 3. [QB◀(none)]** Introduces basic concepts of risk analysis, including risk perception, identification, assessment, communication, management, and policy. Provides quantitative treatment of risk assessment procedures, fundamental mathematical models, and the concepts of variability and uncertainty; and practical experience in risk analyses conducted by teams of students. Emphasizes environment and natural resource examples. Dual listed with ENR 5500. *Prerequisites:* MATH1000 or 1400, introductory statistics and familiarity with Excel spreadsheets.

**4501. Risk Analysis Computer Laboratory. 1.** Laboratory section in which students use computer software to apply Monte Carlo analysis and Decision Analysis to environmental case studies. Laboratory section facilitates application of principles of risk analysis in decision-making presented in lecture in ENR 4500. Dual listed with ENR 5501. *Prerequisite:* Concurrent enrollment in ENR 4500/5500.

**4525. Environmental Data Analysis. 4.** Explores fundamentals of environmental data analysis including the display and description of data, uncertainty propagation, statistical significance and power, t-tests, ANOVA, time series, serial correlation, multiple regression, and sample collection strategies. Students must enroll in a computer-based lab session and complete a term project involving real-world problems in data analysis. Dual listed with ENR 5525. Cross listed with GEOL 4525/5525. *Prerequisites:* A grade of C or better in STAT 2050 or STAT 2070 or MATH 2200, junior standing or higher, and completion of at least one upper-division course in the natural sciences or a related field.

**4600. Campus Sustainability. 3.** Uses campus as a setting to explore long-term environmental, economic, and social sustainability theory and practice. Students design and implement a semester-long project to improve sustainability of the UW campus. This interdisciplinary course is appropriate for students of all disciplines. Dual listed with ENR 5600; cross listed with MKT 4600. *Prerequisites:* junior or senior standing.

**4550 [4700]. Negotiation Analysis. 3.** Focuses on using an analytical perspective for maximizing joint gains between negotiators. Students learn analytical techniques to prepare for negotiation, evaluate options and proposals during a negotiation, and evaluate negotiated outcomes with respect to maximization of joint gains and fairness criteria. Dual listed with ENR 5550; Cross listed with AGECE 4550. *Prerequisite:* QA.

**4750. ENR Law and Policy. 3.** Explores the policy underpinnings of environmental and natural resource issues and the legal responses to these problems. Students will gain a basic understanding of: (1) the causes of environmental problems, including energy, water, wildlife, and other western land use issues; (2) the range of policy and instrument choices; and (3) the approaches actually taken in current laws. Students also will apply the law in an interdisciplinary, problem-based learning context. Dual listed with ENR 5750. *Prerequisites:* ENR 2000 and upper division standing or permission of instructor.

**4800. Historic Preservation. 3.** Review of the roots of historic preservation in Western culture with an emphasis on the historical and legal context of architectural conservation in America. Current issues in preservation are examined through case studies and guest presentations. Cross listed with AMST 4800. Dual listed with ENR 5800. *Prerequisite:* ARE 3020 or AMST 5400.

**4890 [4990]. Topics in Environment and Natural Resources. 1-6.0 (Max. 12).** Special topics in environment and natural resources are offered under this number. The specific subject matter varies each year because the course is normally taught by faculty who wish to present a specialized topic of interest to ENR and other students. Check class schedule for specific topics offered each year. Dual listed with ENR 5890. *Prerequisites:* ENR 3000 or permission of the instructor.

**4900. ENR Policy in Practice. 3. [WC◀(none)]** Encompasses student resolution in multidisciplinary teams of environmental and natural resource problems and issues; practice in formulating policy alternatives; case studies; planning, performing and coordinating multidisciplinary research. Dual listed with ENR 5900. *Prerequisite:* ENR 3000.

**4950. Leadership in Natural Resources Management. 2.** Provides Crew Leaders in the Wyoming Conservation Corps with an understanding of the complex dynamics of natural resources management while also equipping students with the tools to confidently lead groups of students on conservation-oriented service-learning projects on Wyoming's public lands during the summer months. Dual listed with ENR 5950; cross listed with ERS 4950. *Prerequisites:* ENR 3700 and consent of instructor.

**4970. ENR Internship. 1-6.0 (Max. 6).** Provides practical experience in environmental and natural resource policy, management and decision processes, as well as interaction with professionals in the field. Offered S/U only *Prerequisites:* ENR 3000.

**5000. Approaches to Environment and Natural Resources Problem-Solving. 3.** Explores important environmental policy, collaborative and adaptive decision-making and the integration of diverse disciplines in the study and resolution of complex ENR challenges. This is the first course in the ENR Capstone series (along with ENR 4900) and the students should take both capstone courses in the same academic year. Dual listed with ENR 4000. *Prerequisite:* USP WA course.

**5030. Ecology of Knowledge. 3.** Examines the development of “disciplines” and explores definitions, theories, methods and practices of interdisciplinary work. Cross listed with AMST 5030. Dual listed with ENR 4030. *Prerequisite:* graduate status.

**5050. Techniques in Environmental Data Management. 4.** Centers on the role of information technology in support of scientific research. Through integration of multiple software packages (e.g. Relational databases, ProgramR and ArcGIS), proven database designs, and SQL scripting, increased efficiency and utility will occur during data analyses. These information science principles are demonstrated using project-based examples. Cross listed with ECOL./GEOG 5050. *Prerequisite:* graduate standing.

**5150. Environmental Science: Perspectives and Methods. 3.** This course will use complex, real-world environmental challenges to explore fundamental scientific principles. Students will learn how scientists tackle environmental issues by formulating objectives, collecting and analyzing scientific data, as well as to critically evaluate information sources and limitations to scientific approaches due to constraints associated with each study. *Prerequisite:* graduate standing.

**5285. Wildland Hydrology. 3.** Teaches essential and unique characteristics of hydrologic cycle as occurs on range and forest lands, concentrating on quantification of these processes and storages. Cross listed with REWM 5285. Dual listed with ENR 4285. *Prerequisite:* graduate standing and University Studies QA.

**5310. Environmental Anthropology. 3.** Addresses how human societies interact with their surroundings, emphasizing cultural understandings of the environment. Introduces variety of theoretical and methodological approaches to topics ranging from problems of the American West to global environmental change. Cross listed with ANTH 5310. Dual listed with ENR 4310. *Prerequisite:* ANTH 1200.

**5450. Negotiation. 3.** Examines how to use negotiation to resolve conflict and get agreement. Describes conflict; outlines ways to address conflict; examines different negotiation strategies and the impact of cognitive bias, power, ethics, and individual and cultural differences; and explores mediation practices. Students complete negotiations, role-plays, and questionnaires. Cross listed with AGECE 5450. Dual listed with ENR 4450. *Prerequisite:* completion of USP O requirement; junior standing.

**5500. Risk Analysis. 3.** Introduces basic concepts of risk analysis, including risk perception, identification, assessment, communication, management, and policy. Provides quantitative treatment of risk assessment procedures, fundamental mathematical models, and the concepts of variability and uncertainty; and practical experience in risk analyses conducted by teams of students. Emphasizes environment and natural resource examples. *Prerequisites:* MATH 1000 or 1400, introductory statistics and familiarity with Excel spreadsheets.

**5501. Risk Analysis Computer Laboratory. 1.** Laboratory section in which students use computer software to apply Monte Carlo analysis and Decision Analysis to environmental case studies. Laboratory section facilitates application of principles of risk analysis in decision-making presented in lecture in ENR 5500. Dual listed with ENR 4501. *Prerequisite:* Concurrent enrollment in ENR 4500/5500.

**5525. Environmental Data Analysis. 4.** Explores fundamentals of environmental data analysis including the display and description of data, uncertainty propagation, statistical significance and power, t-tests, ANOVA, time series, serial correlation, multiple regression, and sample collection strategies. Students must enroll in a computer-based lab session and complete a term project involving real-world problems in data analysis. Dual listed with ENR 5525. Cross listed with GEOL 4525/5525.

**5600. Campus Sustainability. 3.** Uses campus as a setting to explore long-term environmental, economic, and social sustainability theory and practice. Students design and implement a semester-long project to improve sustainability of the UW campus. This is an interdisciplinary course and is appropriate for students of all disciplines. Dual listed with ENR 4600; cross listed with MKT 5600. *Prerequisite:* USP WB course.

**5550 [5700]. Negotiation Analysis. 3.** Focuses on using an analytical perspective for maximizing joint gains between negotiators. Students learn analytical techniques to prepare for negotiation, evaluate options and proposals during a negotiation, and evaluate negotiated outcomes with respect to maximization of joint gains and fairness criteria. Dual listed with ENR 4550; Cross listed with AGECE 5550. *Prerequisite:* QA.

**5750. ENR Law and Policy. 3.** Explores the policy underpinnings of environmental and natural resource issues and the legal responses to these problems. Students will gain a basic understanding of: (1) the causes of environmental problems, including energy, water,

wildlife, and other western land use issues; (2) the range of policy and instrument choices; and (3) the approaches actually taken in current laws. Students also will apply the law in an interdisciplinary, problem-based learning context. Dual listed with ENR 4750. *Prerequisites:* ENR 2000 and upper division standing or permission of instructor.

**5800. Historic Preservation. 3.** Review of the roots of historic preservation in Western culture with an emphasis on the historical and legal context of architectural conservation in America. Current issues in preservation are examined through case studies and guest presentations. Cross listed with AMST 5800. Dual listed with ENR 4800. *Prerequisite:* ARE 3020 or AMST 5400.

**5890. Topics in Environment and Natural Resources. 1-6 (Max. 12).** Special topics in environment and natural resources are offered under this number. The specific subject matter varies each year because the course is normally taught by faculty who wish to present a specialized topic of interest to ENR and other students. Check class schedule for specific topics offered each year. Dual listed with ENR 4890. *Prerequisite:* ENR 5000 or consent of instructor.

**5900. ENR Policy in Practice. 3.** Encompasses student resolution in multidisciplinary teams of environmental and natural resource problems and issues; practice in formulating policy alternatives; case studies; planning, performing and coordinating multidisciplinary research. Dual listed with ENR 4900. *Prerequisites:* graduate standing and ENR 5000.

**5920. Collaboration Program in Natural Resources: Principles and Methods. 3.** The first of two classes that together merit a Professional Certificate of Completion of the Collaboration Program in Natural Resources, this class provides graduate students with the leadership skills necessary to design, convene, and sustain a natural resource collaborative process with diverse stakeholders and implement its outcomes. *Prerequisite:* Admission by consent of instructor.

**5921. Collaborations Program in Natural Resources: Practicum. 1 (Max. 3).** The second of two classes that together merit a Professional Certificate of Completion of the Collaboration Program in Natural Resources, this class provides the practicum component where graduate students or professionals practice their collaborative leadership skills by conducting a situation assessment, designing and/or convening a natural resource collaborative process. *Prerequisite:* Admission by consent of instructor.

**5950. Leadership in Natural Resources Management. 2.** Provides Crew Leaders in the Wyoming Conservation Corps with an understanding of the complex dynamics of natural resources management while also equipping students with the tools to confidently lead groups of students on conservation-oriented service-learning projects on Wyoming's public lands during the summer months. Dual listed with ENR 4950; cross listed with ERS 5950. *Prerequisites:* ENR 3700 and consent of instructor.

# Information Literacy

Coe Library 304

Phone: (307)766-2070

The University Libraries offer research assistance and information literacy instruction to students and faculty. Librarians provide customized class orientations to information sources in various disciplines, as well as individual research consultations. Students needing research help may call, email, instant message, or visit William Robertson Coe Library, or the Brinkerhoff Earth Resources Information Center.

The University of Wyoming addresses information competencies utilizing the framework of the Information Literacy Standards for Higher Education as approved by the Association of College & Research Libraries (ACRL) and endorsed by the American Association for Higher Education. Librarians collaborate with teaching faculty in addressing these information competencies in course assignments or lectures. Information literacy is the ability to recognize and define the need for information, then locate, evaluate, and use that information effectively and ethically.

University of Wyoming librarians have developed TIP: Tutorial for Info Power (<http://tip.uwyo.edu>) as a general introduction to information competencies. Students are required to work through the tutorial and pass the TIP quiz as part of the University Studies information literacy component. The TIP tutorial has been adapted for use at other institutions and has been recognized by the ACRL for inclusion in their Peer-Reviewed Instructional Materials Online database.

The Libraries also offer credit courses to help students improve research skills and to meet the information literacy requirement of the University Studies Program. Current offerings are restricted to upper-division students.

## Learning Outcomes

We expect that students completing LBRY courses will become knowledgeable consumers of information through learning how to:

1. Recognize and define the need for information;
2. Efficiently locate information in the library or on the Internet;
3. Evaluate the quality of information;
4. Utilize information effectively, ethically, and legally.

## Associate Librarians

**KAIJSA J. CALKINS**, B.A. University of Washington-Bothell 2001, M.L.I.S. University of Washington-Seattle 2004; Associate Librarian 2012, 2006.

**JENNY GARCIA**, B.A. Regis University 1989; M.L.S. Emporia State University 1992; Associate Librarian 2009, 2003.

**CHERYL GOLDENSTEIN**, B.A. Bethany College 1982; M.L.S. University of Texas at Austin 1997; Associate Librarian 2009, 2002.

**DAVID D. KRUGER**, B.S. South Dakota State University 1991; B.S.Ed. Minot State University 1994; M.A. Kansas State University 1996; M.L.S. University of Missouri at Columbia 1998; Associate Librarian 2004, 1998.

**JENNIFER MAYER**, B.A. University of Wyoming 1991; M.L.I.S. University of Oklahoma 1996; Associate Librarian 2005, 1999.

**LAWRENCE SCHMIDT**, B.S. Montana State University 1987; M.S. 1995; M.L.S. Emporia State University 2002; Associate Librarian 2008, 2002.

## Assistant Librarians

**KATE CONERTON**, B.A. University of Wisconsin-Eau Claire 2011; M.L.I.S. University of British Columbia 2013; Assistant Librarian 2013.

**JUDITH E. PASEK**, B.S. University of Michigan Ann Arbor 1977; M.S. University of Missouri 1980; Ph.D. University of Nebraska 1987; M.L.I.S. Wayne State University 2013; Assistant Librarian 2013.

## Information Literacy (LBRY)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [L◀(none)]).

**3010. [L◀(none)] Research from a Distance. 1.** Students locate, evaluate, and synthesize free and fee-based information resources used in academic and work environments, with a special focus on accessing information remotely. Course assignments are customized to student's academic major and career goals. Students discuss ethical and legal issues surrounding information use. *Prerequisites:* ENGL 1010 or equivalent, junior standing.

**3020. Managing and Navigating the World of Information. 3. [L◀(none)]** Prepares students to be knowledgeable consumers of information in our global, high-tech society. Skills taught will enable students to locate and manage information resources, preparing them for university level research and life after graduation. *Prerequisite:* USP WA course.

# Intercollegiate Athletics

Fieldhouse North

Thomas K. Burman, Director

Phone: (307)766-2292 FAX: (307)766-5414

Web site: [wyomingathletics.com](http://wyomingathletics.com)

**BRYAN BERRYHILL**, B.S. Colorado State University 2001; Head Track and Field/Cross Country Coach 2012.

**CRAIG P. BOHL**, B.S. University of Nebraska-Lincoln 1982; Head Football Coach 2014.

**THOMAS K. BURMAN**, B.S. University of Wyoming 1988; M.B.A. Robert Morris University 1991; Director of Intercollegiate Athletics 2006.

**MARK P. BRANCH**, B.S. Oklahoma State University 1997; Masters in Athletic Administration 1999; Head Wrestling Coach 2008.

**CHAD CALLIHAN**, B.S. Radford University 2001; Head Women's Volleyball Coach 2013.

**EDGAR DEAN CLOWER**, B.A. Lamar University 2005; Head Women's Tennis Coach 2012.

**TIM COLLINS**, B.A. Loyola Marymount University 2005; M.S. Chadron State University 2008; Assistant Athletic Director for Development 2013.

**PETER CUADRADO**, B.A. Texas Christian University 2000; M.L.A. Valparaiso University 2002; Head Women's Soccer Coach 2012.

**TYSON DREW**, B.A. University of Idaho 2004; M.S. 2007; Assistant Athletic Director for Facilities and Event Management 2013.

**ZACHARY P. DUVAL**, B.S. University of Nebraska-Lincoln 2000; Director of Sports Performance/Head Football Strength Coach 2014.

**TIMOTHY J. HARKINS**, B.S. University of Kansas 1984; M.S. University of Tulsa 1992; Associate Athletic Director Media/Public Relations 2007, 1991.

**FLOYD JOSEPH JENSEN**, B.S. University of Wyoming 1998; Head Men's Golf Coach 2002.

**THOMAS JOHNSON**, B.A. University of Wyoming 1986; Head Swimming Coach 1998.

**JOSEPH J. LEGERSKI, JR.**, B.S. University of Wyoming 1979; Head Women's Basketball Coach 2003.

**KEVIN MCKINNEY**, B.S. University of Wyoming 1971; Senior Associate Athletic Director for External Operations 1972.

**JULIE D. MANNING**, B.S. Iowa State University 1983; Senior Associate Athletic Director for Sports Administration/SWA 2014.

**MATTHEW ORTEGA**, B.S. New Mexico State University 2000; Spirit Program Coordinator/Head Coach 2014.

**RYAN PINSON**, A.A. University of Alaska 1996; B.S. Oregon State University 2000; M.E. Northern Arizona University 2004; Director of Sports Medicine 2013.

**BRAD POE**, B.S. University of Idaho 2003; General Manager Wyoming Sport Properties 2013.

**NICHOLAS POPPLEWELL**, B.S. University of Idaho 2008; M.E. University of Washington 2009; Assistant Athletic Director for Marketing and Branding 2012.

**PETER PRIGGE**, B.A. Marquette University 2009; J.D. 2012; Director of Compliance 2012.

**ALBERT REISER**, B.A. Lawrence University 2001; M.S. Indiana University 2006; M.S. 2008; Assistant Athletic Director/Academic Services 2014.

**LARRY SHYATT**, B.A. College of Wooster 1973; M.E. University of Akron 1975; Head Men's Basketball Coach 2011.

**BILL SPARKS**, B.S. Marshall University 1979; M.S. University of Georgia 1993; Sr. Associate Athletic Director for Business Operations 1998.

**JOSEY STENDER**, B.S. University of Memphis 2001; M.S. 2004; Head Women's Golf Coach 2005.

**JOE VERSCHUEREN**, B.A. Hope College 2004; M.S. Valparaiso University 2006; Assistant Athletic Director for Ticketing and Sales 2014.

**RANDY WELNIAK**, B.S. University of Wyoming 1988; M.B.A. 1989; Senior Associate Athletic Director for Development and Revenue Enhancement 2011.

**MATTHEW J. WHISENANT**, B.S. East Tennessee State University 1996; M.A. 1999; Deputy Director of Athletics 2002.

**PHILLIP WILLE**, B.A. Valparaiso University 2002; J.D. 2005; Associate Athletic Director for Internal Operations 2012.

## Mission Statement

The University of Wyoming Department of Intercollegiate Athletics is committed to the development of tomorrow's leaders by creating an environment that promotes personal growth, academic and athletic excellence in a progressive, inclusive, and transparent manner. The Department of Intercollegiate Athletics will support the overall University of Wyoming mission, provide an outstanding fan experience, encourage community engagement, and serve as a source of pride for alumni, supporters, and the state of Wyoming.

## Guiding Principles

- **Dedication to Student-Athletes:** We will promote the well-being of student-athletes and provide opportunities for academic, athletic, and personal success. We will foster academic excellence, graduate student-athletes, support their development as citizens, and prepare them to be leaders.
- **Integrity:** We will demonstrate integrity in all areas. We are dedicated to financial stability, rules compliance, diversity, and personal accountability.
- **Respect:** We will celebrate a climate of mutual respect, inclusiveness, loyalty, and sportsmanship by recognizing contributions to our teams, our department, and the university.
- **Competitive Success:** We will endeavor to be the very best when representing the University of Wyoming and our state. We are committed to providing the resources and personnel for our teams to achieve success.
- **Tradition:** The legacy of the University of Wyoming athletics is proud and strong. We will honor our outstanding tradition.
- **Excellence:** We believe in a spirit of comprehensive excellence. We will strive for excellence in all we do.



**General Information**

The University of Wyoming Department of Intercollegiate Athletics (DIA) consists of 17 teams competing at the NCAA Division I level: men's and women's basketball, men's and women's cross country, football (FBS), men's and women's golf, women's soccer, men's and women's swimming, women's tennis, women's volleyball, men's and women's indoor track, men's and women's outdoor track and wrestling. All sports are fully-funded up to the NCAA maximum for grant-in-aids (i.e., scholarships).

The University of Wyoming competes in the Mountain West Conference (MWC). In addition to the University of Wyoming the MWC consists of the U.S. Air Force Academy, Boise State University, Colorado State University, University of Nevada-Las Vegas, University of New Mexico, San Diego State University, and Texas Christian University.

The DIA is managed by the Director of Intercollegiate Athletics who reports directly to the President of the University. The Director of Intercollegiate Athletics ensures the department operates in a manner consistent with the rules and regulations of the University, the MWC and the NCAA.

\*For additional information please visit the University's official athletic website at: [www.gowyogo.com](http://www.gowyogo.com)

# National Outdoor Leadership School

Administered jointly by the Office of Academic Affairs and the Center for Advising and Career Services

222 Knight Hall

Jo Chytka, Director

Center for Advising and Career Services

Phone: (307)766-2398 FAX: (307)766-2089; Web site: [www.uwyo.edu/cacs](http://www.uwyo.edu/cacs)

The University of Wyoming (UW) and National Outdoor Leadership School (NOLS) Articulation Agreement provides the opportunity for degree seeking UW students to receive UW academic credit for NOLS courses.

When NOLS students step into the world's wild places, they bring not only their backpacks, but also more than 40 years of experience in expeditioning. NOLS founder Paul Petzoldt's idea was simple: take people into the wilderness for an extended period of time, teach them the right things, feed them well and when they walk out of the mountains, they will be skilled leaders. The core of his idea was the extended expedition, one of sufficient length that a person could learn and practice the skills over and over again. That is the backbone of every NOLS course and today the school is widely recognized as the world's leader in the extended expedition, from two weeks to twelve.

This articulation agreement covers domestic and international NOLS originated semester-long courses. This agreement will also cover some individual short-term courses (14-45 days; including mountaineering, rock climbing, sailing, kayaking, skiing, snowboarding, and backpacking) and the Wilderness First Responder course ("WFR")

## Application: Students Enrolled at UW

Students who have completed at least one semester at UW, and are in good standing for academics and conduct prior to the proposed period of study, may apply to receive articulated NOLS credit.

All students interested in obtaining internship course credits must be advised by the appropriate UW unit prior to taking the NOLS semester course.

Students enrolled in the NOLS program may apply their financial aid to the cost of the program if they are enrolled as a full-time degree seeking student at the University of Wyoming.

## Credit and Credit Transfer

UW credit hours will be awarded in the approved courses, which require prior UW academic department and college approval, upon completion of the NOLS courses, provided a grade equivalent to a UW grade of C or better was obtained at NOLS.

Students should be aware that for internship credits to be awarded, additional academic work requirements determined by the internship course home will need to be met. Those additional requirements vary between academic programs and amount of credit desired, but may include a satisfactory evaluation from NOLS, a weekly journal, a substantial written report, and an oral presentation.

UW credit will not be awarded if the student withdraws or is expelled from the NOLS course.

## Academic Advising

Prior to participating in a NOLS course for UW credit, students must contact the Director of the Center for Advising and Career Services, his/her designee, and the student's assigned adviser. These persons will approve the student's schedule, provide the appropriate course numbers, and liaise with the NOLS Registrar.

Students enrolling in NOLS semester long courses must register for a minimum of 12 UW credit hours for the participating semester.

UW students studying at NOLS will be bound by all rules, regulations and by-laws in operation at NOLS. In addition, since UW students remain enrolled as degree candidates at UW, they must also adhere to UW standards of conduct, rules and regulations. UW and NOLS both abide by the Federal Right to Privacy Act (FERPA).

## Financial Arrangements

Each UW student will pay to NOLS:

- The NOLS tuition and related fees (any changes to be advised in writing by NOLS at least three months in advance of the change coming into effect), related fees would include equipment deposit;
- Complete medical and evacuation health insurance;
- Other fees (e.g. tuition protection program, local transportation, and gear purchases), air transportation and additional living expenses will be paid directly by the student to the provider of the service.

Each UW student will pay to the UW Outreach School

- The published per credit registration fees to register UW credits earned at NOLS

## Approved NOLS Semester Courses

Semester in the Rockies  
Teton Valley Semester  
Outdoor Educator Semester  
Semester in the Southwest  
Semester in the Sonoran  
Semester in Patagonia  
Semester in Baja  
Summer Semester in Australia  
Semester on the Borders  
Semester in the Yukon  
Semester in Alaska  
Semester in Australia  
Semester in New Zealand  
Semester in the Pacific Northwest  
Semester in the Amazon  
Semester in India  
Year in Patagonia  
Year in Sonoran

**NOLS Courses**

Absoraka Backpacking  
 Wind River Mountaineering  
 Rock Climbing  
 Rock and River  
 Whitewater River Expeditions  
 Salmon Backpacking and Rafting  
 Snowboarding  
 Skiing  
 Pacific NW Backpacking  
 Himalaya Backpacking  
 Himalaya Mountaineering  
 Australia Backpacking  
 and Sea Kayaking  
 Australia Backpacking  
 Patagonia Mountaineering  
 Baja Sea Kayaking  
 Yukon Outdoor Ed-  
 Backpacking and River

Yukon Backpacking and River  
 Alaska Mountaineering  
 Denali Mountaineering  
 Alaska Outdoor Ed-Backpacking  
 and Sea Kayaking  
 Brooks Range Backpacking and River  
 Southwest Alaska Sea Kayaking  
 23 and over Prince William  
 Sound Alaska Sea Kayaking  
 Amazon Basin River Expedition  
 Mountain, River, Sea Kayaking,  
 Sailing Instructor Courses  
 Professional Instructor  
 Baja Coastal Sailing  
 Pacific Northwest Trip Leader  
 North Cascades Mountaineering  
 Waddington Range Mountaineering  
 Pacific Northwest Outdoor  
 Education Mountaineering

Pacific Northwest Sea  
 Kayaking and Sailing  
 Patagonia Mountaineering  
 Patagonia Backpacking and Fly Fishing  
 NOLS/Orvis Wilderness Fly Fishing  
 Wilderness Horsepacking  
 Rocky Mountain Outdoor Educator  
 Scandinavian Backpacking  
 Scandinavian Sea Kayaking  
 and Backpacking  
 Southwest Outdoor Educator  
 Backpacking and Rock Climbing  
 Southwest Lightweight Backpacking  
 Winter Outdoor Educator  
 New Zealand Backpacking  
 Yukon Backpacking  
 Yukon Backpacking and  
 Wilderness Canoeing  
 Alaska Backpacking and Packrafting  
 Rocky Mountain Lightweight  
 Backpacking

The School of Energy Resources facilitates interdisciplinary academic and research programs in engineering and science, economics, and environment and natural resources policy to address critical energy-related issues faced by our society.

Our mission is to leverage and add to the already significant energy-related talent and resources in the University of Wyoming colleges to develop human resources, know-how, and technical solutions to ensure a secure and sustainable energy future for the state, region, and nation.

### Professors:

**TIMOTHY J. CONSIDINE**, B.A. Loyola University 1975; M.S. Purdue University 1977; Ph.D. Cornell University 1981; SER Professor of Energy Economics 2008.

**CRAIG C. DOUGLAS**, A.B. Chicago University 1977; M.S. Yale University 1978; M.Phil. 1980; Ph.D. 1982; SER Professor of Mathematics 2008.

**SUBHASHIS MALLICK**, B.Sc. Indian Institute of Technology 1976; M.Sc. 1978; Ph.D. University of Hawaii 1987; SER Professor of Geology & Geophysics 2008.

**BRUCE A. PARKINSON**, B.S. Iowa State University 1972; Ph.D. California Institute of Technology 1977; SER Professor of Chemistry 2008.

### Associate Professors:

**PO CHEN**, B.S. Beijing University 2000; Ph.D. University of Southern California 2005; SER Associate Professor of Geology and Geophysics 2014, 2008.

**MAOHONG FAN**, B.S. Wuhan University of Science and Engineering, 1984; M.S. Beijing University of Science and Technology, 1992; Ph.D. Chinese Academy of Sciences, 1997; Ph.D. Iowa State University, 2000; Ph.D. Osaka University 2003; SER Associate Professor of Chemical Engineering 2008.

**JOHN P. KASZUBA**, B.S. Beloit College, 1982; M.S. Virginia Polytechnic Institute & State University 1986; Ph.D. Colorado School of Mines, 1997; SER Associate Professor Geology & Geophysics 2008.

**MOHAMMAD PIRI**, B.Sc. Azad University, Arak 1995; M.Sc. Azad University, Tehran 1998; M.Sc. Imperial College, London 2000; Ph.D. 2004; SER Associate Professor of Petroleum Engineering 2011, 2006.

### Assistant Professors:

**KRISTINA HUFFORD**, B.A. University of California, Berkeley, 1993; Ph.D. University of Georgia, 2001; SER Assistant Professor of Rangeland Ecology and Watershed Management 2010.

**DARIO GRANA**, B.S. University of Pavia, 2003; M.S. 2005; M.S. University of Milano Bicocca, 2006; Ph.D. Stanford University, 2013; SER Assistant Professor of Geology and Geophysics 2013.

**TARA RIGHETTI**, B.A. University of Colorado Boulder 2005; J.D. 2007; SER Assistant Professor of Law 2014.

### Adjunct Faculty

Vladimir Alvarado, Carrick Eggleston, K.J. Reddy, Victor Ginting, Robert Godby, Lamia Goual, Ye Zhang

### Energy Resource Management and Development Bachelor of Science

One of the most important challenges of the 21st century will be to develop and manage energy resources in a sustainable manner. Projections show energy consumption worldwide will increase nearly 50 percent by 2035. And half of the leadership in the energy industries is expected to retire in the next five to ten years.

The future of energy will be characterized by increasing knowledge, relentless change, and technological innovation. As global energy industry increases in complexity, demand will dramatically grow for professionals with a multidisciplinary, entrepreneurial skill set. Future leaders must understand complex engineering and scientific technology within the context of business, legal, social and public policy in order to create comprehensive and sustainable solutions.

The Energy Resource Management and Development (ERM&D) B.S. program is designed to fill this need through a combination of rigorous courses, real-world internships, and undergraduate research experiences. It is a collaborative degree with the Colleges of Arts and Sciences, Agriculture and Natural Resources, Business, Engineering and Applied Sciences, and Law as well as the Haub School of Environment and Natural Resources. The curriculum balances depth of learning with breadth of understanding to train graduates for sustained competitive success in the energy workforce at the frontiers of knowledge and

for self-directed, life-long learning. Students learn to focus on continuous improvement, constant assessment and the importance of a sense of urgency and consideration of profit motive in the energy industry

Our program emphasizes career planning and provides constant one-on-one guidance and assistance to ensure optimal workforce placement. Students are strongly encouraged to complete an industry internship (minimum GPA requirement is typically 3.0). Opportunities are also available for undergraduate research, a study abroad experience or a summer field trip. Multiple events during the year connect students to energy industry professionals.

### Required Academic Performance

The student must earn a letter grade of C or better in each course and a cumulative GPA of 2.0 or better.

### Concentrations

The Energy Resource Management and Development program offers four concentrations and students must declare at least one concentration. They are professional land management; fossil fuels; energy air, land and water management; and renewable energy. The suggested course sequences are shown below.

### Fossil Fuels Concentration Suggested Course Sequence

Freshman Year: Fall	Hours
First-Year Seminar (FYS).....	3
U.S. & Wyoming Constitutions (V).....	3
ENGL 1010 (COM1).....	3
MATH 2200 (Q).....	4
GEOL 1100 (PN).....	4
<b>Total Hours</b>	<b>17</b>

Freshman Year: Spring	Hours
PHYS 1210 (PN).....	4
ERS 1300.....	3
ACCT 1010.....	3
ENGL 2005 (COM2).....	3
MATH 2205 (Q).....	4
<b>Total Hours</b>	<b>17</b>

Sophomore Year: Fall	Hours
PHIL 2345 (H).....	3
CHEM 1020 (PN).....	4
MATH 2210.....	4
ECON 1020 (H).....	3
ES 1060.....	3
<b>Total Hours</b>	<b>17</b>

<b>Sophomore Year: Spring</b>		<b>Hours</b>
CHEM 1030 (PN).....	4	
ES 2310.....	3	
ES 2330.....	3	
PETE 2050.....	3	
MATH 2310.....	3	
<b>Total Hours</b>	<b>16</b>	

<b>Junior Year: Fall</b>		<b>Hours</b>
STAT 2050 (Q).....	4	
PETE 3255.....	3	
PETE 3265.....	2	
SOIL 3130.....	3	
ECON elective.....	3	
<b>Total Hours</b>	<b>14</b>	

<b>Junior Year: Spring</b>		<b>Hours</b>
PETE 3200.....	3	
GEOL 4190 or 4835.....	3	
PETE 3100.....	2	
FIN 3250.....	3	
MGT 3210.....	3	
<b>Total Hours</b>	<b>14</b>	

<b>Senior Year: Fall</b>		<b>Hours</b>
Upper division general elective.....	3	
REWM 4200.....	3	
AGEC/ENR 4450 or AGEC/ENR 4550.....	3	
ENR 4500.....	3	
ENR 4501.....	1	
ENR 4750.....	3	
<b>Total Hours</b>	<b>16</b>	

<b>Senior Year: Spring</b>		<b>Hours</b>
ERS 4900 (COM3).....	3	
DSCI 4260.....	3	
Practicum elective.....	3	
General elective.....	7	
<b>Total Hours</b>	<b>16</b>	
<b>Total Credit Hours</b>	<b>128</b>	

\*Please see the School of Energy Resources for an approved list of general electives, economics electives, and practicum electives.

**Renewable Energy Concentration  
Suggested Course Sequence**

<b>Freshman Year: Fall</b>		<b>Hours</b>
First-Year Seminar (FYS).....	3	
U.S. & Wyoming Constitutions (V).....	3	
ENGL 1010 (COM1).....	3	
MATH 2200 (Q).....	4	
ES 1060.....	3	
<b>Total Hours</b>	<b>16</b>	

<b>Freshman Year: Spring</b>		<b>Hours</b>
ERS 1300.....	3	
ACCT 1010.....	3	
ENGL 2005 (COM2).....	3	
MATH 2205 (Q).....	4	
ES 2110.....	3	
<b>Total Hours</b>	<b>16</b>	

<b>Sophomore Year: Fall</b>		<b>Hours</b>
MATH 2210.....	4	
PHYS 1210 (PN).....	4	
ECON 1020 (H).....	3	
CHEM 1020 (PN).....	4	
<b>Total Hours</b>	<b>16</b>	

<b>Sophomore Year: Spring</b>		<b>Hours</b>
STAT 2050 (Q).....	4	
ES 2310.....	3	
ES 2330.....	3	
MATH 2310.....	3	
CHEM 1030 (PN).....	4	
<b>Total Hours</b>	<b>17</b>	

<b>Junior Year: Fall</b>		<b>Hours</b>
ES 2210.....	3	
PHIL 2345 (H).....	3	
SOIL 3130.....	3	
FIN 3250.....	3	
ES 2410.....	3	
<b>Total Hours</b>	<b>15</b>	

<b>Junior Year: Spring</b>		<b>Hours</b>
ERS/CHEM 4050.....	3	
MGT 3210.....	3	
ME 3360.....	3	
ECON elective.....	3	
General elective.....	3	
Technical elective.....	3	
<b>Total Hours</b>	<b>18</b>	

<b>Senior Year: Fall</b>		<b>Hours</b>
General elective.....	3	
REWM 4200.....	3	
AGEC/ENR 4450 or AGEC/ENR 4550.....	3	
ENR 4500.....	3	
ENR 4501.....	1	
ENR 4750.....	3	
<b>Total Hours</b>	<b>16</b>	

<b>Senior Year: Spring</b>		<b>Hours</b>
ERS 4900 (COM3).....	3	
DSCI 4260.....	3	
ME 4460.....	3	
ME 4470.....	3	
Practicum.....	3	
<b>Total Hours</b>	<b>15</b>	
<b>Total Credit Hours</b>	<b>128</b>	

\*Please see the School of Energy Resources for an approved list of general electives, economics electives, and technical electives.

**Energy Air, Energy Land and Water  
Management Concentration  
Suggested Course Sequence**

<b>Freshman Year: Fall</b>		<b>Hours</b>
First-Year Seminar (FYS).....	3	
U.S. & Wyoming Constitutions (V).....	3	
MATH 2200 (Q).....	4	
ENGL 1010 (COM1).....	3	
LIFE 1010 (PN).....	4	
<b>Total Hours</b>	<b>17</b>	

<b>Freshman Year: Spring</b>		<b>Hours</b>
ES 1060.....	3	
ACCT 1010.....	3	
ERS 1300.....	3	
ENGL 2005 (COM2).....	3	
ECON 1020 (H).....	3	
<b>Total Hours</b>	<b>15</b>	

<b>Sophomore Year: Fall</b>		<b>Hours</b>
LIFE 2023.....	4	
CHEM 1000 or 1020 (PN).....	4	
REWM 2000.....	3	
STAT 2050 (Q).....	4	
<b>Total Hours</b>	<b>15</b>	

<b>Sophomore Year: Spring</b>		<b>Hours</b>
SOIL 2010.....	4	
LIFE 3400.....	3	
GEOG 2150.....	4	
PHIL 2345 (H).....	3	
General elective.....	3	
<b>Total Hours</b>	<b>17</b>	

<b>Junior Year: Fall</b>		<b>Hours</b>
REWM 2500.....	2	
REWM 3100.....	3	
SOIL 3130.....	3	
AGEC 3400.....	3	
FIN 3250.....	3	
General elective.....	3	
<b>Total Hours</b>	<b>17</b>	

<b>Junior Year: Spring</b>		<b>Hours</b>
AGEC 3750.....	3	
REWM 4710.....	3	
MGT 3210.....	3	
General elective.....	3	
ERS 3010.....	3	
<b>Total Hours</b>	<b>15</b>	

<b>Senior Year: Fall</b>		<b>Hours</b>
AGEC/ENR 4550.....	3	
REWM 4200.....	3	
ENR 4500.....	3	
ENR 4501.....	1	
ENR 4750.....	3	
GEOG 4200.....	4	
<b>Total Hours</b>	<b>17</b>	

<b>Senior Year: Spring</b>		<b>Hours</b>
ERS 4900 (COM3).....	3	
AGEC/ENR 4450.....	3	
DSCI 4260.....	3	
Practicum elective.....	3	
REWM 4580.....	3	
<b>Total Hours</b>	<b>15</b>	
<b>Total Credit Hours</b>	<b>128</b>	

\*Please see the School of Energy Resources for an approved list of general electives and practicum electives.

**Professional Land (Landman) Management Concentration Suggested Course Sequence**

<b>Freshman Year: Fall</b>		<b>Hours</b>
First-Year Seminar (FYS).....	3	
U.S. & Wyoming Constitutions (V).....	3	
ENGL 1010 (COM1).....	3	
MATH 2200 or 2350 (Q).....	4	
GEOL 1100 (PN).....	4	
<b>Total Hours</b>	<b>17</b>	

<b>Freshman Year: Spring</b>		<b>Hours</b>
ECON 1020 (H).....	3	
ERS 1300.....	3	
ACCT 1010.....	3	
ENGL 2005 (COM2).....	3	
MATH 2205 or 2355 (Q).....	4	
<b>Total Hours</b>	<b>16</b>	

<b>Sophomore Year: Fall</b>		<b>Hours</b>
ACCT 1020.....	3	
IMGT 2400.....	3	
PHIL 2345 (H).....	3	
STAT 2050 (Q).....	4	
CHEM 1000 or 1020 (PN).....	4	
<b>Total Hours</b>	<b>17</b>	

<b>Sophomore Year: Spring</b>		<b>Hours</b>
MGT 1040.....	3	
MGT 3210.....	3	
MKT 3210.....	3	
FIN 3250.....	3	
GEOG 2150.....	4	
ERS 4985.....	1	
<b>Total Hours</b>	<b>17</b>	

<b>Junior Year: Fall</b>		<b>Hours</b>
DSCI 3210.....	3	
AGEC 3400.....	3	
AGEC/ENR 4550.....	3	
ENR 4750.....	3	
GEOG 4200.....	4	
<b>Total Hours</b>	<b>16</b>	

<b>Junior Year: Spring</b>		<b>Hours</b>
AGEC 3750.....	3	
GEOL 4190.....	3	
DSCI 4260.....	3	
REWM 4710.....	3	
AGEC/ENR 4450.....	3	
ERS 4985.....	1	
<b>Total Hours</b>	<b>16</b>	

<b>Senior Year: Fall</b>		<b>Hours</b>
ENR 4500.....	3	
ENR 4501.....	1	
LAW 6120.....	3	
LAW 6170.....	1	
LAW 6790.....	3	
LAW 6800.....	3	
<b>Total Hours</b>	<b>14</b>	

<b>Senior Year: Spring</b>		<b>Hours</b>
ERS 4900 (COM3).....	3	
LAW 6735.....	3	
General electives.....	9	
<b>Total Hours</b>	<b>15</b>	
<b>Total Credit Hours</b>	<b>128</b>	

\*Please see the School of Energy Resources for an approved list of general electives.

**Concurrent Major in Environment and Natural Resources**

A student majoring in Energy Resource Management and Development (ERM&D) program may earn a double major by completing the courses required for the Environment and Natural Resources (ENR) program in addition to the ERM&D requirements. Visit [www.uwyo.edu/enr](http://www.uwyo.edu/enr) for the ENR requirements.

**Minors**

Students looking to create a focus for their coursework can add minors to the ERM&D program. Courses applying towards the minor must be completed with a grade of "C" or better. Visit the college or department web sites for a description of the minors.

**College of Agriculture and Natural Resources**

- Natural Resource Economics
- Rangeland Ecology and Watershed Management
- Reclamation and Restoration Ecology
- Soil Science

**College of Arts and Sciences**

- Biology
- Chemistry
- Foreign Language
- Geography
- Geographic Information Sciences
- Planning
- Geology
- Mathematics
- Physics
- Professional Writing
- Public Relations

**College of Business**

- Accounting
- Business
- Decision Science
- Economics
- Entrepreneurship
- Finance
- International Business
- Management
- Marketing
- Sustainable Business Practices

**Haub School**

- Environment and Natural Resources
- Sustainability

**School of Energy Resources (ERS)**

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

**1000. Energy and Society. 3. [O◀▶(none)]** Introduces humans' past, present, and future sources of energy and their advantages and limitations. Discusses society's current, non-sustainable pattern of energy use from a supply and environmental perspective. Investigates the technical, environmental, political, and societal problems associated with the eventual conversion to renewable energy resources. Cross listed with ENR 1000.

**1101. First-Year Seminar. 3. [(none)◀▶FYS]**  
**1300. Oil: Business, Culture, and Power. 3. [CS,G◀▶(none)]** A multi-disciplinary approach to understanding how oil affects the international relations and commerce. The relationships between oil technology, social and political institutions, the unique cultures in oil-producing regions will be investigated in case studies. Cross listed with ECON 1300.

**2500. Communication Across Topics in Energy. 3.** Students will develop skills in written, oral, and digital communication as appropriate to all specializations within the School of Energy Resources, all allied disciplines, and coursework at all levels. Through repeated instruction, practice, and feedback, the communication sequence will emphasize and progressively develop transferable skills for students' academic work and future professions within Energy Resources. ERS will emphasize foundational oral and digital communication skills and continue to build on writing skills. *Prerequisites:* ERS 1300 or ECON 1300 and WA/COM1.

**3010. Air Quality Management. 3.** Provides an overview of air quality management approaches. In this course an interdisciplinary approach is adopted that includes diverse information from physical, natural and socioeconomic systems. With consideration of global and local issues this class focuses upon the energy sector. *Prerequisites:* CHEM 1000 or CHEM 1020 and WA or COM1.

**4050. Solar Energy Conversion. 3.** Provides an overview of the science behind current and future solar thermal and photovoltaic technologies. Environmental aspects, legal issues

and cost associated with solar energy will also be included. Cross listed with CHEM 4050. *Prerequisites:* CHEM 1030 or CHEM 1060 and PHYS 1210 or PHYS 1310 and MATH 2200. (Offered spring semester)

**4900. Energy Resource Management Capstone. 3. [WC◀(none)]** Required to work within an integrated team to research and analyze data to inform an energy resource management plan. Apply the content knowledge and process skills learned throughout the program and further refine their ability to communicate with professional, academic, and public audiences through writing and oral presentation. *Prerequisites:* AGECE 3400, ENR 3000/4000 or GEOG/ESS 3480.

**4950. Leadership in Natural Resources Management. 2.** Provides Crew Leaders in the Wyoming Conservation Corps with an understanding of the complex dynamics of natural resources management while also equipping students with the tools to confidently lead groups of students on conservation-oriented service-learning projects on Wyoming's public lands during the summer months. Dual listed with ERS 5950; cross listed with ENR 4950. *Prerequisites:* ENR 3700 and consent of instructor.

**4960. Energy Field Studies. 2.** Various facets of energy resource management and development are covered by visits to oil and gas wells, coal mines, power plants, wind farms, uranium sites and other energy production and research sites. A trip is normally planned for 8 to 10 days. *Prerequisites:* USP WA course; ERS 1000 or 1300.

**ERS 4965. Undergraduate Research. 1-3 (Max. 6).** Research activities on an energy-related project of limited scope or as part of a laboratory project of greater scope under the advisement of a faculty member. Students will work 4 to 10 hours per week. Students will submit a written report summarizing the results of the research. *Prerequisite:* WA; SP or SE.

**4970. Internship. 1-3 (Max. 3).** A formalized internship designed to provide students with relevant practical experience in the energy sector allowing synthesis and application of principles in energy science to energy asset management. *Prerequisites:* ERS/ENR 1000 or ECON/ERS 1300; QB; SP or SE.

**4975. Global Experience in Energy. 2-4 (Max. 4).** A 1-3 month integrative energy experience in China or Australia. Students will participate, in collaboration with partnering energy professionals, in outcomes focused education and research programs designed to address globally relevant challenges. Students will gain a global perspective within the cultural context of the partner institution. *Prerequisites:* ERS/ENR 1000 or ECON/ERS 1300; QB; SP or SE.

**4985. Seminar. 1-3 (Max. 3).** Energy professionals, including accredited professional landmen, practicing attorneys, and other energy professionals will present a colloquium styled course to bridge conceptual content with realistic workforce focused applications. *Prerequisites:* ERS/ENR 1000 or ECON/ERS 1300 and WA and QB.

**4990. Topics in Energy Resource Development and Management. 1-6 (Max. 6).** Special topics in contemporary energy development and management will be offered in response to changing industry and academic demands. The specific subject matter is based on faculty requirements and workforce innovation. *Prerequisites:* QA and one of the following: SB, SP or SE course.

**5950. Leadership in Natural Resources Management. 2.** Provides Crew Leaders in the Wyoming Conservation Corps with an understanding of the complex dynamics of natural resources management while also equipping students with the tools to confidently lead groups of students on conservation-oriented service-learning projects on Wyoming's public lands during the summer months. Dual listed with ERS 4950; cross listed with ENR 5950. *Prerequisites:* ENR 3700 and consent of instructor.

The University Honors Program provides academically ambitious students with a series of curricular and co-curricular opportunities. Through these opportunities, students gain the breadth of knowledge needed by citizens, professionals, and family members to be effective in many different pursuits. Honors students learn to write cogently for a variety of audiences and to become skilled in writing in their disciplines. They learn to locate and use reliable information and trustworthy opinion. Through appropriate coursework, they learn how to become engaged citizens and to understand the ethnic and cultural diversity of America and the world. They learn the purposes and values of the arts, humanities, and social sciences. The capstone senior honors project is a sustained research or creative activity through which students demonstrate what they have learned: to formulate a project independently, to develop the intellectual and creative means to complete it, and to write and speak effectively about their work.

## Admission

Most students join the program prior to their freshman year. Freshman applicants meet at least one of the following criteria: a composite ACT score of 28, or a combined verbal and quantitative SAT score of 1240, or a high school GPA of 3.7.

The program also welcomes UW and transfer students up to the beginning of the junior year. To join, these students need an overall college GPA of 3.25.

Interested high school seniors and transfer students are encouraged to come by the Honors Program Office (Red House 116) or to write to the Director, University Honors Program, Dept. 3413, 1000 University Ave, Laramie, WY 82071. The email address is [honors@uwyo.edu](mailto:honors@uwyo.edu).

## Scholarships

At least 20 entering freshmen and transfer students will receive four-year scholarships in amounts ranging from \$1,000 to \$4,000. Other scholarships are awarded annually to honors students, including scholarships for off-campus study. Applications are due between January 15th and March 13th.

## Program Requirements

Once enrolled, honors students take five innovative and intellectually challenging core courses. In the freshman year, students take the two-semester Freshman Honors Colloquium which introduces the history of western culture by studying classics from various times and their contexts. In the first semester, students can fulfill the freshman writing requirement by enrolling in HP 1020 (W1); freshmen who have already met the composition requirement take HP 1151. All freshman honors students then take HP 2020 in the spring. Thereafter, students enroll in one honors course each year: Non-Western Perspectives for sophomores; Modes of Understanding for juniors; and a Senior Honors Seminar. Each of these courses fulfills graduation requirements.

The capstone senior honors project assures that students gain research or creative experience in an area of their interest. These projects often lead to graduate studies or a special career path.

To continue in the program, students must maintain a cumulative grade point average of 3.25. Students whose GPA falls below 3.25 are placed on probation.

Successful completion of the program is indicated on transcripts and diplomas, and seniors are recognized at graduation ceremonies.

Honors courses are restricted to honors program students; exceptions must be approved by the Honors Program Office.

## Honors Program (HP)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

**1000. Intellectual Communities. 1. [I◀▶(none)]** Queries the nature, functions, and benefits of intellectual communities from the ancient world to present. *Prerequisite:* Concurrent enrollment in HP 1020, HP 1151 or HP 1161.

**1020. Freshman Honors Colloquium I. 3. [WA,L◀▶COM1]** Composition course. Provides innovative writing instruction to honors students while introducing works and history of Western culture. Particularly emphasizes analytical reading and writing. *Prerequisite:* participation in UW Honors Program. (Offered fall semester)

**1151 [1150]. Freshman Honors Colloquium I. 3. [CH,L◀▶H]** Studies significant works in the history of Western civilization to the Renaissance, both in their historical context and in relation to one another. For entering freshmen who have already fulfilled the WA requirement. *Prerequisite:* participation in the UW Honors Program. (Offered fall semester)

**1200. American and Wyoming Government. 3. [V◀▶(none)]** Introduction to the constitutions and governmental processes of Wyoming and the United States. *Prerequisite:* participation in UW Honors Program.

**2020 [1160,1161]. Colloquium II. 3. [WB,O◀▶COM2]** Continues study of significant works in Western and Eastern literary, scientific and philosophical traditions begun in Colloquium I. Assignments focus on using critical discourse, historical research, and textual analysis to produce effective written compositions and oral presentations. *Prerequisite:* WA.

**2151, 2152, 2153 [2150]. Non-Western Perspectives. 3 (Max. 6). [(none)◀▶H]** Explores issues central to human experience from perspectives of non-western peoples. Topics vary from year to year. Required of UW Honors Program students. *Prerequisites:* sophomore standing and participation in UW Honors Program.



**3151, 3152, 3153 [3150]. Modes of Understanding. 3 (Max. 6).** Introduces study of nature and grounds of knowledge, its limits and validity. Examines epistemological basis of selected areas of academic thought. Topics vary from year to year. Required of UW Honors Program students. *Prerequisites:* junior standing and participation in UW Honors Program.

**4151, 4152, 4153 [4150]. Senior Honor Seminar. 3 (Max. 6).** Asks students to confront a complex social issue, examine it from several perspectives and take a stance on some aspect of the issue. Topics vary from year to year. Required of UW Honors Program students. *Prerequisites:* senior standing and participation in UW Honors Program.

**4154. Senior Honors Seminar. 3.** Asks students to confront a complex social issue, examine it from several perspectives and take a stance on some aspect of the issue. Topics vary from year to year. Required of UW Honors Program students. *Prerequisites:* senior standing and participation in the UW Honors Program.

**4975. Independent Study. 1-3 (Max. 6).** [WC♦(none)] Supervised study and investigation in topics related to students' research.

**4976. Independent Study. 1-3 (Max. 6).** Supervised study and investigation in topics related to student's research.

**4990. Topics: \_\_\_\_ . 1-3 (Max. 6).** Accommodates a senior seminar series or a course offering by visiting faculty whose subject matter is not included in other course offerings. (Offered based on sufficient demand and resources)

UWYO courses are designed to help students acculturate to college life and coursework and learn key academic skills. Course content is combined with training in critical reading, academic writing, research, formal presentation, and many other emphases. UWYO courses have low student-teacher ratios in an effort to help students experience richer connection with the instructor and students in the course. Most UWYO courses imbed intellectual self-awareness within the course goals. Several UWYO courses are part of UW learning communities and provide additional opportunities for students to engage with and work together in their cohort.

For more information on the Synergy program and courses, contact Jessica Willford at [synergy@uwyo.edu](mailto:synergy@uwyo.edu). For more information on Student Success Services, contact Sandy Straley at (307) 766-6189; [sstrale2@uwyo.edu](mailto:sstrale2@uwyo.edu).

## UWYO (UWYO)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB4Q]).

**1000. IC for Undeclared Students. 2. [I,L(none)]** An introduction to the intellectual community of the University of Wyoming, information literacy, and higher education in general, and is specifically intended for students who have not yet made a decision about their college major. Students will begin to develop the critical thinking skills that are necessary in higher education and to explore the primary intellectual activities of various disciplines. Cross listed with A&S 1000.

**1050. Student-Athlete First Year Seminar. 1.** Introduces first-year student athletes to U.W. Includes an introduction to campus resources, time management and study skill techniques, exploration of learning styles, diversity topics, and strategic goal setting to be a successful student and athlete. S/U only.

**1101. First-Year Seminar. 3. [(none)FYS]**

**1105. Academic Success Skills. 2.** Designed to provide students the necessary skill set to succeed at the University and beyond. Skills covered include time management, learning styles, note taking, self-motivation and more.

**1205. Student Success Services First Year Seminar. 1. [I,L(none)]** First year students enrolled in the Student Success Services project will learn how to utilize campus resources and understand, her/his interests and values and develop the ability to establish and work toward short-term and long-term career goals, apply personalized study strategies and interpret university, college, and departmental rules and regulations. *Prerequisite:* Freshman only (exclusively for students who are part of the SSS project).

**1210. First Year Experience Seminar II. 1.** Provides students opportunities to explore career options that match their personality profile; create goals to optimize their college years; understand the value of service learning in their college and professional careers, and recognize how awareness of self and others leads to success in college and their professional careers. Satisfactory/unsatisfactory only. *Prerequisite:* UWYO 1205.

**1450. Critical Reflection in Intellectual Communities. 3. [I,L(none)]** Intellectual Community course for the Synergy learning community. Supports WA reading, research, and writing activities. Provides opportunities for students to read critically, conduct primary and secondary research, investigate diversity issues, develop computer literacy, and learn about the intellectual expectations of college life. Unaffiliated with a major department.

**1600. Veterans Transition Course. 1. [I,L(none)]** Provides returning veterans skills for successful transition to college life. Reviews basic tools for academic success, resources available to the returning veteran, and information on veteran related challenges. Students will write a reflective paper and also a career plan. (Normally offered fall semester)

**3000. Student Leadership in Supplemental Instruction. 2.** Focuses on theoretical perspectives of group tutoring and peer leadership, best practices in supplemental instruction, and student reflection. Will strengthen leadership knowledge and skills and introduce effective methods for group facilitation and SI curriculum. *Prerequisite:* closed to general enrollment.

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- DOLENCE, E. KURT, Pharmacy
- DOMENECH, CONXITA, Modern  
and Classical Languages
- DONAHUE, DEBRA L., Law,
- DORST, JOHN D., American Studies
- DOUGLAS, CRAIG C., SER/Mathematics
- DOUSAY, TONIA, Professional Studies
- DOWNES, WILLIAM MISSOURI,  
Theatre and Dance
- DRIESE, KENNETH, Botany
- DRUMMOND, KENT G.,  
Management and Marketing
- DUAN, DONGLIANG, Electrical  
and Computer Engineering
- DUEKER, KENNETH G.,  
Geology and Geophysics
- DUFF, MICHAEL, Law
- DUNCAN, CASEY D., Law
- DUTTA, DEBASHIS, Chemistry
- EDSON, MICHAEL, English
- EGGLESTON, CARRICK M.,  
Geology and Geophysics
- EHMKE, COLE, Agricultural and  
Applied Economics
- EHMKE, MARIAH, Agricultural  
and Applied Economics
- ELIASON, NATHAN, Nursing
- ELLSBOGEN, MARTIN JR., Family Practice
- EMBREE, JOY K., Accounting
- ENLOW, ANN, Nursing
- ENRIGHT, MICHAEL, Nursing
- ERIKSON, ROBERT, Civil and  
Architectural Engineering
- ERNEST, HOLLY, Veterinary Sciences
- ESTES, DAVID, Psychology
- ETHIER, MARLENE, Nursing
- ETTEMA, ROB, Civil and  
Architectural Engineering
- EVERS, JACK, Chemical and  
Petroleum Engineering
- EWERS, BRENT E., Botany
- EWIG, RICHARD G., American  
Heritage Center
- FADIAL, JOHN M., JR., Music
- FALL, TYLER S., Religious Studies
- FAN, MAOHONG, Chemical and  
Petroleum Engineering
- FARRELL, MARY M., University Libraries
- FAY, DAVID, Molecular Biology
- FELDMAN, STEPHEN M., Law
- FERRE-PIKAL, EVA S., Electrical  
and Computer Engineering
- FERTIG, RAY, Mechanical Engineering
- FINE, PETER, Art
- FINNOFF, DAVID C., Economics and Finance
- FISHER, RICK, English
- FITCH, ANDREW, English
- FLEMING, PATRICK, Economics and Finance
- FLESHER, PAUL V.M., Religious Studies
- FLYNN, FRANCIS W., Zoology and Physiology
- FONESCA, VANESSA, Latina/o  
Studies, English
- FORBES, ERIN, English
- FORD, STEPHEN P., Animal Science
- FORD, DAWN, Nursing
- FORRESTER, JENNIFER HARRIS,  
Elementary and Early  
Childhood Education
- FOULKE, THOMAS, Agricultural  
and Applied Economics
- FOX, JONATHAN H., Veterinary Sciences
- FOX, LANAE, Pharmacy
- FRANCIS, MATTHEW, American  
Heritage Center
- FRENCH, JEFFREY, Atmospheric Science
- FRENG, ADRIENNE B., Criminal Justice
- FRENG, SCOTT, Psychology
- FRICK, CARL, Mechanical Engineering
- FROST, B. RONALD, Geology and Geophysics
- FROST, CAROL D., Geology and Geophysics
- FURTADO, FREDERICO da  
CUNHA, Mathematics
- GABRIELSON, TEENA J., Political Science
- GAMBOA, RUBEN, Computer Science
- GALBREATH, PAMELA, English
- GALEY, FRANCIS D., Veterinary Sciences
- GANTENBEIN, REX E., Medical  
Education and Public Health
- GARCIA, JENNY, University Libraries
- GARCIA, TERESA J.,  
Communication Disorders
- GARDZELEWSKI, JON, Civil and  
Architectural Engineering
- GARNER, ANDREW, Political Science
- GARNICH, MARK R., Mechanical Engineering
- GARRISON, JEAN A., Political Science,  
Global and Area Studies
- GASEM, KHALED A.M., Chemical  
and Petroleum Engineering
- GATLIN, JESSE, Molecular Biology
- GAUDREAULT, KAREN,  
Kinesiology and Health
- GEERTS, BART, Atmospheric Science
- GERINGER, JENNIFER, Elementary  
and Early Childhood Education
- GEROW, KENNETH, Statistics
- GIGLEY, JASON, Molecular Biology
- GILBERT, BENJAMIN T.,  
Economics and Finance
- GILLIS, VICTORIA, Secondary Education
- GILLS, MARY, Nursing
- GILMAN-KEHRER, ESTHER, Nursing
- GINTING, VICTOR, Mathematics
- GLASSCOCK, ROBSON, Accounting
- GLOVER, MARK, Law

- GODBY, ROBERT W., Economics and Finance  
GOGINENI, SRIDHAR,  
Economics and Finance  
GOHEEN, JACOB R., Zoology and Physiology  
GOLDENSTEIN, CHERYL,  
University Libraries  
GOLDMAN, BENJAMIN,  
American Heritage Center  
GOMELSKY, MARK, Molecular Biology  
GOOD, JULIAN, Nursing  
GOODIN, SUSANNA L., Philosophy  
GOODSON, PATRICIA A., Chemistry  
GOODWIN, ELIZABETH, Nursing  
GOUAL, LAMIA, Chemical and  
Petroleum Engineering  
GRAHAM, ANDREA, American Studies  
GRANA, DARIO, Chemical and Petroleum  
Engineering; Geology and Geophysics  
GRANDJEAN, BURKE, Statistics  
GRAY, MATTHEW J., Psychology  
GREASER, CHRISTIAN, Modern  
and Classical Languages  
GREENE, MARK A., American  
Heritage Center  
GRIBB, WILLIAM J., Geography  
GRIESMAIER, FRANZ-PETER, Philosophy  
GRIFFITH, MICHAEL, Music  
GUIBERSON, MARK,  
Communication Disorders  
GUO, WEL, Animal Science  
GUSEMAN, EMILY, Kinesiology and Health  
GUZZO, ANNE, Music  
HAGER, MARY SUE, Nursing  
HALL, CHRISTOPHER, Mathematics  
HALL, MARILYN, Nursing  
HALL JR., ROBERT O., Zoology  
and Physiology  
HAMANN, JERRY C., Electrical  
and Computer Engineering  
HAMERLINCK, JEFFREY,  
Geography, WyGISC  
HAMILTON, DEBRA, Nursing  
HAMILTON, TIMOTHY, Army ROTC  
HAN, CHUNG-SOUK, Mechanical  
Engineering  
HAN, TAO, Elementary and Early  
Childhood Education  
HANEY, CAROLYN, Social Work  
HANSEN, KRISTIANA M., Agricultural  
and Applied Economics  
HARBOUR, CLIFF, Professional Studies  
HARDESTY, CANYON, Wyoming  
Institute for Disabilities (WIND)  
HARDIN-JONES, MARY,  
Communication Disorders  
HARDY, LEAH, Art  
HARKIN, ALISON, Gender  
and Women's Studies  
HARKIN, MICHAEL E., Anthropology  
HARROLD, PAUL, Army ROTC  
HARSHBERGER, CARA, Pharmacy  
HART, ANN MARIE, Nursing  
HARTMAN, RONALD L., Botany  
HARTUNG, CYNTHIA M., Psychology  
HARVEY, JARON, Management and Marketing  
HAYDON, MARGARET, Art  
HAYES, SHAUN, American Heritage Center  
HAYNES, CHRIS, Secondary Education  
HE, GUANGLONG, Pharmacy  
HEANEY, APRIL, English; Learn  
HEINZ, PETRA, Modern and  
Classical Languages  
HEINZ, STEFAN, Mathematics  
HEITHOLT, JIM J., Plant Sciences  
HELFGOTT, ISADORA, History  
HELLER, PAUL L., Geology and Geophysics  
HELMSING, MARK, Secondary Education  
HENDRYX, JASON, Secondary Education  
HENKEL, SCOTT, English  
HENNE, ADAM, Global and Area  
Studies, Anthropology  
HENSEL, LARRY L., Music  
HERBERT, STEPHEN K., Plant Sciences  
HERMANSEN-KOBULNICKY,  
CAROL, Pharmacy  
HERT, TAMSEN L., University Libraries  
HESS, BRET W., Animal Science  
HEWLETT, JOHN, Agricultural  
and Applied Economics  
HIDECKER, MARY JO C.,  
Communications Disorders  
HILAIRE, MICHELLE L., Pharmacy  
HILD, ANN L., Ecosystem Science  
and Management  
HILGERT, CHRIS, Plant Sciences  
HILL, ROBIN, Elbogen CTL  
HITCHCOCK, JOHN M., Computer Science  
HIX, HARVEY, Philosophy  
HOBART, SYLVIA A., Mathematics  
HOBERG, JOHN O., Chemistry  
HODGSON, LEE, Theatre and Dance  
HODZA, PADDINGTON, WyGISC  
HOLBROOK, W. STEVEN,  
Geology and Geophysics  
HOLLAND, JEANNE E., English  
HOLLES, JOSEPH, Chemical and  
Petroleum Engineering  
HOLMES, MALCOLM D., Sociology  
HOLT, PHILIP, Modern and Classical Languages  
HORNECKER, JAMIE R., Pharmacy  
HOUSEAL, ANA, Elementary and Early  
Childhood Education, Science and  
Mathematics Teaching Center  
HOWARD, GEORGE, Agriculture  
and Natural Resources  
HOWELL, ROBERT R., Geology  
and Geophysics  
HSU, SANDY, Communication and Journalism  
HUIZINGA, SHARON, Theatre and Dance  
HUFFORD, KRISTINA, Ecosystem  
Science and Management  
HUGHES, CYNTHIA D., University Libraries  
HULIN, BRYAN K., Army ROTC  
HULLEY, ELLIOTT, Chemistry  
HUMPHREY, NEIL F., Geology and Geophysics  
HUNT, ELIZABETH, Art  
HUNTER, MELISSA, Pharmacy  
HUTCHENS, CHAD, University Libraries  
HUTCHISON, LINDA, Secondary Education  
HUYNH, XUAN-XABIER, Modern  
and Classical Languages  
HUZURBAZAR, SNEHALATA V., Statistics  
HVIDSTON, DAVID, Professional Studies  
IAMS, HELEN, Family Practice  
INGWERSON, JENNIFER, Animal Science  
INNES, PAMELA J., Anthropology  
INOUYE, KEVIN, Theatre and Dance  
IPINA, LYNNE, Mathematics  
IRICK, ERIN, Family and Consumer Sciences  
ISAACS, BRANDON, Family Practice  
ISLAM, M. ANOWARUL, Plant Sciences  
JABBOUR, RANDA, Plant Sciences  
JACOBS, LANDEE, Theatre and Dance  
JACKSON, DARRELL D., Law  
JACKSON, LAURA UGLEAN,  
American Heritage Center  
JAFARI, FARHAD, Mathematics  
JAIME, ANGELA, Educational Studies  
JAMES, BARBARA, Nursing  
JANAK, EDWARD, Educational Studies  
JANG-CONDELL, HANNAH,  
Physics and Astronomy  
JANUS, THORSTEN M.,  
Economics and Finance  
JARMAN, MICHELLE, Wyoming  
Institute for Disabilities (WIND)  
JARVIS, DONALD L., Molecular Biology  
JENKINS, JAYNE M., Kinesiology and Health  
JENKINS, MARK, English  
JIN, SONG, Civil and Architectural Engineering  
JOHANNES, TAY W., Air Force ROTC  
JOHN, BARBARA E., Geology and Geophysics  
JOHNSON, ERIC N., Accounting  
JOHNSON, EVAN C., Kinesiology and Health  
JOHNSON, LINDA E., Nursing  
JOHNSON, PATRICK, Chemical and  
Petroleum Engineering  
JOHNSON, PAUL E., Physics and Astronomy  
JOHNSON, RAYMOND B., Family Practice  
JOHNSON, TRICIA GIOVACCO, Elementary/  
Early Childhood Education  
JONES, DAVID, Art  
JONES, DAVID L., Communication Disorders  
JONES, STEPHEN, Management  
and Marketing  
KALEN, SAM, Law  
KAMBUTU, JOHN, Educational Studies  
KAMP, MARIANNE R., History  
KASZUBA, JOHN P., SER,  
Geology and Geophysics  
KATHAN, DONNA, Nursing  
KATZMANN, JASON, Secondary Education  
KAWULOK, MELANIE, Nursing  
KEARLEY, TIMOTHY G., Law  
KEARNS, CASEY, Theatre and Dance  
KEEGAN, DANIEL, English  
KELLENNERS, THIJS, Ecosystem  
Science and Management  
KELLER, MARY, Religious Studies  
KELLY, ALEXANDRA, History, Anthropology  
KELLY, ROBERT D., Atmospheric Science  
KELLY, ROBERT L., Anthropology  
KEMPSON, DIANE A., Social Work

- KERR, GREG, Engineering and Applied Science
- KIDWELL, LINDA A., Accounting
- KIDWELL, ROLAND E., Management and Marketing
- KIHN, PAULA, Nursing
- KILANDER, GINNY, American Heritage Center
- KILTY, KEVIN, Civil and Architectural Engineering
- KIKUT, PATRICK, Art
- KING, JAMES D., Political Science
- KINNEY, KELLY, English
- KIRKMEYER, JASON, English
- KLADIANOS, JAMES, Civil and Architectural Engineering
- KLAGES, RICKI, Art
- KLEINSASSER, AUDREY M., Educational Studies
- KNIEVEL, MICHAEL, English
- KNIGHT, MARSHA F., Theatre and Dance
- KNISS, ANDREW, Plant Sciences
- KNOBLOCH, FRIEDA E., American Studies
- KOBBE, RYAN, Civil and Architectural Engineering
- KOBULNICKY, HENRY A., Physics and Astronomy
- KOCKEN, GREGORY, American Heritage Center
- KONCEL, EDWARD, Physics and Astronomy
- KOOIENGA, SARAH, Nursing
- KORFANTA, NICOLE, Environment and Natural Resources
- KORNFELD, MARCEL, Anthropology
- KOSKI, CHERYL, Nursing
- KRAFCZIK, JOSEPH, Modern and Classical Languages
- KRIST, AMY, Zoology and Physiology
- KRUEGER, JANELLE L., Pharmacy
- KRUEGER, KEM, Pharmacy
- KRUGER, DAVID, University Libraries
- KSAIBATI, KHALED, Civil and Architectural Engineering
- KUBELKA, JAN, Chemistry
- KUBICHEK, ROBERT F., Electrical and Computer Engineering
- KUZNETSOVA, MARIA I., Psychology
- KVENILD, CASSANDRA, University Libraries
- LAEGREID, RENEE, History
- LAEGREID, WILLIAM W., Veterinary Sciences
- LAKE, SCOTT, L., Animal Science
- LAMARTINE, NICOLE C., Music
- LANDEIRA, JOY, Modern and Classical Languages
- LANDREVILLE, KRISTEN, Communication and Journalism
- LANE, ANNE MARIE, American Heritage Center
- LANGER, PAMELA J., Molecular Biology
- LANIER, HAYLEY C., Zoology and Physiology
- LAPCHAROENSAP, RATTAWUT, English
- LARSON, CAROLYNE R., History
- LARSON, MARY LOU, Anthropology
- LARSON-MEYER, D. ENETTE, Family and Consumer Sciences
- LATCHININSKY, ALEXANDRE V., Ecosystem Science and Management
- LAUENROTH, WILLIAM, Botany
- LaVANCHY, JENNIFER, Modern and Classical Languages
- LEBO, ZACHARY J., Atmospheric Science
- LEE, LONG, Mathematics
- LEFEBVRE, LEAH, Communication and Journalism
- LEGG, DAVID E., Ecosystem Science and Management
- LEGLEITER, CARL J., Geography
- LEGOWSKI, STANISLAW F., Electrical and Computer Engineering
- LEHMANN, TERESA, Chemistry
- LEONARD, BRIAN, Chemistry
- LEONARD, JACQUELINE, Science and Mathematics Teaching Center, Early Childhood Education
- LePARD, ALICIA, Nursing
- LEVY, DANIEL, Molecular Biology
- LEWELLYN, KRISTA B., Management and Marketing
- LI, DONGMEI (KATIE), Chemical and Petroleum Engineering
- LI, LI, Communications and Journalism
- LIEBMAN, MICHAEL, Family and Consumer Sciences
- LINDMIER, WILLIAM, Army ROTC
- LINDSTROM, GRANT L., Management and Marketing
- LINN, BECKY, Pharmacy
- LIPING, WANG, Civil and Architectural Engineering
- LIU, RONGSONG, Mathematics; Zoology and Physiology
- LIU, XIAOHONG, Atmospheric Science
- LOCKE, STEVEN, Elementary/ Early Childhood Education
- LOCKWOOD, JEFFREY A., Philosophy
- LOFFREDA, BETH, American Studies
- LOGAN, BARBARA, History, Gender and Women's Studies
- LOWE, SUE, Nursing
- LUDDEN, PAUL A., Animal Science
- LUND, TERI, Nursing
- LUTZ, PAULA M., Zoology and Physiology, A&S Dean
- LYFORD, MARK, Life Sciences, Botany
- LYNG, GREGORY, Mathematics
- MACAULAY, DAVID, University Libraries
- MACHALEK, RICHARD S., Sociology
- MADRID, SAMARA, Elementary and Early Childhood Education
- MAGNUSON, ERIC, Army ROTC
- MAHAPATRA, NEELY, Social Work
- MAHVAN, TRACY D., Pharmacy
- MAIER, SHANNON BOWEN, American Heritage Center
- MALLICK, SUBHASHIS, SER/ Geology and Geophysics
- MALM, RONALD L., Family Practice
- MANI, KUMARAN, Molecular Biology
- MANN, ALLISON, Pharmacy
- MANYAK, PATRICK, Elementary/ Early Childhood Education
- MARKLEY, BENJAMIN, Music
- MARKS, CLIFFORD J., English
- MARTIN, ERICH, Army ROTC
- MARTIN, LINDA G., Pharmacy
- MARTINCHICK, GAYLE, Nursing
- MARTINSEN, RANDI, Geology and Geophysics
- MASON, CHARLES F., Economics and Finance
- MATHEWS, JAMIE, Nursing
- MAVRIPLIS, DIMITRI J., Mechanical Engineering
- MAYER, JENNIFER, University Libraries
- MAZUR, TIMOTHY, Management and Marketing
- McALLISTER, TYRRELL, Mathematics
- McCARREN, MATTHEW, Theatre and Dance
- McCARTHY, DEBORAH, University Libraries
- McCONNELL, JASON, Political Science
- McCORMICK, RICHARD J., Animal Science
- McCRACKEN-FLESHER, CAROLINE, English
- McCREA, SEAN M., Psychology
- McDONALD, DAVID B., Zoology and Physiology
- McELROY, BRANDON, Geology and Geophysics
- McGEE, BLAKE, Music
- McGEE, NANCY, Nursing
- McGINITY, RICHARD C., Management and Marketing
- McGRIFF, DEBORAH, Professional Studies
- McINROY, JOHN E., Electrical and Computer Engineering
- McKEE, JOHN, Air Force ROTC
- McKIBBIN, CHRISTINE L., Psychology
- McKIM, COURTNEY, Professional Studies
- McLEOD, DON, Agricultural and Applied Economics
- McMANUS, PATRICK, Civil and Architectural Engineering
- McTIGUE, KRISTIN, Family and Consumer Sciences
- MEALOR, BRIAN, Plant Sciences
- MEANS, JEFFREY D., History
- MEANS, WARRIE J., Animal Science
- MEREDITH, SCOTT, Music
- MESENTER, DAVID, History; Global and Area Studies
- MICHALEK, RUDI, Physics and Astronomy
- MIELKE, TAMMY, Elementary and Early Childhood Education
- MILES, NOAH, Modern and Classical Languages
- MILLER, HOLLY, Nursing
- MILLER, KIMBERLY, Elementary and Early Childhood Education
- MILLER, KURT W., Molecular Biology
- MILLER, MARCIE, Civil and Architectural Engineering
- MILLER, MICHAEL, Family Practice
- MILLER, MYRNA M., Veterinary Sciences

- MILLER, SCOTT N., Ecosystem Science and Management
- MILLER, STEVEN L., Botany
- MINCKLEY, TOM, Geography
- MINEAR, MEREDITH, Psychology
- MINTON, ELIZABETH, Management and Marketing
- MITTELSTAEDT, JOHN D., Management and Marketing
- MOLDENHAUER, SUSAN, Art Museum
- MOLSKI, AMANDA, Nursing
- MONTEITH, KEVIN, Zoology and Physiology
- MOORHOUSE, G. ERIC, Mathematics
- MORAN, PETER WILLIAM, Elementary/Early Childhood Education
- MORGAN, MICHAEL M., Professional Studies
- MORSE, TAMI, University Libraries
- MOTRIUK-SMITH, DAGMARA, UW-Casper
- MOULAND, DENNIS, Civil and Architectural Engineering
- MUDDIMAN, ASHLEY, Communication and Journalism
- MUKAI, DAVID J., Civil and Architectural Engineering
- MUKNAHALLIPATNA, SURESH S., Electrical and Computer Engineering
- MUNDT, HANNELORE, Modern and Classical Languages
- MURDOCK, MARGARET M. Political Science
- MURPHY, MELANIE, Ecosystem Science and Management
- MURPHY, MELISSA, Anthropology
- MURPHY, SHANE, Atmospheric Science
- MYERS, ADAM, Physics and Astronomy
- MYERS, JAMES D., Geology and Geophysics
- MYERS, JOHN, Chemical and Petroleum Engineering
- MYRAN, LEENA, Pharmacy
- NAIR, SREEJAYAN, Pharmacy
- NASCHOLD, FELIX, Economics and Finance
- NAUGHTON, JONATHAN W., Mechanical Engineering
- NAVRATIL, AMY M., Zoology and Physiology
- NELSON, BURRELL, Botany
- NELSON, MICHAEL L., University Libraries
- NEMETZ, DEBORAH LYNNE, Nursing
- NEWELL, MARCIA, Nursing
- NG, KAM, Civil and Architectural Engineering
- NGANGA, LYDIAH, Elementary/Early Childhood Education
- NGUYEN, THANH-NGA, Pharmacy
- NIELSON, KRISTY, Nursing
- NIEMOLLER, JEANINE, Nursing
- NIU, ZHUANG, Mathematics
- NORTH, CHRISTOPHER, Life Sciences, Botany
- NORTHROP, KATE, English
- NORTON, JAY, Ecosystem Science and Management
- NORTON, URSZULA, Plant Sciences
- NOVAK, DOMEN, Electrical and Computer Engineering
- NOVOGRODSKY, NOAH B., Law
- NOY, SHIRI, Sociology
- NUNEZ, NARINA L., Psychology
- NYE, ERIC W., English
- OAKEY, JOHN, Chemical and Petroleum Engineering
- O'BRIEN, JOHN F., Electrical and Computer Engineering
- O'BRIEN, MARIANA, Political Science
- O'BRIEN, YELENA, Electrical and Computer Engineering
- OBERT, JULIA, English
- O'TOOLE, DONAL T., Veterinary Sciences
- OGDEN, FRED L., Civil and Architectural Engineering/Environment and Natural Resources
- OGGERO, ELENA, Electrical and Computer Engineering
- OHARA, NORIAKI, Civil and Architectural Engineering
- ONETO, STEPHANIE A., Management and Marketing
- ONYSKO, MARY, Pharmacy
- PAFUNDA, DANIELLE, English
- PAGE, JAMES, Family Practice
- PAGNACCO, GUIDO, Electrical and Computer Engineering
- PAIGE, VIRGINIA B., Ecosystem Science and Management
- PAINTER, JENNIFER, Nursing
- PAINTER, MATTHEW A., Sociology
- PAISLEY, STEVEN I., Animal Science
- PANTER, KAREN, Plant Sciences
- PARISH, THOMAS R., Atmospheric Science
- PARKER, SYLVIA, Science and Mathematics Teaching Center
- PARKINSON, BRUCE A., Chemistry, SER
- PARKINSON, JERRY R., Law
- PARKS, DOUGLAS S., Family Practice
- PAROLIN, PETER, English
- PARSEKIAN, ANDREW, Civil Engineering; Geology and Geophysics
- PASEK, JUDITH E., University Libraries
- PATTON, TRACEY OWENS, African American and Diaspora Studies, Communication and Journalism
- PATTON, MARCIA E., Elementary/Early Childhood Education
- PECK, ANN, Mechanical Engineering
- PECK, DANNELE, Agricultural and Applied Economics
- PENDALL, ELISE, Botany
- PENNINGROTH, SUZANNA L., Psychology
- PEPPER, CAROLYN M., Psychology
- PERSICHITTE, KAY, Professional Studies
- PERSON, DEBORA, Law
- PERSON, MARK, Modern and Classical Languages
- PETERSEN, DOUGLAS B., Communication Disorders
- PETERSON, C. MARK, Management and Marketing
- PETRINI, SHAWN, Nursing
- PEXTON, VALERIE, English
- PHILLIPS, LORI J., University Libraries
- PHILLIPS, OWEN R., Economics and Finance
- PICCORELLI, JUSTIN, Political Science
- PICKETT, BRENT, Political Science
- PIERCE, MICHAEL, Physics and Astronomy
- PIERRE, JOHN W., Electrical and Computer Engineering
- PIKAL, JON M., Electrical and Computer Engineering
- PIMBLOTT, KERRY, African American and Diaspora Studies and History
- PIRI, MOHAMMAD, Chemical and Petroleum Engineering
- PISHKO, MICHAEL, Chemical and Petroleum Engineering
- PLAYTON, DONA, Law
- PLUMB, TAWNYA, Law
- POBLETE, JOANNA, History
- POLYAKOV, PETER, Mathematics
- PORTER, CHRISTINE, Kinesiology and Health
- POYER, LIN A., Anthropology
- PRATHER, JONATHAN, Zoology and Physiology
- PRATT, KARA, Zoology and Physiology
- PRICE SCHULTZ, CINDY J., Communication and Journalism
- PRIDGEN, MARY D., Law
- PRITCHETT, SUZAN M., Law
- PROCTOR, J'LAINE, Nursing
- PROCTOR, JULIA, University Libraries
- PRZYGOCKI, JAMES, Music
- PUCKETT, JAY A., Civil and Architectural Engineering
- PUTZER, MARY ANNE, Nursing
- PUTREVU, SANJAY, Management and Marketing
- QUAGGIN HARKIN, ALISON, Wyoming Institute for Disabilities (WIND)
- RADDAOUI, ALI, Religious Studies; Global and Area Studies
- RADOSZ, MACIEJ, Chemical and Petroleum Engineering
- RAHEL, FRANK J., Zoology and Physiology
- RAISBECK, MERL F., Veterinary Sciences
- RASHFORD, BENJAMIN, Agricultural and Applied Economics
- RASKA, KIMBERLY, Nursing
- READDY, R. TUCKER, Kinesiology and Health
- REDDY, KATTA J., Ecosystem Science and Management
- REGAN, DARCY, Wyoming Institute for Disabilities (WIND)
- REHWALDT, MARK, Civil and Architectural Engineering
- REN, JUN, Pharmacy
- RICUPERO, BRYAN, University Libraries
- RIEBE, CLIFFORD, Geology and Geophysics
- RIGHETTI, SUZAN, Law
- RINER, NICOLE, Music
- RITCHIE, MARK, Art
- RITTEN, CHIAN, Agricultural and Applied Economics
- RITTEN, JOHN, Agricultural and Applied Economics
- RITTENBURG, TERRI L., Management and Marketing

- ROBERTS, AMY, Elementary/  
Early Childhood Education
- ROBERTS, PHILIP J., History
- ROBERTS, REBECCA, Communication  
and Journalism
- ROBERTSON, BLAIR, Statistics
- ROBERTSON, DANA, Elementary and  
Early Childhood Education
- ROBINSON, BARBARA, Nursing
- ROBISON, JASON, Law
- ROBISON, RANI, Art
- ROBITAILLE, BETH, Family Practice
- RODDICK, DEAN M., Chemistry
- RODGERS, J. DANIEL, Ecosystem  
Science and Management
- RODI, ALFRED R., Atmospheric Science
- RODRIGUEZ HICKS, SONIA A.,  
Modern and Classical Languages
- ROMERO, ALAN, Law
- ROMTVEDT, DAVID, English
- ROOT-ELLEGE, SANDRA, Wyoming  
Institute for Disabilities (WIND)
- ROSA, JOSE A., Management and Marketing
- ROSS, CATHERINE L.,  
Communication Disorders
- ROTH, DON ALLEN, Molecular Biology
- RUBIO-WALLACE, SHERRIE, Nursing
- RULE, DANIEL C., Animal Science
- RUSH, LESLIE, Secondary Education
- RUSSEL, BAILEY, Art
- RUSSELL, CASKEY, English
- RUSSELL, DOUG, Art
- SAILOR, RACHEL, Art
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