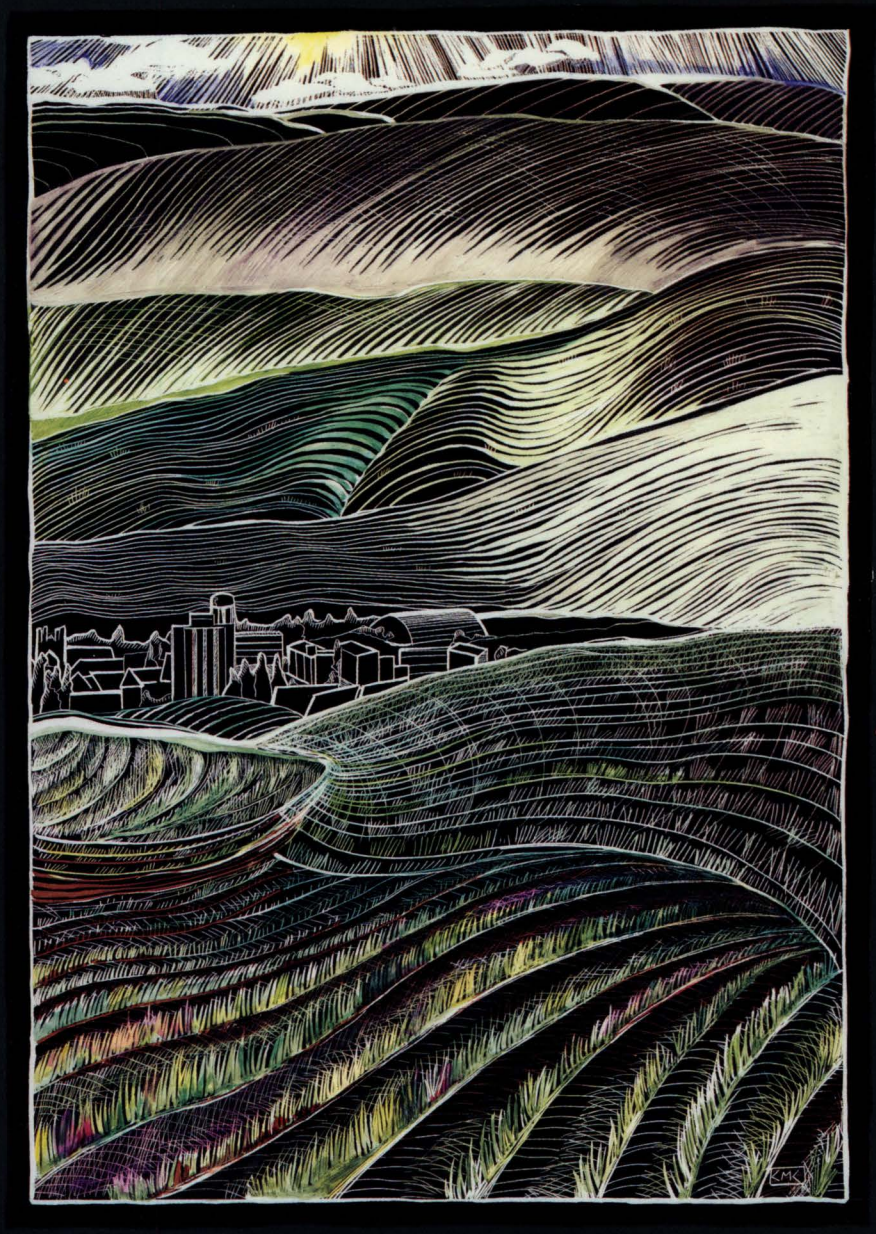
Bulletin



University of Idaho

1991 General Catalog Edition

A university is . . . an *alma mater,*
knowing her children one by one,
not a foundry, or a mint, or a treadmill.
—John Henry Newman

The task of a university is the creation
of the future, so far as rational thought
and civilized modes of appreciation
can affect the issue.
—Alfred North Whitehead

For sources of additional information,
turn to the inside back cover.

University of Idaho
BULLETIN (USPS 651-360)
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Academic Calendar for 1991-92

Dates in this calendar are subject to change without notice; dates appearing in admission and registration instructions take precedence over those listed below.

FALL SEMESTER 1991

Application closing dates for new and former students—see "Admission to the University" in the catalog
Last day of preregistration advising and official opening date of fall semester ..... Thursday, Aug. 22
Residual registration ..... Thursday, Aug. 22
Classes begin (7:30 a.m.) ..... Monday, Aug. 26
Labor Day, a holiday ..... Monday, Sept. 2
Last day to register without paying late-registration fee ..... Monday, Sept. 9
Last day to add course, change section, or change from audit to regular credit without special permission ..... Monday, Sept. 9
Last day to change from pass-fail to regular-grade basis ..... Monday, Sept. 9
Last day to avoid paying drop-add fee ..... Monday, Sept. 9
Last day to turn in "Partial Enrollment" and "Senior in 500s Course" forms to the Graduate Office ..... Monday, Sept. 9
Last day to file applications for baccalaureate degrees to be awarded in December ..... Tuesday, Sept. 10
Last day to file applications for advanced degrees to be awarded in December ..... Monday, Sept. 16
Last day to withdraw from a course without having grade of W recorded—in the case of accelerated or short courses, when no more than 12.5 percent of the class-meeting hours have been completed ..... Monday, Sept. 23
Last day to reduce number of credits for which registered in a course or change from regular-grade to pass-fail basis ..... Monday, Sept. 23
Last day to change from regular credit to audit without having grade of W recorded ..... Monday, Sept. 23
Last day to register by paying late-registration fee but without petition ..... Monday, Sept. 23
Freshman early warning grade reports due ..... Wednesday, Sept. 25
Last day to remove or extend incompletes ..... Monday, Oct. 7
Classes WILL MEET this date, even though Columbus Day is a holiday ..... Monday, Oct. 14
Last day for midsemester examinations ..... Friday, Oct. 18
Midsemester grade reports due (1:30 p.m.) ..... Monday, Oct. 21
Writing Proficiency Test for transfer students (7 p.m.) ..... Thursday, Oct. 24
Last day to withdraw from a course or from the university—in the case of accelerated or short courses, after 12.5 percent but less than 60 percent of the class-meeting hours have been completed ..... Friday, Nov. 1
Last day to change from regular credit to audit ..... Friday, Nov. 1
Classes WILL MEET this date, even though Veterans' Day is a holiday ..... Monday, Nov. 11
Preregistration advising begins ..... Monday, Nov. 11
Fall recess begins (5:30 p.m.) ..... Friday, Nov. 22
Fall recess ends (7:30 a.m.) ..... Monday, Dec. 2
Preregistration for spring-semester courses begins ..... Monday, Dec. 2
Field-trip completion deadline (7:30 a.m.) ..... Monday, Dec. 9
No-examination week ..... Monday-Friday, Dec. 9-13
Last day to report grades for challenged courses ..... Friday, Dec. 13
Final examinations ..... Monday-Friday, Dec. 16-20
Last day to file theses, dissertations, abstracts, and results of comprehensive examinations for graduate degrees to be awarded in December ..... Friday, Dec. 20
Close of fall semester (5:30 p.m.) ..... Friday, Dec. 20
Semester grade reports due (5 p.m.) ..... Monday, Dec. 23

SPRING SEMESTER 1992

Application closing dates for new and former students—see "Admission to the University" in the catalog.
Last day of preregistration advising and official opening date of spring semester ..... Thursday, Jan. 9
Residual registration ..... Thursday, Jan. 9
Classes begin (7:30 a.m.) ..... Monday, Jan. 13
Martin Luther King-Idaho Human Rights Day, a holiday ..... Monday, Jan. 20
Last day to register without paying late-registration fee ..... Monday, Jan. 27
Last day to add course, change section, or change from audit to regular credit without special permission ..... Monday, Jan. 27
Last day to change from pass-fail to regular-grade basis ..... Monday, Jan. 27
Last day to avoid paying drop-add fee ..... Monday, Jan. 27
Last day to turn in "Partial Enrollment" and "Senior in 500s Course" forms to the Graduate Office ..... Monday, Jan. 27
Last day to file applications for baccalaureate degrees to be awarded in May ..... Monday, Jan. 27
Last day to file applications for advanced degrees to be awarded in May ..... Monday, Feb. 3
Last day to withdraw from a course without having grade of W recorded—in the case of accelerated or short courses, when no more than 12.5 percent of the class-meeting hours have been completed ..... Monday, Feb. 10
Last day to reduce number of credits for which registered in a course or change from regular-grade to pass-fail basis ..... Monday, Feb. 10
Last day to change from regular credit to audit without having grade of W recorded ..... Monday, Feb. 10
Last day to register by paying late-registration fee but without petition ..... Monday, Feb. 10
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Presidents' Day, a holiday ..... Monday, Feb. 17
Last day to remove or extend incompletes ..... Monday, Feb. 24
Last day for midsemester examinations ..... Friday, March 13
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No-examination week	Monday-Friday, May 4-8
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Semester grade reports due (5 p.m.)	Monday, May 18

Regents and Administration

(December 1990)

The Regents of the University of Idaho

BOARD MEMBERS

Gary G. Fay, *President,* Twin Falls (1992*)
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Ronald W. Force, *M.S., Acting Dean of Library Services*
Matt E. Telin, *M.Ed., Director of Admissions and Registrar*

Major Academic Divisions

COLLEGE OF GRADUATE STUDIES

Jean'ne M. Shreeve, *Ph.D., Dean*

UNDERGRADUATE COLLEGES**

Letters and Science—Kurt O. Olsson, *Ph.D., Dean*
Agriculture—A. Larry Branen, *Ph.D., Dean*
Engineering—Richard T Jacobsen, *Ph.D., Dean*
Law—Sheldon A. Vincenti, *J.D., Dean*
Mines and Earth Resources—Robert W. Bartlett, *Ph.D., Dean*
Forestry, Wildlife and Range Sciences—John C. Hendee, *Ph.D., Dean*
Education—N. Dale Gentry, *Ph.D., Dean*
Business and Economics—Byron J. Dangerfield, *Ph.D., Acting Dean*
Art and Architecture—George M. Simmons, *Ph.D., Dean*

*Date current appointment expires.
**Listed in the order of their founding.

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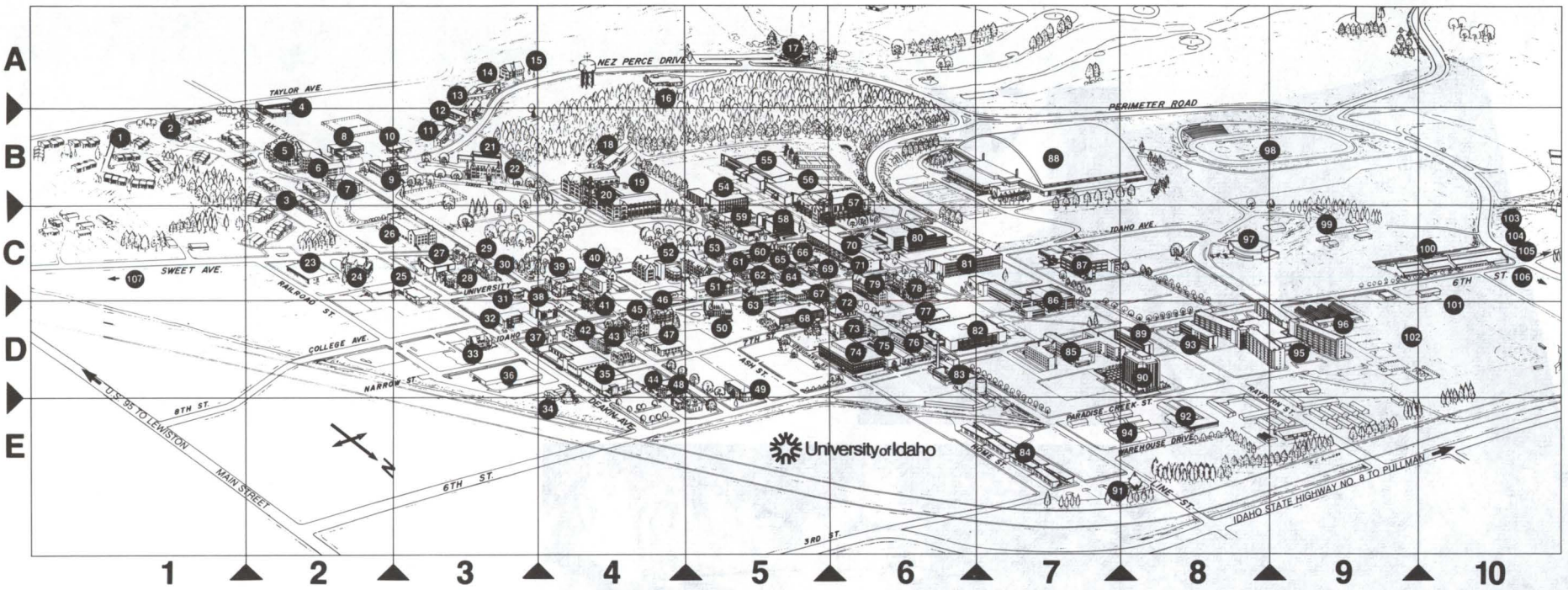

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105	Animal Sciences Farm	C-10
106	Entomology Research Lab (Manis)	C-10
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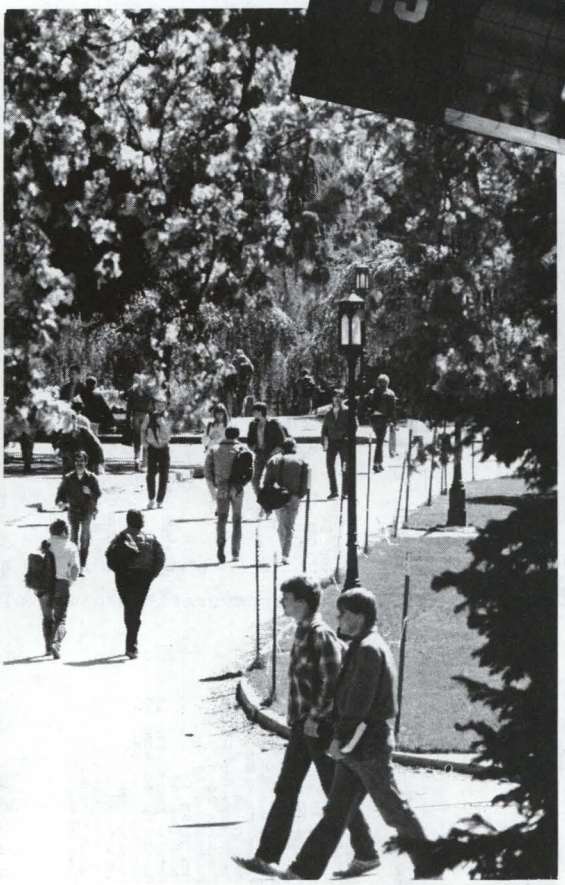
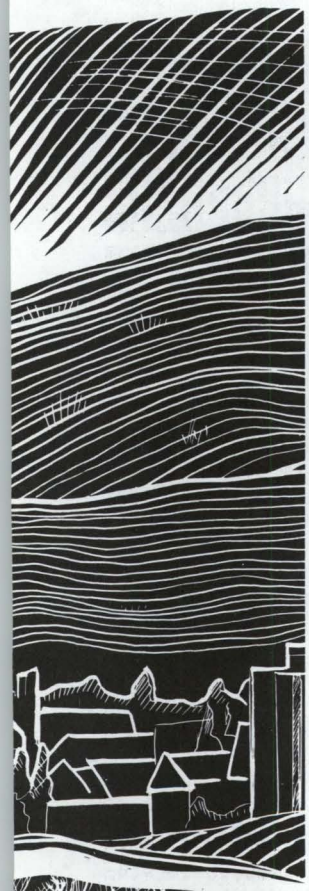




The University

The University of Idaho was created in 1889 by a statute of the 15th territorial legislature. Commonly known as the university charter, that act became part of the state constitution when Idaho was admitted to the Union in 1890.

The university is a publicly supported comprehensive land-grant institution with principal responsibility in Idaho for performing research and granting the Doctor of Philosophy degree. The liberal arts and sciences, offered through the College of Letters and Science, are the heart of the university's educational programs. The primary areas of statewide responsibility of the university are agriculture, architecture, engineering, forestry and wildlife, mining and metallurgy (including international programs in those areas), foreign languages, and law.

Additional university responsibilities include programs in business, economics, and education as well as the regional medical and veterinary medical education programs in which the state participates.

To assist with its statewide mission, the university maintains resident instructional centers in Coeur d'Alene, Boise, and Idaho Falls, extension offices in 42 of Idaho's 44 counties, research and extension centers in Sandpoint, Moscow, Parma, Caldwell, Kimberly, Aberdeen, Tetonia, and Dubois, and field stations at McCall, Clark Fork, Point Springs, and the Taylor Ranch in central Idaho. Through its international programs, the university extends its services to many other countries.

About 9,500 students from all states and 61 foreign countries choose programs from a vast array of disciplines. Strong undergraduate programs are coupled with nationally recognized research and scholarly achievements. There are more than 700 faculty members in teaching and research, and 1,400 staff and professional personnel.

The University Library contains over 1.6 million items of books, bound periodicals, microforms, and U.S. government publications. These resources, together with the libraries at Washington State University (eight miles to the west), equal those of major metropolitan areas.

The Moscow campus and adjacent farms cover nearly 800 acres. Other university lands, including the nearby university farms and experimental forests, exceed 10,000 acres.

The university is proud of its friendly campus atmosphere and sense of community. For example, the tradition of "Hello Walk" leading to the Administration Building dates from the 1920s, when the university president greeted students and members of the faculty and staff with a warm hello and friendly smile on his way to work. The university has granted more than 61,000 degrees since its founding, including 1,552 to the class of 1989.

The feeling of camaraderie that pervades the campus extends to Moscow, the university's "hometown." It is a thriving community of 17,000 friendly people located in the northern part of the state about 90 miles southeast of Spokane, Washington.

Moscow is the gateway to a natural wonderland. The surrounding Palouse hills and the mountains and lakes of northern Idaho provide a scenic background for university facilities. Skiing, boating, and other outdoor recreation resources are available within easy driving distance. They include the Sawtooth and Hells Canyon national recreation areas, Frank Church River of No Return Wilderness, and scenic rivers such as the Snake, Clearwater, Salmon, Lochsa, and Selway.

The university is a member of the National Association of State Universities and Land-Grant Colleges and is accredited by the Northwest Association of Schools and Colleges. Additional approval or accreditation for specific programs has been granted by the following organizations: American Bar Association, American Chemical Society, American Dietetics Association, Association of American Law Schools, Accreditation Board for Engineering and Technology, National Architectural Accrediting Board, American Society of Landscape Architects, National Association of Schools of Music, National Council for Accreditation of Teacher Education, Society of American Foresters, National Association of School Psychologists, and the Council for the Accreditation of Counseling and Related Educational Programs.

General Honorary Societies

The university has long possessed nationally recognized marks of excellence, including chapters of national honorary and scholarship societies in practically every specialized field and chapters of the following general honorary societies: Phi Beta Kappa (since 1926), Phi Kappa Phi (since 1960), and Sigma Xi (since 1922).

Phi Beta Kappa. To qualify for nomination to Phi Beta Kappa, a candidate must have achieved a cumulative grade-point average of at least 3.33 and have fulfilled the following distribution requirements: humanities (7 semester credits); laboratory sciences and/or mathematics (11 semester credits); social sciences (7 semester credits); foreign language (completion of a single foreign language through the intermediate level, or the equivalent —16 semester credits or 4 high-school units in a single foreign language).

Phi Kappa Phi. To qualify for nomination by the local chapter of Phi Kappa Phi, a candidate must be (1) registered at UI for at least one year and (2) enrolled in the final period of his or her junior year and rank scholastically in the upper 5 percent of the class or a senior enrolled in a course of study leading to a baccalaureate degree and rank scholastically in the upper 10 percent of his or her class.

Sigma Xi. To qualify for nomination to associate membership in Sigma Xi, a student must have shown marked aptitude for research in some field of pure or applied science. An associate member must have shown noteworthy achievement as an original investigator in some field of pure or applied science to qualify for nomination to full membership.

Libraries

The University Library and Law Library contain collections of over 1.6 million items, to which approximately 70,000 items are added annually. The library receives 12,750 serials and 117 newspapers and, as the regional depository in Idaho for U.S. government documents, houses a collection of over 650,000 official publications. The U.S. Geological Survey and the U.S. Defense Mapping Agency also use the library as a depository; there are now about 140,000 maps in the library's collection.

Subject librarians administer three open-stack divisional libraries (humanities, social sciences, and science/technology), which have been organized to conform with the academic divisions of the university. The library shares the university objectives of teaching, research, and service, and offers individual and group instruction in elementary and advanced techniques of library research.

The library is a depository for the U.S. Patent Office and serves as a state affiliate for the U.S. Geological Survey's National Cartographic Information Center.

The Special Collections Department contains historical photographs, manuscripts, and university archives, and books that constitute a unique assemblage, such as the Day-Northwest Collection, which consists of over 12,600 volumes on Idaho and the Pacific Northwest.

The library also maintains a Browsing Room composed of books of current interest, popular periodicals, and state, out-of-state, and foreign newspapers.

The library is air-conditioned, is open 109 hours a week during the regular school term, and provides photocopying at a nominal fee. Free hand calculators and portable and desktop computers are available for use in the library. Computer literature searches are available for a fee.

There is a reciprocal use agreement between the UI and WSU libraries. A daily shuttle service runs between the two libraries to pick up and return library materials. As a member of the Western Library Network and OCLC, the library can provide users access to the collections of other libraries throughout the country.

Galleries

The University Gallery occupies the main floor of Ridenbaugh Hall on campus (corner of Blake Street and Campus Drive); it is open during the regular academic year. The Prichard Gallery is located at 414 South Main Street in downtown Moscow; it is open throughout the year. All gallery programs and exhibitions are open to the public and no admission is charged.

The galleries serve the university, community, state, and region and are the principal facilities emphasizing the visual arts in northern Idaho. Through the galleries' rotation of exhibits, visitors may see examples of the full range of visual arts, including architecture, landscape architecture, interior design, and photography as well as the traditional art media. The objectives of these galleries are to provide opportunities for local, regional, and national artists to exhibit their work, a means by which visitors' awareness and appreciation of the arts is heightened, and an excellent teaching device. Ties between the university and local and regional communities are strengthened by the outreach efforts of the Prichard Gallery, which are coordinated by an advisory board composed of university and community leaders.

Exhibitions mounted each year traditionally include those by faculty members and undergraduate and graduate students from the College of Art and Architecture. Public receptions held in connection with some exhibitions, occasional musical performances presented at the galleries, and seminars with guest artists and lecturers are ways in which the gallery broadens its impact.

The gallery facilities are administered through the College of Art and Architecture by a full-time director and the programs and exhibitions are coordinated by the Gallery Committee of the college faculty.

Computer Services

Computer Services provides facilities for instructional, research, and computational needs of members of the university community, for federal, state, and other governmental agencies, and for other groups and individuals when this service appears to be in the best interests of the university and the state of Idaho.

The center is equipped with two IBM 4300 computers with related systems and remote terminals. It maintains a library of computer programs and provides consulting assistance in programming and in the use of the computer facilities.

Ten microcomputer laboratories are available for teaching and student use.

The center also supports a campus-wide office automation network for word processing and electronic mail.

A microcomputer sales outlet is available to serve faculty and staff members, students, and departments.

Short courses in computer languages, job control, and related subjects are offered periodically. Formal courses in programming and computer science are offered by the Department of Computer Science.

Idaho Water Resources Research Institute

The Idaho Water Resources Research Institute was established at UI by the regents on October 24, 1963. Subsequently, the institute was designated by the Office of Water Resources Research of the U.S. Department of the Interior to stimulate, sponsor, coordinate, and supplement research programs in the field of water resources. The institute serves the state by developing and coordinating water research programs intended to assure the state, region, and nation adequate supplies of high-quality water.

The area of water resources planning, development, and management is a composite of many disciplines. Consequently, the Idaho Water Resources Research Institute believes that educational needs in these areas are best achieved by individuals with strong basic education in a traditional academic department tempered by programs of study in water resources problems and professional practice. The university has developed procedures that encourage existing schools and departments to strengthen their programs in the light of the special needs for water resources. The Idaho Water Resources Research Institute has coordinated master's and doctoral programs in several disciplines and specializations through various participating divisional programs.

The objectives of the institution are to: (1) promote water resources research and coordinate the efforts of the various university divisions and departments involved in water resources research; (2) strengthen and coordinate water-related undergraduate and graduate programs and course offerings so that the university can supply well-trained teachers and leaders; and (3) develop, gather, and disseminate research findings within the state universities and to various federal, state, local, and civic organizations interested in water resources.

Institute for Materials and Advanced Processes (IMAP)

The Institute for Materials and Advanced Processes (IMAP), composed of scientists from a number of colleges and disciplines within the University of Idaho, supports, directs, and coordinates research in the areas of materials and advanced processing. The former area encompasses work in strategic and critical materials, alloy evaluation, and composite materials development. The latter includes research on materials processing using high energy sources such as plasma, laser, and electron beam as well as processing of polymer, ceramic, and composite materials.

A current major program in conjunction with the Idaho National Engineering Laboratory (INEL) is evaluating the potential for using new processes and advanced materials as substitutes for strategic and critical materials.

Pending programs in the advanced materials arena will cover topics including advanced metal matrix composites, intermetallic compounds, hydrogen effects in metals, and innovative ceramic concepts.

Pervasive to the whole activity is application of material science and engineering and transition of the research programs to real-world applications.

University of Idaho Press

The University of Idaho Press, founded in 1972, publishes scholarly books in the humanities, the social sciences, and the natural sciences. It serves the state, the scholarly community, and the university through a publishing program intended to exemplify the academic standards of the faculty and the significance of university research for society as a whole.

The Press issues seasonal catalogs of its new titles and books continuing in print. The Press publishes the work of academic and professional authors from across the United States and from Canada, the United Kingdom, and Europe. University of Idaho Press titles are sold throughout the West and across the country at university and retail bookstores, and to libraries and academic audiences around the world.

University Research Office

The University Research Office serves as the coordinating center for research and development activities at the university. While colleges, departments, and other units commonly develop and admin-

ister their own research programs, the Research Office assists by organizing and promoting research and development activities, by ensuring that policies and procedures are recognized and followed, by providing grant, contract, and foundation information, and every possible assistance to the faculty, staff, and students in order to increase UI's competitiveness. All grant and contract proposals are processed and recorded.

Working very closely with the associate vice president for research is the Research Council, the faculty's standing committee involved with development of research policy and overseeing policy implementation. The council serves to resolve differences in interpretation and implementation of these policies. Additionally, the council acts as the peer review board in the university's internal competitive grants programs.

Idaho Research Foundation

The Idaho Research Foundation, Inc., is an independent entity that promotes educational and research objectives of the universities and not-for-profit research organizations of Idaho; specifically, to transfer technologies developed in these institutions to the private economy by (a) carrying on and supporting research programs that will be in the public's interest; (b) encouraging, fostering, aiding, and conducting scientific and industrial investigations and research; (c) training and developing persons for the conduct of such investigations and research; (d) disseminating scientific knowledge and technical information; (e) encouraging and assisting researchers and inventors by providing the means, methods, and agencies by which their scientific discoveries, inventions, processes, and scholarly works may be developed, applied, patented, and copyrighted; and (f) encouraging the commercial development of patent rights and other research.

Electron Microscopy Center

A campus-wide facility, including scanning and transmission electron microscopes and energy-dispersive x-ray microanalysis, is available for use in teaching, research, and service. Located in the Veterinary Science complex at the western edge of the campus, this facility is available to students and faculty members. Information concerning use of the EM Center may be secured directly from the facility or through the University Research Office.

Laboratory Animal Research Facility

A centrally located facility for housing and maintaining small animals for use in teaching and research is available to faculty members and students. Information concerning space availability, use, and services provided is available through the University Research Office or through the facility itself.

Degrees Granted

On completion of specific courses of study and recommendation of the faculty, the degrees listed below are granted by the Regents of the University of Idaho. In addition, the Certificate of General Proficiency is granted to students who complete specified lower-division educational programs at the UI/Idaho Falls Center for Higher Education.

Baccalaureate Degrees

Bachelor of Arts, B.A.
Bachelor of Science, B.S.
Bachelor of Science in
- Agricultural Economics, B.S.Ag.Econ.
- Agricultural Education, B.S.Ag.Ed.
- Agricultural Engineering, B.S.Ag.E.
- Agricultural Mechanization, B.S.Ag.Mech.
- Animal Science, B.S.An.Sc.
- Art Education, B.S.Art Ed.
- Bacteriology, B.S.Bact.
- Business, B.S.Bus.
- Business Education, B.S.Bus.Ed.
- Cartography, B.S.Cart.
- Chemical Engineering, B.S.Ch.E.
- Civil Engineering, B.S.C.E.
- Computer Engineering, B.S.Comp.E.
- Computer Science, B.S.C.S.
- Education, B.S.Ed.
- Electrical Engineering, B.S.E.E.
- Entomology, B.S.Ent.
- Fishery Resources, B.S.Fish.Res.
- Forest Products, B.S.For.Prod.
- Forest Resources, B.S.For.Res.
- General Agriculture, B.S.Gen.Ag.
- Geography, B.S.Geog.
- Geological Engineering, B.S.Geol.E.
- Geology, B.S.Geol.
- Interdisciplinary Studies, B.S.I.S.
- Home Economics, B.S.H.Ec.
- Manufacturing Engineering, B.S.Mfg.E.
- Mechanical Engineering, B.S.M.E.
- Metallurgical Engineering, B.S.Met.E.
- Mining Engineering, B.S.Min.E.
- Office Administration, B.S.O.Ad.
- Physical Education, B.S.P.E.
- Plant Protection, B.S.Pl.Prot.
- Plant Science, B.S.Pl.Sc.
- Range Resources, B.S.Range Res.
- Recreation, B.S.Rec.
- Resource Recreation and Tourism, B.S.Res.Rc.
- Soil Science, B.S.Soil Sc.
- Veterinary Science, B.S.Vet.Sc.
- Wildlife Resources, B.S.Wildl.Res.

Bachelor of Applied Physics, B.Appl.Phys.
Bachelor of Architecture, B.Arch.
Bachelor of Dance, B.Dan.
Bachelor of Fine Arts, B.F.A.
Bachelor of General Studies, B.G.S.
Bachelor of Landscape Architecture, B.L.Arch.
Bachelor of Music, B.Mus.
Bachelor of Naval Science, B.N.S.
Bachelor of Technology, B.Tech.

Master's Degrees

Master of Arts, M.A.
Master of Science, M.S.
Master of Architecture, M.Arch.
Master of Arts in Teaching, M.A.T.
Master of Education, M.Ed.
Master of Engineering, M.Engr.
Master of Fine Arts, M.F.A.
Master of Forestry, M.F.
Master of Music, M.Mus.
Master of Natural Science, M.Nat.Sc.
Master of Public Administration, M.P.A.

Specialist Degrees in Education

Specialist in Counseling and Human Services, Couns.Hum.Serv.Sp.
Specialist in Education, Ed.Sp.
Specialist in Educational Administration, Ed.Admin.Sp.
Specialist in School Psychology, Sch.Psych.Sp.
Specialist in Special Education, Sp.Ed.Sp.
Specialist in Vocational Education, Voc.Ed.Sp.

Professional Degree in Law

Juris Doctor, J.D.

Doctoral Degrees

Doctor of Philosophy, Ph.D.
Doctor of Education, Ed.D.

Programs Offered

Programs offered by the university are shown in the list below. Entries followed by degree abbreviations are major curricula leading to the degrees indicated. After a student has completed the requirements for a degree, the degree name and, if not already a part of the degree name, the major curriculum as shown in this list are printed on the student's diploma. (By contrast, the options listed under some curricula are areas of concentration within the major. Options and academic minors are recorded only on the student's final permanent transcript.) In parentheses after each major curriculum in the list is the college or unit through which the program is offered. The abbreviations used are: Ag, College of Agriculture; A&A, College of Art and Architecture; B&E, College of Business and Economics; Ed, College of Education; Engr, College of Engineering; FWR, College of Forestry, Wildlife and Range Sciences; GS, General Studies Program; Law, College of Law; L&S, College of Letters and Science; Min, College of Mines and Earth Resources. Graduate degrees, except the degree of Juris Doctor, are offered through the College of Graduate Studies. See the note at the end of this list.

Accounting (B&E) B.S.Bus.
Agribusiness (Ag) B.S.Ag.Econ., B.S.An.Sc.
Agricultural Economics (Ag) B.S.Ag.Econ., M.S.
Agricultural Education (Ag) B.S.Ag.Ed., M.S.
Agricultural Engineering (Engr) B.S.Ag.E., M.S., M.Engr., Ph.D.
Agricultural Mechanization (Ag) B.S.Ag.Mech.
Agriculture: General (Ag) B.S.Gen.Ag.
Air Force Officer Education Program, cooperative with Washington State University
American Studies (L&S) B.A.
Animal Physiology (Ag) Ph.D.
Animal Science (Ag) B.S.An.Sc., M.S.
Anthropology (L&S) B.A., B.S., M.A.
Architecture (A&A) B.Arch., M.Arch., M.A.
Army Officer Education Program
Art (A&A) B.F.A., M.A., M.F.A., M.A.T.; also (L&S) B.A.
Art Education (A&A) B.S.Art.Ed.
Bacteriology (Ag) B.S.Bact., M.S., Ph.D., also (L&S) B.S.
Biochemistry (Ag-L&S) M.S., Ph.D.
Biological Sciences (L&S) M.Nat.Sc.
Biology (L&S) B.A., B.S.
Botany (L&S) B.A., B.S., M.S., Ph.D.
Business Education (Ed) B.S.Bus.Ed., M.Ed.
Cartography (Min) B.S.Cart.
Chemical Engineering (Engr) B.S.Ch.E., M.S., M.Engr., Ph.D.
Chemistry (L&S) M.S., M.A.T., Ph.D.
Chemistry: General (L&S) B.S.
Chemistry: Professional (L&S) B.S.
Chemistry: Technical Literature (L&S) B.S.
Chemistry: Technological (L&S) B.Tech.
Child Development and Family Relations (L&S) B.A.; also (Ag) B.S.H.Ec.
Civil Engineering (Engr) B.S.C.E., M.S., M.Engr., Ph.D.
Classical Studies (L&S) B.A.
Clothing, Textiles and Design (Ag) B.S.H.Ec.
Communication (L&S) B.A., B.S.
Computer Engineering (Engr) B.S.Comp.E., M.S., M.Engr.
Computer Science (Engr) B.S.C.S., M.S.
Counseling and Human Services (Ed) M.S., M.Ed., Couns.-Hum.Serv.Sp. Doctoral programs in this field are offered under "Education."
Criminal Justice (L&S) B.S.
Crop Management (Ag) B.S.Pl.Sc.
Crop Science (Ag) B.S.Pl.Sc.
Dance (Ed) B.Dan.
Earth Science (Min) M.A.T.
Economics (B&E) B.S.Bus., M.S.; also (L&S) B.A., B.S.
Education (Ed) Ed.Sp., Ed.D., Ph.D.
Educational Administration (Ed) M.S., M.Ed., Ed.Admin.Sp. Doctoral programs in this field are offered under "Education."
Electrical Engineering (Engr) B.S.E.E., M.S., M.Engr., Ph.D.
Elementary Education (Ed) B.S.Ed., M.S., M.Ed. Doctoral programs in this field are offered under "Education."
Engineering Management (Engr) M.Engr.
English (L&S) B.A., M.A., M.A.T.
English as a Second Language (L&S) M.A.
Entomology (Ag) B.S.Ent., M.S., Ph.D.
Finance (B&E) B.S.Bus.
Fishery Resources (FWR) B.S.Fish.Res., M.S. A doctoral program in this field is offered under "Forestry, Wildlife and Range Sciences."
Food and Nutrition (Ag) B.S.H.Ec.
Food Science (Ag), cooperative with Oregon State University and Washington State University
Foreign Languages (L&S) B.A.
Forest Products (FWR) B.S.For.Prod., M.S., M.F. A doctoral program in this field is offered under "Forestry, Wildlife and Range Sciences."
Forest Resources (FWR) B.S.For.Res., M.S., M.F. A doctoral program in this field is offered under "Forestry, Wildlife and Range Sciences."
Forestry, Wildlife and Range Sciences (FWR) Ph.D.
French (L&S) B.A., M.A.T.
General Studies (GS) B.G.S.
Geography (Min) B.S.Geog., M.S., M.A.T., Ph.D.; also (L&S) B.A., B.S.
Geological Engineering (Min) B.S.Geol.E., M.S.
Geology (Min) B.S.Geol., M.S., Ph.D.
Geophysics (Min) M.S.
German (L&S) B.A., M.A.T.
History (L&S) B.A., B.S., M.A., M.A.T., Ph.D.
Home Economics (Ag) B.S.H.Ec., M.S.
Home Economics Education (Ag) B.S.H.Ec.
Horticultural Science (Ag) B.S.Pl.Sc.
Human Resources Management (B&E) B.S.Bus.
Hydrology (Min) M.S.
Industrial Technology (Ed) B.Tech.
Industrial Technology Education (Ed) B.S.Ed., M.S., M.Ed.
Information Systems (B&E) B.S.Bus.
Interdisciplinary Studies (L&S) B.A., B.S., M.A., M.S. (May also be offered under the B.S.I.S. by colleges other than L&S)
Interior Planning and Design (A&A) B.F.A.
International Studies (L&S) B.A.
Journalism (L&S) B.A., B.S.
Landscape Architecture (A&A) B.L.Arch.
Landscape Horticulture (Ag) B.S.Pl.Sc.
Latin (L&S) B.A.
Latin-American Studies (L&S) B.A.
Law (Law) J.D.
Manufacturing Engineering (Engr) B.S.Mfg.E., M.S., M.Engr.
Marketing (B&E) B.S.Bus.
Marketing Education (Ed) B.S.Bus.Ed.
Mathematics (L&S) B.A., B.S., M.S., M.A.T., Ph.D.
Mathematics: Applied (L&S) B.S.
Mechanical Engineering (Engr) B.S.M.E., M.S., M.Engr., Ph.D.
Medical Education (WAMI), cooperative with University of Washington
Medical Technology (L&S) B.S.
Metallurgical Engineering (Min) B.S.Met.E., M.S.
Metallurgy* (Min) M.S.
Mining Engineering (Min) B.S.Min.E., M.S.
Mining Engineering-Metallurgy (Min) Ph.D.
Music (L&S) M.A., M.Mus.
Music: Applied (L&S) B.A.
Music: Composition (L&S) B.Mus.
Music: History and Literature (L&S) B.A.

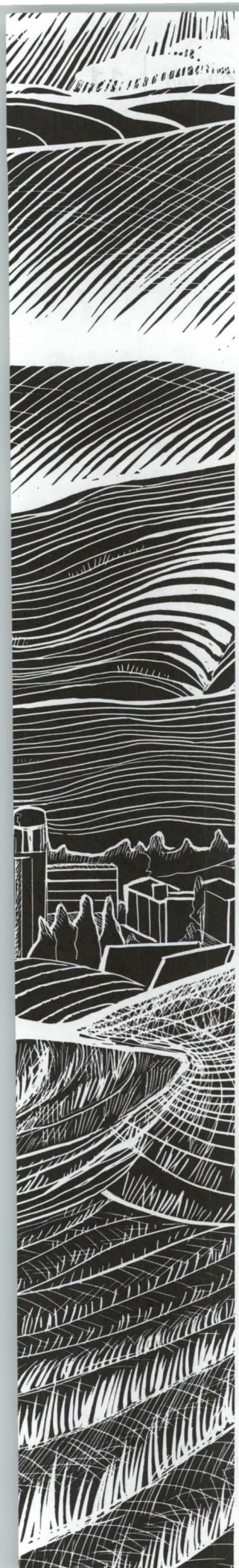
Music: Instrumental Performance (L&S) B.Mus.
Music: Theory (L&S) B.A.
Music: Vocal Performance (L&S) B.Mus.
Music Education: Instrumental (L&S) B.Mus.
Music Education: Vocal (L&S) B.Mus.
Music Education: Vocal-Instrumental (L&S) B.Mus.
Natural Resources and Rural Development (Ag) B.S.Ag.Econ.
Naval Science (L&S) B.N.S.; also Navy-Marine Officer Education Program
Nuclear Engineering* (Engr) M.S., M.Engr., Ph.D.
Office Administration (Ed) B.S.O.Ad.
Office Occupations Education (Ed) B.S.Bus.Ed.
Organizational Communication (L&S) B.A., B.S.
Philosophy (L&S) B.A., B.S.
Photography (A&A) B.F.A.
Physical Education (Ed) B.S.Ed., M.S., M.Ed. Doctoral programs in this field are offered under "Education."
Physics (L&S) B.A., B.S., B.Appl.Phys., M.S., M.A.T., Ph.D.
Plant Protection (Ag) B.S.Pl.Prot.
Plant Science (Ag) M.S., Ph.D.
Political Science (L&S) B.A., B.S., M.A., Ph.D.
Poultry Science (Ag) B.S.An.Sc.
Pre-Nursing Studies (L&S) 2-year program
Production/Operations Management (B&E) B.S.Bus.
Psychology (L&S) B.A., B.S., M.S.
Public Administration (L&S) M.P.A.
Range-Livestock Management (Ag) B.S.An.Sc.
Range Resources (FWR) B.S.Range Res., M.S. A doctoral program in this field is offered under "Forestry, Wildlife and Range Sciences."
Recreation (Ed) B.S.Rec., M.S.
Resource Recreation and Tourism (FWR) B.S.Res.Rc., M.S., M.F. A doctoral program in this field is offered under "Forestry, Wildlife and Range Sciences."
School Psychology (Ed) Sch.Psych.Sp.
Secondary Education (Ed) B.S.Ed., M.S., M.Ed. Doctoral programs in this field are offered under "Education."
Sociology (L&S) B.A., B.S.
Soil Science (Ag) B.S.Soil Sc., M.S., Ph.D.
Spanish (L&S) B.A., M.A.T.
Special Education (Ed) B.S.Ed., M.S., M.Ed., Sp.Ed.Sp. Doctoral programs in this field are offered under "Education."
Sport Science (Ed) B.S.P.E.
Statistics (L&S) M.S.
Theatre Arts (L&S) B.A., B.S., B.F.A., M.F.A.
Trade and Industrial/Technical Education (Ed) B.S.Ed.
Veterinary Science (Ag) B.S.Vet.Sc., M.S.; also Veterinary Medicine, cooperative with Washington State University and Oregon State University.
Visual Communication (L&S) B.A., B.S.
Vocational Education (Ed) M.S., M.Ed., Voc.Ed.Sp. Doctoral programs in this field are offered under "Education."
Wildlife Resources (FWR) B.S.Wildl.Res., M.S. A doctoral program in this field is offered under "Forestry, Wildlife and Range Sciences."
Zoology (L&S) B.A., B.S., M.S., Ph.D.

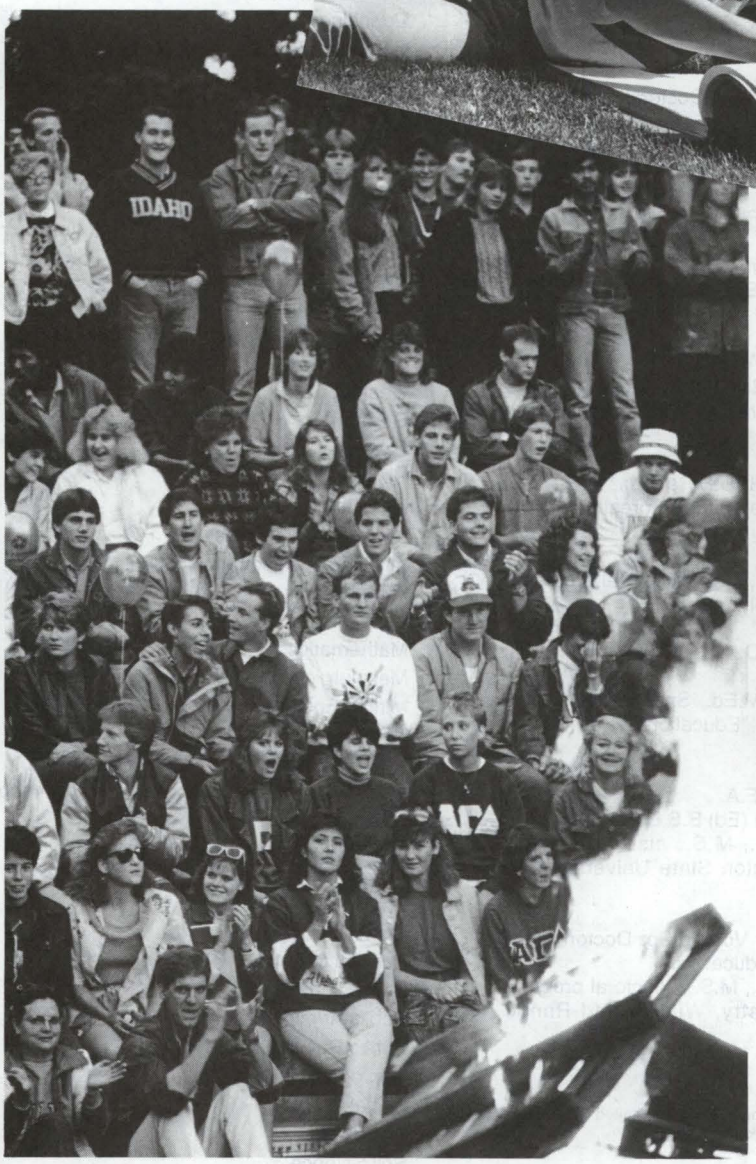
*The graduate majors in metallurgy and nuclear engineering are limited to students enrolled in the UI/Idaho Falls Center for Higher Education.

Academic Minors Offered

A student may elect to pursue one or more of the academic minors listed below. See regulation J-9 in part 3.

Advertising
Agribusiness
Agricultural Economics
Agricultural Extension Education
Agricultural Mechanization
American Government/Public Law
American Studies
Anthropology
Art
Athletic Training
Bacteriology
Biochemistry
Biology
Botany
Chemistry
Classical Studies
Coaching
Computer Science
Criminal Justice
Crop Science
Dance
Economics
English
English as a Second Language
Entomology
Foreign and International Politics
Forest Products
Forestry, Wildlife and Range Sciences
French
Geology
German
Greek
History
Horticulture
International Studies
Interpersonal Communication
Journalism
Latin
Mathematics
Metallurgical Engineering
Mining Engineering
Music
Natural Resource Communication
Natural Resource Economics and Community Development
Naval Science
Outdoor Recreation Leadership
Philosophy
Physics
Plant Protection
Political Science
Psychology
Public Administration
Public Relations
Recreation
Social Work
Sociology
Soil Science
Spanish
Statistics
Technical Theatre
Theatre Arts
Theatre Arts Performance
Therapeutic Recreation
Tourism and Leisure Enterprises
Visual Communication
Wilderness and Nature Conservation
Zoology





Admission to the University

Students desiring to enter the university for the first time should write to the Admissions Office to request an admission application. They will receive applications for admission, scholarships, and financial aid and a means of requesting information on housing and various student activities.

This catalog section contains general information pertinent to all applicants for admission to the university. See "Admission of International Students" and "Admission to the College of Graduate Studies and the College of Law," near the end of this catalog section, for additional information.

Students who are pursuing a baccalaureate degree are classified as undergraduates: freshmen (fewer than 26 credits), sophomores (fewer than 58 credits), juniors (fewer than 90 credits), or seniors.

Applicants who are still in high school should apply during the first semester of their senior year and should ask the school to send a record of their first seven semesters to the Admissions Office. If otherwise qualified, the applicant will be given an early notice of tentative acceptance for fall entrance based on this record. Final acceptance will be granted when the university receives confirmation that the applicant has graduated from an accredited high school and has satisfied all admission requirements.

Admission Procedures

Credentials. Applicants for admission are required to submit:

1. Personal data on the regular "Application for Admission" form. Failure to list all institutions attended as specified on the application form is considered fraud and subjects the applicant to immediate cancellation of his or her registration.

2. An official transcript from the last high school attended and an official transcript from each institution attended beyond high school. TRANSCRIPTS SUBMITTED IN SUPPORT OF AN APPLICATION MUST BE OFFICIAL AND MUST BE SENT DIRECTLY TO THE ADMISSIONS OFFICE BY THE ISSUING INSTITUTION (or certifying agency in the case of international students). TRANSCRIPTS WILL NOT BE ACCEPTED FROM THE APPLICANT, BECOME THE PROPERTY OF THE UNIVERSITY, AND CANNOT BE RETURNED, COPIED, OR FORWARDED. Official transcripts must be signed by the registrar, superintendent, principal, or other authorized official of the school.

3. Each applicant for admission to the freshman class (including transfer students with fewer than 14 semester credits) is required to have the scores attained on the College Entrance Examination Board (SAT) or the American College Testing Program (ACT) or the Washington Pre-college Test (SAT Conversions) sent to the Admissions Office before registration.

Application Fee. With certain exceptions, **new** applications for admission must be accompanied by a $20 nonrefundable application fee. This fee is not charged to students applying for nondegree programs.

Final Dates for Application. To provide time for evaluation and for notice of acceptance to reach the applicant before registration, applications and credentials should be received by the Admissions Office by August 1 for fall-semester entrance and by December 15 for spring-semester entrance (see "Admission of International Students" for final dates of application by those students). Applications and credentials for summer session should be received by the Admissions Office at least three weeks before the opening date of the summer session or the program in which the student intends to enroll. Applications received after the above dates will be accepted in the order of their receipt only as long as additional new students can be accommodated. Acceptance will be subject to space limitations in the division in which the applicant wishes to register.

Acceptance.

1. When an applicant's credentials have all been received and he or she has been found eligible, a letter of final acceptance and information on current costs and registration procedures will be sent.

2. Acceptance is granted for a specified semester or summer session. If an applicant does not register for the term for which he or she applied and was accepted, it will be necessary to submit a supplemental application if entrance at a later time is desired.

Admission Requirements

Applicants for admission to the university must present satisfactory evidence of good character.

Regular Admission

A degree-seeking student with fewer than 14 credits of college work must:

1. Submit scores received on the ACT or SAT before enrollment.

2. Have graduated from an accredited high school in the upper three-fourths of his or her graduating class OR have an Enhanced ACT composite score of 19 OR an SAT Verbal and Math combined score of 830. An ACT composite score of 16 is acceptable if earned before October 1989.

3. Have completed with at least a 2.00 grade-point average the courses listed below. A credit is defined as a course taken with a minimum of 70 hours of classroom instruction. (Applicants who graduated from high school before 1989 are exempt from these requirements but must meet those in the 1988-89 General Catalog.)

a. **English:** A minimum of 8 credits, selected from composition and literature courses.

b. **Mathematics:** A minimum of 4 credits with 6 credits strongly recommended, including algebra I and geometry, or algebra I and II. Other courses may be selected from analytic geometry, calculus, statistics, and trigonometry. [Beginning fall semester 1991, the mathematics requirement will be a minimum of 6 credits including algebra I, geometry, and another course that has algebra I as a prerequisite. Other courses may be selected from algebra II, analytic geometry, calculus, statistics, and trigonometry. Two years of mathematics credit must be taken in the 10th, 11th, or 12th grades.]

c. **Social Science:** A minimum of 5 credits, selected from American government (state and local), geography, U.S. history, and world history. Other courses may be selected from economics (including consumer economics if it has the components recommended by the State Department of Education), psychology, and sociology.

d. **Natural Science:** A minimum of 4 credits with 6 credits strongly recommended, selected from anatomy, biology, chemistry, earth science, geology, physical science, physics, physiology, and zoology. Must include laboratory science experience in at least 2 credits (a laboratory science course is defined as one in which at least one class period each week is devoted to providing students with the opportunity to manipulate equipment, materials, or specimens; to develop skills in observation and analysis; and to discover, demonstrate, illustrate, or test scientific principles or concepts). [Beginning fall semester 1991, the natural science requirement will be a minimum of 6 credits.]

e. **Fine Arts, Foreign Language, or Humanities:** A minimum of 4 credits, selected from literature, history, philosophy, foreign language, and related study of two or more of the traditional humanities disciplines. History courses beyond those specifically required for graduation may be counted toward this requirement. May include not more than two credits of studio or performing classes in art, dance, drama, and music (if they have components as recommended by the State Department of Education,

i.e., theory, performance, history, and appreciation evaluation). Practical arts courses will not be counted toward this requirement. Practical arts are defined as vocational, prevocational, or consumer homemaking programs approved by the State Board of Education, including courses in agricultural education, business education, health occupations education, consumer homemaking education, home economics occupational education, industrial technology education, vocational marketing education, multi-occupations education, and trade, industrial, and technical education.

f. **Speech:** A minimum of 1 credit in a speech activity or performance course. Debate, if taught for credit by a certified teacher, may be counted toward this requirement.

Provisional Admission

A degree-seeking student who does not qualify for regular admission but satisfies one of the criteria below may petition the director of admissions for admission as a provisional student.

1. Has graduated from high school and has a predicted college grade-point average of at least 2.00 based on ACT or SAT scores.

2. Has a General Educational Development (GED) Test certificate, is at least 19 years of age, and has a predicted college grade-point average of at least 2.00 based on ACT or SAT scores.

3. Deserves special consideration because of delayed entry or by virtue of being a disadvantaged or minority student, returning veteran, or talented student desiring to enter college early, or other relevant factors.

Such applicants must submit, with the admission application, three letters of evaluation from counselors, teachers, or other educational authorities who can attest to the applicant's academic potential. If admitted, the student may be required to attend pre-academic planning within an office or program to be specified in the letter of acceptance.

Applicants for provisional enrollment must submit scores received on the ACT or SAT before enrolling.

If admitted, the student will be enrolled with provisional standing and will be subject to the regulations on academic probation, disqualification, and reinstatement (see regulation L in part 3) with the following additional provisions: the student's provisional standing will be changed to regular standing upon satisfactory completion of 14 credits, 12 of which must be in four different subject areas of the general education requirements (see regulation J-3); if the student has not attained regular standing after being enrolled for three terms, he or she will be dismissed, subject to institutional committee appeal procedures.

Preparation Recommended by UI Colleges

Certain preparation in addition to the minimum requirements set forth above is advisable if a student is to enter easily and progress smoothly through a particular university curriculum. The following table indicates the high school preparation recommended for pro-

PREPARATION RECOMMENDED BY COLLEGES

Subject Areas

Number of Credits Recommended by College

Students who plan to enter the General Studies Program (see part 4) should use this chart as a guide for minimum high school preparation

	Agriculture	Art & Architecture	Business & Economics	Education	Engineering	Forestry, Wildlife & Range Sciences	Letters & Science	Mines & Earth Resources
English	8	8	8	8	8	8	8	8
Mathematics[1]								
Algebra	2	2	2	2	2	2	2	2
Geometry	2	2[2]	2	2	2	2	2[2]	2
Advanced Algebra	1		2		2	2		1
Trigonometry					1	1		
Other					1			1[2]
Social Science	5	5	5	5	5	5	5	5
Natural Science[4]								
Biology						2		
Chemistry					2	2		
Physics					2	2		2[2]
Unspecified	4	4	4	4	2		4	2[2]
Fine Arts, Foreign Language or Humanities	4	4	4	4	4	4	4	4
Speech	1	1	1	1	1	1	1	1
Total academic credits	27	26	28	26	32	31	26	28
Additional academic, vocational, or elective units	3	4	2	4			4	2
Total credits	30	30	30	30	32	31	30	30

[1]Beginning with the fall semester 1991, the minimum for any college will be a total of 6 credits in mathematics.
[2]Or advanced algebra. Both geometry and advanced algebra are recommended, especially for prospective students of mathematics, science, or architecture.
[3]Either advanced algebra, trigonometry, or solid geometry (in this order of preference).
[4]Must have laboratory experience in at least 2 credits. Beginning with the fall semester 1991, the minimum for any college will be a total of 6 credits in natural science.
[5]For mining, metallurgical, or geological engineering; for geography the 4 credits are unspecified.
[6]Chemistry strongly recommended.

spective majors in the respective curricula of each of the UI colleges (the table combines the minimum requirements and the recommended supplements). This tabulation should help an applicant determine whether his or her preparation is adequate for a given field of study and assist students and their advisers in planning their high school programs.

Students may be admitted with fewer academic credits than the minimum total indicated for their particular college or they may be admitted with the total academic units required but with fewer units than indicated in one or more subjects. In either case the student's college will identify subject inadequacies and prescribe the means by which these deficiencies are to be removed or satisfied. Courses needed as preparation for the student's college curriculum should be taken during the student's first year at the university.

Advanced Placement. Credit is granted for successful completion of the CEEB Advanced Placement Examination, the College Level Examination Program (CLEP), and courses at military schools as recommended by the American Council on Education. Inquiries about other forms of advanced placement and requests for evaluation of advanced-placement credits or for guidelines to avoid duplication of credit should be addressed to the Admissions Office.

Applicants with Previous College Credit.

1. Applicants who have been enrolled in other colleges or universities accredited by one of the regional agencies, such as the Northwest Association of Schools and Colleges, and whose scholastic records at these institutions are satisfactory may be admitted to advanced standing. These students must submit the following credentials to the Admissions Office of the University of Idaho at least one month before they expect to enter the university: a transcript from the last high school attended and separate transcripts from each of the higher institutions attended. TRANSCRIPTS SUBMITTED IN SUPPORT OF AN APPLICATION MUST BE OFFICIAL AND MUST BE SENT DIRECTLY TO THE ADMISSIONS OFFICE BY THE ISSUING INSTITUTIONS (or certifying agency in the case of international students). TRANSCRIPTS WILL NOT BE ACCEPTED FROM THE APPLICANT, BECOME THE PROPERTY OF THE UNIVERSITY, AND CANNOT BE RETURNED, COPIED, OR FORWARDED.

2. Upon admission of a transfer student, all credits earned or attempted and all grades received in college-level courses at accredited institutions are evaluated and core-curriculum determinations are made by the Admissions Office (see item 9 below). The applicability of these credits to the student's program of study is determined by the student's major department. No grade points for this work are included in the computation of his or her grade-point average at the University of Idaho. Transfer credit from non-U.S. institutions is recorded with grades of pass or fail only. All transfer credits are recorded on the student's permanent record after he or she is officially registered.

3. Students admitted to the University of Idaho from other collegiate educational institutions must have complied with the academic regulations for continuance in the institution(s) that they have attended in addition to the academic regulations that are applied to students enrolled in this institution.

4. Internal advanced-placement credit granted by other accredited institutions will be honored on transfer to the University of Idaho.

5. Transfer students are selected from those applicants who present a cumulative grade-point average of at least 2.00 (C) for all college-level study attempted in all accredited colleges attended, exclusive of courses for which grade points are not allowed. Students transferring from out-of-state schools into the College of Engineering must have a cumulative grade-point average of at least 2.80.

6. Transfer applicants with fewer than 14 semester hours of transfer credit must meet both beginning freshman and advanced-standing admission requirements, including submission of the required test scores. (See "Regular Admission," above.)

7. The university may grant credit for completion of certain educational programs sponsored by the armed forces. In evaluating these programs, consideration will be given to recommendations made by the American Council on Education and other appropriate agencies and to university degree requirements.

8. A maximum of 70 credits earned at junior or community colleges, or one-half of the total credits required for the student's intended baccalaureate degree program, whichever is the higher number, may be transferred to the University of Idaho.

9. One of the requirements for a UI baccalaureate degree is fulfillment of the general-education or "core-curriculum" requirement. Students who enter UI with transfer credit have two options for fulfilling this requirement. One option is to satisfy the requirement as outlined in regulation J-3 in part 3 of this catalog. In this case, transfer credits are evaluated on a course-by-course basis for equivalency to courses specified in J-3, and deficiencies are made up by completing the necessary additional credits in nonduplicating courses listed in J-3. As an alternative, a transfer student may satisfy the general-education requirements established by the State Board of Education as set forth immediately below. In this case, transfer credits are evaluated by category, rather than on a course-by-course basis, and deficiencies are made up by completing the necessary additional credits in nonduplicating courses listed in J-3.

Alternative General-Education Requirements for Transfer Students

A total of at least 36 credits that fit within the following categories and credit ranges must be completed.

a. **Communications:** 1 course (2-3 credits). Courses in this area enhance the student's ability to communicate clearly, correctly, logically, and persuasively in spoken English. Disciplines—debate, rhetoric, and speech.

b. **English Composition:** 1-2 courses (3-6 credits, depending on initial placement results). To satisfy this category, students must be able to express themselves in clear, logical, and grammatically correct written English. The first three credits may be exempt by ACT, SAT, WPCT, CLEP, or CEEB AP exam.

c. **Behavioral and Social Science:** 2-4 courses (6-12 credits). Courses in this area provide instruction in the history and culture of civilization; the ways political and economic organizations, structures, and institutions function and influence thought and behavior; and the scientific method as it applies to social science research. Disciplines—anthropology, economics, geography, history, political science, psychology, and sociology. Courses must be distributed over two different disciplines.

d. **Humanities, Fine Arts, and Foreign Language:** 2-4 courses (6-12 credits). Courses in this area provide instruction in the creative process, history and aesthetic principles of the fine arts, philosophy and the arts as media for exploring the human condition and examining values, and communication skills in a foreign language. Disciplines—art, drama-theatre, foreign languages, literature, music, and philosophy.

e. **Natural Science:** 2 courses (7-12 credits). Courses in this area provide an understanding of how the biological and physical sciences explain the natural world and introduce the basic concepts and terminology of the natural sciences. Disciplines—biology, chemistry, geology, physical geography, and physics. Courses may be distributed over two different disciplines; at least one course must have had an accompanying laboratory experience.

f. **Mathematics:** 1 course (3-5 credits). Courses in this area are intended to develop logical reasoning processes; skills in the use of space, numbers, symbols, and formulas; and the ability to apply mathematical skills to solve problems. Courses may

include college algebra, calculus, finite mathematics, and statistics.

Applicants with Vocational-Technical Credit. Credits earned in vocational-technical courses at accredited or state-approved vocational-technical schools may be the basis for waiving requirements or transferring credits to the University of Idaho in accordance with the following regulations:

1. When equivalence has been validated by the academic department and college that offer comparable subject matter, credits may be transferred as unspecified credits in the appropriate discipline (for example, a block of credits in agriculture) or for specific lower-division courses taken at the other institution.

2. In those cases in which comparable subject matter is not taught at the University of Idaho, the amount and characterization of the credits to be transferred is determined by the department and the dean of the college into which the student is transferring.

3. A grade of P (pass) is recorded for such credits that are transferred.

4. Credits transferred from vocational-technical schools are included within the 48-credit limitation of extramural and similar credits that may be counted toward a baccalaureate degree (see regulation J-5-b).

5. The department into which the student transfers decides what curricular requirements, if any, will be waived (this determination may be made independently of the transfer of credits).

6. If there are any questions concerning the waiving of distributional requirements in the college into which the student transfers, such questions are to be resolved by the dean of that college.

7. Except as substitutions for equivalent courses offered by the student's academic department, no credits in vocational-technical courses taken at a vocational-technical school may be counted toward the minimum of 128 credits required for a liberal arts degree (i.e., B.A. or B.S.) in the College of Letters and Science.

Admission as a Nonmatriculated Student. This category is for applicants who wish to pursue studies for their personal edification and who do not want to work toward a formal degree at the University of Idaho. Transcripts must be received by the Admissions Office directly from the issuing institutions.

As admission to this category is not automatic, a transcript from the last accredited institution attended and additional documentation may be required to ensure the applicant meets minimum university admission requirements for freshmen or transfer students, as applicable.

If a student wishes to change to a degree program, he or she will be required to file a regular application for admission and meet regular admission requirements. The department in which the student plans to major determines how much of the credit earned while a nonmatriculated student will be counted toward the degree. Degree requirements are those listed in the catalog in effect at the time of enrollment in the University of Idaho as a degree-seeking student.

The student is responsible for ascertaining the applicability of credit earned while registered in this category. Permission of the dean of the Graduate College and the instructor is required to enroll in courses numbered 500-600. Permission of the dean of the College of Law is required to enroll in courses numbered 800-999. All students in the nonmatriculated category who register for a full course load (i.e., 12 or more credits in any semester or six or more credits in a summer session) will be disqualified if a 2.00 GPA is not earned during that semester or summer session. Nonmatriculated students who are disqualified are ineligible to continue in the university unless readmitted.

Students admitted to the nonmatriculated category at the University of Idaho are not eligible to receive federal Title IV financial aid.

A nonmatriculated student who has registered for 12 credits or more for each of two semesters is required to petition the Admissions Committee if he or she wishes to continue as a nonmatriculated student enrolled for 12 credits or more. Such a student will be required to file the same credentials as required of a regular student.

A nonmatriculated applicant must complete a special application form indicating an understanding of the limitations of this category.

Registration as a nonmatriculated student does not meet the Immigration Service requirements for the issuance of a visa.

Admission of International Students. The University of Idaho accepts qualified students from other countries to the extent that they can be accommodated. International students are selected for admission to the university from among applicants whose previous academic records meet the minimum levels stated in 3 below.

1. **Credentials.** Official transcripts or certified copies of the certificate, diploma, or government examination report received from any college or university must be translated into English and MUST BE SENT BY THE CERTIFYING AGENCY DIRECTLY TO THE ADMISSIONS OFFICE.

2. **Final Dates for Applications.** To provide time for evaluation, for notice of admission status to reach the applicant, and for INS requirements to be met for issuance of a student visa, applications and credentials should be received by the Admissions Office no later than the applicable date shown below:

   a. From applicants who are currently residing outside the U.S.—for fall semester, April 15; for spring semester, September 15; for summer session, March 15.

   b. From applicants who are currently residing in the U.S.—for fall semester, June 15; for spring semester, December 1; for summer session, May 1.

3. **Grade-Point Average.**

   a. Applicants who have had no previous work at the college level must have at least a high "C" average.

   b. Applicants for admission as undergraduate students who have attended a college-level institution must have completed at least one year of full-time study at an accredited college or university and must present a minimum grade-point average of 2.80 for all baccalaureate-level work attempted.

   c. Applicants for admission as graduate students are expected to have qualifications similar to those required of other graduate students, including at least a 2.80 cumulative grade-point average (or its equivalent on a different grading scale).

4. **English Proficiency.** All applicants for whom English is not the native language must present the minimum score on the Test of English as a Foreign Language (TOEFL) prescribed by the academic unit in which they plan to study, with the exception of those from English-speaking countries and those who have earned a degree from either a U.S. institution or an institution in another English-speaking country. Written permission from the director of admissions must be obtained to substitute the results of another examination for TOEFL. Those transferring with a minimum of one year of full-time baccalaureate study will be evaluated individually by the Admissions Office and the appropriate department to determine whether English proficiency has been demonstrated or the TOEFL is to be required.

5. **Financial Statement.** International students must present to the Admissions Office satisfactory statements of finances and adequate proof of financial responsibility or sponsorship by a reputable American citizen or organization for all financial obligations while attending the university.

6. **Health and Accident Insurance.** International students must either purchase optional health and extended accident insurance or document coverage by equivalent insurance as part of their obligation to establish proof of financial responsibility for expenses incurred while attending the university. See information on insurance below.

Admission to the College of Graduate Studies and the College of Law. Students interested in graduate study should request a copy of the Graduate Bulletin. The special procedures for admission to the College of Law are described in part 4.

Mutual Responsibility Agreement

UI's acceptance of a student for admission and the student's enrollment in the university constitute an agreement of mutual responsibility. The student's part of this agreement is to accept established UI policies and rules, to respect the laws of governmental units, and to act responsibly and in a manner appropriate to these laws, policies, and rules. UI's part is to carry out its commitment to higher education, to fulfill its responsibilities in pursuit of the academic goals and objectives of all members of the university community, and to meet its obligation to provide an atmosphere in which students will have an opportunity to be heard in matters affecting their welfare as students. UI must take appropriate disciplinary action when it has been ascertained that a student's action is contrary to UI regulations and thus that this agreement has been violated.

Fees and Expenses

The rates quoted in this section were in effect during the 1990-91 academic year. They are subject to change without notice.

Expenses for attending the University of Idaho vary with the taste and financial means of each student. The university takes pride in its record of providing high-quality instruction at reasonable cost.

Board and room are available at relatively low rates under a variety of plans. Single-occupancy rooms are subject to availability of space and cost more each semester than double-occupancy rooms. Students may reduce their living costs by sharing the work in the cooperative residence halls.

Annual Expenses

In forecasting total costs for the academic year, double the 1990-91 semester costs, allow for normal increases, and add miscellaneous costs—clothing, laundry, transportation, incidentals, social and recreational expenditures, fraternal affiliations, and personal needs.

An undergraduate student coming to the university needs about $1,550 to meet initial payments. Out-of-state students need an additional $1,170 to cover tuition. Personal checks, bank drafts, money orders, or travelers checks are all accepted by the university. Also see "Deferred Payment of Fees" further on in this catalog section.

1990-91 Costs per Semester

	Idaho Residents	Nonresidents
Tuition[1]	0	1,170
Regular full-time student fees	583	583
Books, supplies, etc	265	265
Room and board[2]	1,337	1,337
TOTAL[3]	$2,185	$3,355

[1] In addition to special fees applicable to students enrolled in the College of Graduate Studies, the College of Law, etc.
[2] Double-occupancy rate in university-owned residence halls with 14 meals per week. Cooperative dormitories in which residents provide their own janitorial and dining hall services are available at a lower cost.
[3] Not including personal, incidental, or travel expenses.

Regular Student Fees

Unless exempted, students carrying eight or more credits (or equivalent) and all graduate/instructional assistants (including faculty-staff spouses) on full appointment pay the full-time student fees applicable to the particular division in which the student enrolls. Students in all divisions pay $583 a semester. Students in certain divisions pay additional amounts; see "Special Fees" below. Fees are payable in full at the time of registration during the scheduled registration period. Also see "Deferred Payment of Fees," below.

Payment of full-time fees covers most laboratory and course charges and entitles the student to membership in the Associated Students University of Idaho (ASUI), to a nontransferable student identification card, to the services of the Alumni Office, and to the other services and facilities maintained by the university for the benefit of the students, subject to charges for special services and the payment of the special fees listed below. No reduction in fees can be made for students who may not want to use any part of these services.

Special Fees

Nonresident Tuition ($1,170 per semester). Students who are classified as nonresidents of the state of Idaho pay this special fee in addition to the regular student fees. For tuition purposes, a student who is a permanent resident of the U.S. may be classified as a resident of Idaho by meeting one or more of the following qualifications:

1. Any student who has one or more parent or parents or court-appointed guardians who are domiciled in the state of Idaho. Domicile, in the case of a parent or guardian, means that individual's true, fixed, and permanent home and place of habitation. It is the place where that individual intends to remain, and to which that individual expects to return when that individual leaves without intending to establish a new domicile elsewhere. To qualify under this section, the parent, parents, or guardian must be residing in the state on the opening day of the term for which the student matriculates.

2. Any student who receives less than 50 percent of the student's support from a parent, parents, or legal guardians who are not residents of this state for voting purposes but which student has continuously resided in the state of Idaho for 12 months next preceding the opening day of the period of instruction during which the student proposes to attend the university.

3. Any student who is a graduate of an accredited secondary school in the state of Idaho and who matriculates at a college or university in the state of Idaho during the term immediately following such graduation regardless of the residency of the student's parent or guardian.

4. The spouse of a person who is classified, or is eligible for classification, as a resident of the state of Idaho for the purpose of attending a college or university.

5. A member of the armed forces of the United States, stationed in the state of Idaho on military orders.

6. A student whose parent or guardian is a member of the armed forces and stationed in the state of Idaho on military orders and who receives 50 percent or more of support from parents or legal guardians. The student, while in continuous attendance, shall not lose that residency when the student's parent or guardian is transferred on military orders.

7. A person separated under honorable conditions from the United States armed forces after at least two years of service, who at the time of separation designates the state of Idaho as their intended domicile or who has Idaho as the home of record in service and enters a college or university in the state of Idaho within one year of the date of separation. (A copy of the DD-214 Separation Papers must be submitted in support of this qualification.)

8. Any individual who has been domiciled in the state of Idaho, has qualified and would otherwise be qualified under the provisions of this statute, and who is away from the state for a period of less than one calendar year and has not established legal residence elsewhere provided a 12 month period of continuous residence has been established immediately prior to departure.

For students who apply for special graduate and professional programs including, but not limited to, the WAMI (Washington, Alaska, Montana, Idaho) Regional Medical Program, the WICHE Student Exchange Programs, Creighton University School of Dental Science, and the University of Utah College of Medicine, and the Washington, Oregon, Idaho (WOI) Regional Program in Veterinary Medical Education, additional residency requirements shall be in force. No applicant shall be certified or otherwise designated as a beneficiary of such special program who has not been a resident of the state of Idaho for at least one calendar year previous to the application date.

Additional information and interpretation of the residency regulations may be obtained from the Admissions Office.

Application Fee. For information concerning the application fee, see the section headed "Admission Procedures" at the beginning of part 2 of the catalog.

Registration Packet Replacement Fee ($5).

Law Tuition ($188 a semester). Students who enroll in the College of Law pay this fee in addition to the regular student fees and, if applicable, in addition to nonresident tuition. Part-time fees are $18 per credit.

Graduate Tuition. Students who enroll in the College of Graduate Studies pay this fee in addition to the regular student fees and, if applicable, in addition to nonresident tuition. Fees are $188 per semester for full-time students or $18 per credit for part-time students. Undergraduate and nonmatriculated students enrolling in graduate courses must also pay the appropriate graduate fee.

WUE Fee. The Western Undergraduate Exchange Program has an additional fee that is equal to 50 percent of the institution's matriculation fee, facility fee, and activity fee. These fees currently total $583, therefore the WUE fee is $291.50. This fee is in addition to the regular student fees of $583; nonresident tuition is not assessed WUE students.

WAMI Tuition. First-year students who enroll in the WAMI Medical Education Program pay this fee in addition to the regular student fees of $583. For 1990-91, the UI fee is $2,342 and the University of Washington fee is $75. The total fee per semester is $3,000.

Registration Fee for Senior Scholars. Persons 60 years of age and older are permitted to enroll in courses on the Moscow campus, on a space-available basis. The fee is $20 plus $5 per credit. Senior scholars are enrolled after the regular registration days. Special fees for specific courses, e.g., music lessons, are assessed, if such charges are made to other students who take the courses concerned. Registration under this program entitles the student to instruction and library privileges only, and does not include insurance, student health services, ASUI membership, or free admission to athletic events.

Part-Time Fee ($62.50 a credit or equivalent). Students who register for seven credits or less pay this fee and any special fees applicable to specific courses in lieu of regular fees and tuition. Graduate and law students pay an additional $18 a credit.

Audit or Zero-Credit Fee ($62.50 a credit or equivalent). Students who register as auditors or for zero credit pay this fee and any special fees applicable to specific courses unless the registration is part of a normal registration for a specific semester or other academic session for which the student has already paid the full registration fees.

Late Registration Fee ($50). Students who are allowed to register after the last day to add classes or change course sections pay this fee (see regulation C in part 3). They also pay the $5 petition fee when applicable (see below).

Drop/Add Fee ($5). A $5 fee is charged each time a request is filed to drop or add one or more courses after the tenth day of classes.

Petition Fee ($5). A $5 fee is charged for each petition submitted to the Academic Petitions Committee or Graduate Council.

Video Outreach Program. Fees are $242 per credit for students who have applied for admission to or have been admitted to the Graduate College or who register for 500-level courses. Students taking courses at the 400 level or lower and who are registered in nonmatriculated status pay $225 per credit. A video delivery fee of $27 per credit is also charged. Tapes must be viewed at the University Centers or on the campus cable system. Courses and shortcourses that have been videotaped may be rented or purchased. Typical rental fees are $50 for a one-hour videotape or about $2,100 for a three-credit course. For additional information, contact the Engineering Outreach Office.

Student Health Service Fees. Payment of student registration fees entitles a student to the basic services of the Student Health Service. Additional fees are charged for medications, certain studies, and additional services according to rates maintained and available at the clinic.

Music Special Fees. All students, including graduate-student appointees, enrolling in courses numbered MusA 114, 124, 134, 314, 324, 334, 514, 524, 534, and MusC 507, Individual Instruction, pay $100 for each credit or equivalent. (The individual-instruction fee may be waived for students whose programs of studies specifically require these courses for graduation.) In addition, each student presenting a formal recital performance in the Hampton School of Music Recital Hall is charged $35. If two or more performers present a program together, the $35 fee may be shared by the performers. A $10 fee is charged all students who are enrolled in MusH 101, 321, 322, and 323. The fee provides two tickets to the Auditorium Chamber Music Series. In addition, a $15 use fee is charged all students who are enrolled in MusA 145, 146, 245, and 246 (Piano Class) and MusC 426 (Electronic Music).

Departmental Special Fees. Special fees are charged for certain courses. Examples include the College of Art and Architecture that charges a general shop fee and/or fee for certain courses and the College of Education that charges special fees for physical education classes. Consult departmental offices for the current schedule of departmental special fees.

Advanced Standing Exam Fee ($20). Charged for each separate request or petition for extramural credit—except credit for external study/experience (see below)—that is processed subsequent to a student's initial enrollment in the university. This fee applies without regard to the number of credits sought, requested, or granted. Examples of "extramural credit" are: credit by examination (see regulation D-4); credit for technical competence under such catalog entries as VocEd 270, 370, 470, and 480; and credit for bypassed courses (see regulation I).

External Study/Experience Fee ($15 for filing and $10 for each credit granted). The filing fee is charged at the time the student initiates formal action to have his or her work evaluated for the granting of credit for external study/experience (see regulation I-5). The per-credit fee is charged at the time the credit is granted.

Diploma Fee ($10). This fee is payable at the time the student applies for each degree to be awarded by the university. An additional fee of $5 is charged for a special diploma insert.

Thesis/Dissertation Binding Fee ($16). At the time the application for the degree is filed, every candidate for an advanced degree who is submitting a thesis or dissertation (including such terminal projects as musical compositions) pays this fee to have two copies of the document bound.

Publication and Microfilming Fee ($50). Candidates for the Ph.D. or Ed.D. degree pay this fee for the publication of the dissertation abstract and for the microfilming of the dissertation.

Transcript Fee ($2). Every person who has established an academic record at the university (including continuing education and correspondence study) is furnished, upon request, one official copy of the academic record without charge. Additional copies, when requested, are $2 per copy.

Yearbook Fee ($19). Students wishing to order a copy of the *Gem of the Mountains* pay this fee at the time the order is placed.

Miscellaneous Fees.

1. For library charges, consult the University Library.

2. For costs of field trips and special equipment for certain courses, consult the instructor.

3. A greens fee is charged for the use of the Golf Course.

4. University employees and students are charged fees to park in university-owned lots.

Deferred Payment of Fees

Students who have no delinquent accounts with the university and who are assessed registration fees or tuition in excess of $100 are eligible to defer payment of part of the fees and tuition in accordance with the following regulations:

1. At least 40 percent of fees and tuition, in addition to the service charge specified below, must be paid at the time of registration.

2. Any special fees must be paid at the time of registration including deposits, special course fees, insurance, fines, penalties, special workshop fees, and other special charges or fees.

3. Service charges for the deferred payment plan are based upon the amount deferred as follows:

Amount Deferred	Service Charge
to $100	$ 5
$101-$300	$10
$301-$500	$15
$501-$800	$20
over $800	$25

This charge is nonrefundable and must be paid at the time of registration.

4. The deferred balance is payable in two equal installments which are due approximately four weeks and eight weeks into the semester.

5. Any delinquent installments are assessed an additional $8 late charge, and the registration of the student concerned is subject to cancellation. **If the terms of deferral are not fulfilled, the student loses the right to defer in the future.**

6. Any aid received by a student for purposes of registration (scholarships, student loans, awards, etc.) must be applied toward the registration fees. If any aid funds remain, they are available for room, board, and books. If any fees remain, 40 percent must be paid by the student and the remaining balance paid in equal installments as noted above.

7. For students who wish to defer their registration fees, a separate table is set up in the Kibbie-ASUI Activity Center during registration. Students can check at this table if they can defer and, if so, a promissory note will be drawn up and signed.

8. In the event a student who owes deferred payments withdraws from school, the difference between the portion of charges that would normally be refundable, if any, and the amount paid on the deferred plan becomes immediately due and payable in full.

Refund of Fees

Students who withdraw in accordance with the regulations governing withdrawals are entitled to the following refund of fees (except that for full-time students $11 of the registration fee is nonrefundable once registration is completed; $5 for part-time students). This does not apply, however, to the Northwest Interinstitutional Council on Study Abroad (NICSA) program; once the overseas program has begun, no refunds are possible.

1. When withdrawal is accomplished on or before the registration day and before the published date classes begin, fees (less $11) are refunded in total.

2. When withdrawal is completed after classes have begun but before the close of the second week of classes, 75 percent of the fee balance (less $11) is refunded.

3. When withdrawal is completed after the close of the second week but before the close of the fourth week of classes, 50 percent of the fee balance (less $11) is refunded.

4. When withdrawal is completed after the close of the fourth week of classes, no refund is given.

Refunds are based upon the date of application for refund after completion of withdrawal and not from the date of last attendance of class, except in cases of illness. When a student has paid special fees (such as fees for physical education, art and architecture, chemistry, mathematics, and the *Gem of the Mountains*), he or she must contact the respective office for a refund.

Refund of Music Fees. Special music fees for individual instruction in performance studies may be refunded upon prompt application by the student withdrawing. Application for this refund should be made to the director of the Hampton School of Music.

Student Housing

The University of Idaho is a residential campus with more than two-thirds of the single undergraduate students living in residence halls, fraternities, and sororities. The university recognizes that a student's total education is influenced by the nature and quality of the living environment outside the classroom and encourages the development of an environment in the living groups that will be conducive to broad intellectual growth and greater participation in the life of the academic community. Campus living groups benefit from guidance services provided by advisers associated with them.

In addition to 23 independent living groups and 24 sororities and fraternities, the university provides accommodations for married students and graduate students. Additional housing is available in Moscow and the surrounding area and information may be requested from the Moscow Chamber of Commerce, 411 South Main, Moscow, Idaho 83843, or the ASUI Housing Referral Office, SUB.

Appropriate regulations are established by the university to ensure acceptable living arrangements for all students.

Residence Halls

The university houses 23 living groups in 8 residence halls and provides meal services for the students who live in 21 of them. Two of the living groups, Steel House (women) and Targhee Residence (men), are cooperatives where students contribute their share of the labor in the kitchen, dining room, and public areas to reduce living costs. The Alumni Residence Center, for men and women who are 21 years of age or older or have graduate-student status, contains efficiency apartments, each with its own cooking facilities. Each residence hall has study and recreation areas, lounges, and complete laundry facilities; commercial linen service is also available. Personal items, such as sheets, pillowcases, bedding, towels, and other articles deemed convenient or necessary, are NOT furnished by the university residence halls and should be provided by the student.

See the section headed "Fees and Expenses" above, for the approximate cost of living in residence halls. More detailed information concerning student housing may be obtained from the Residence Halls Office, Wallace Residence Center.

Sororities

Seven national sororities have chapters on the University of Idaho campus. Each chapter owns and operates its own house. These are: Alpha Gamma Delta, Alpha Phi, Delta Delta Delta, Delta Gamma, Gamma Phi Beta, Kappa Kappa Gamma, and Pi Beta Phi. The average cost for living in a sorority is about $1,300 a

semester, which includes charges for room, board, social fees, and house corporation building fund. In addition there are pledge and initiation fees that are paid only once. Panhellenic Council coordinates intersorority relationships and formulates policies on rushing procedures.

Arrangements for Sorority Living. Membership in a sorority is by invitation only. Those women who are interested in sorority living should complete the appropriate section of the application-for-admission blank or write a letter to Panhellenic Council, Student Advisory Services. The selection of members in each sorority is made primarily during participation in a program known as "Formal Fall Rush," which is held before the beginning of the fall semester. Registration for rush *should be postmarked no later than July 20* and sent to Student Advisory Services. Formal Fall Rush is not the only opportunity to pledge a sorority; however, it is the only time each year that all sororities are participating in rush. Contact Student Advisory Services if you are unable to participate in Formal Fall Rush but are interested in sorority membership.

Fraternities

Chapters of 17 national fraternities are maintained on the University of Idaho campus. They are: Alpha Tau Omega, Beta Theta Pi, Delta Chi, Delta Sigma Phi, Delta Tau Delta, FarmHouse, Kappa Sigma, Lambda Chi Alpha, Phi Delta Theta, Phi Gamma Delta, Phi Kappa Tau, Pi Kappa Alpha, Sigma Alpha Epsilon, Sigma Chi, Sigma Nu, Tau Kappa Epsilon, and Theta Chi. Each of these groups is represented in the Interfraternity Council, which unites them in common service to the university and promotes a spirit of cooperation and self-government among fraternities.

Membership in a fraternity is by invitation from the members of the group concerned. The university does not make arrangements for membership. The average cost for living in a fraternity is about $1,300 a semester, which includes charges for room, board, and social fees.

Arrangement for Fraternity Living. Anyone interested in fraternity living should so indicate on the admissions application or write for information to: Interfraternity Council, Student Advisory Services. Those who indicate an interest in fraternity living will receive information from the various fraternities during the spring and summer before their matriculation in the university. Invitation for living in a fraternity will generally be extended by the fraternities during the summer before matriculation; however, if necessary, these arrangements can be made through the Interfraternity Council upon arrival on campus for the fall semester.

Family Housing

For married students with families, the university operates three housing projects and more are being developed. Apartments in these projects in 1990-91 rented for about $210-275 a month. One-, two-, and three-bedroom units are available; some are not furnished. A $100 advance deposit and last month's rent are required. To apply for an apartment, write to the Family Housing Office. Day care facilities are available on a first-come, first-served basis.

Student Services

Student Rights, Conduct, and Records

The "Statement of Student Rights," "Student Code of Conduct," and "Student Records Policy" are published in the Time Schedule. Members of the university community are urged to familiarize themselves with these basic documents.

Academic Advising and Counseling

Academic advising is regarded by the faculty as an extension of the teaching function and, therefore, as an important responsibility of each faculty member. Each matriculating student is provided with the assistance of an adviser, a member of the faculty, who attempts to communicate to students, particularly freshmen, the meaning of higher education and its significance to the student. Advisers also explain university academic requirements and assist individual students in developing programs that satisfy these requirements. The Student Counseling Center and the Career Planning and Placement Center are available to assist students who are uncertain about their career objectives or are having difficulty with required curricula (see entries for these two centers below). Students should bear in mind that they have the primary responsibility for their own careers; therefore, they must take the initiative in seeking out advice and counseling. Assistance, both formal and informal, from faculty advisers and specialists, is available once sought.

Tutoring and Academic Assistance Center

The Tutoring and Academic Assistance Center (TAAC) is the university's central academic support program. Its services include: a freshman study skills class (see Inter 101 in part five), tutoring in specific classes, group study sessions for specific classes, individual counseling for academic difficulties and for improving reading skills, and a faculty-sanctioned test file.

All services of the TAAC are free to University of Idaho students. The TAAC is located at the corner of Idaho and Line Streets (phone 208/885-6307).

Student Advisory Services

The University of Idaho is comprised of a diverse student population: 25 percent of the students are married; 45 percent of the students live on campus in 17 fraternities, 7 sororities, and 23 living groups in 8 residence halls. Approximately 20 percent of the students are from out of state, and the international students represent 40 different countries. Students spend two-thirds of their time in out-of-class activities including clubs, student government, studying, intramurals, and intercollegiate activities.

A diverse student population requires that UI have a diverse student services program. Student Advisory Services provides a variety of services that focus on assisting all students. Programs and services include advising students in living groups as well as those off campus, and ethnic minority students, veterans, and international students. In addition, Student Advisory Services coordinates New Student Orientation, Women's Center, Child Care Center, and National Student Exchange Program, and provides judicial assistance to students, faculty, and staff. Two programs that are an integral part of the student's academic program are the Beat Academic Advising Program and the Peer Consultant Program.

Staff members in Student Advisory Services are trained to work with individuals and groups of students and they serve as a liaison between students, departments, and agencies on and off campus.

All of the services and programs of Student Advisory Services are supportive of the academic mission of UI and are an integral part of the student's total education at the university.

Study Abroad

Student Advisory Services and the International Programs Office maintain information on many kinds of foreign study and travel available to Idaho students and faculty. University of Idaho students may earn credit for foreign study and study-touring in the following ways:

1. Official University of Idaho study tours—credit may be earned under Ed 273 and 473 and departmental "special-topics" courses 204 and 404.

2. Directed study—students may plan their own educational experiences abroad, and arrange *in advance* for credit from any appropriate department. This is for education comparable to that gained in the other courses of the department, but it may be as general and inclusive as the department will allow.

3. Course challenge—certain courses may be challenged on the basis of knowledge gained abroad. See regulation D-4.

4. External study/experience—credit may be awarded to students for knowledge and/or competence gained in foreign travel. See regulation I-5. In view of the documentation required, the procedure noted in 3 above is much more effective than this "after-the-fact" procedure.

5. Transfer of credits—work in other accredited institutions of higher learning can be recognized by the transfer of credits to the University of Idaho. This work may be in the study-abroad programs of other American schools or in foreign schools. Student Advisory Services has a variety of reference materials available for students to look through.

6. International Student Exchange Program—UI participates in the International Student Exchange Program (ISEP) administered by an office at Georgetown University. Students with junior, senior, or graduate status, a 3.0 or better grade point average, and two years of college-level language study (if applicable) are eligible to apply for nomination to this program for a semester or year of study abroad.

For more information about foreign study or travel, call or visit Student Advisory Services (telephone 885-6757) or the International Programs Office (telephone 885-8984).

Women's Center

The Women's Center serves as the focal point for women's concerns at the university and in the community. It provides a warm, comfortable place where people can explore what it means to be women and men in a changing world. It brings together people of diverse backgrounds who share a commitment to opportunity, equality, and justice for women. Programs and services at the Women's Center include: lunch programs—presentations and discussions every Tuesday and Wednesday at 12:30 covering a wide variety of topics; library—a circulating library of over 800 books dealing primarily with women's issues and women's lives; resource files—vertical files of information about women and women's issues; information and referral—answers to questions and referral to other agencies and services; peer counseling—listening and support for human problems; drop-in lounge—a place to relax, read, study, meet friends, and exchange ideas; outreach—programs and speakers for campus and community organizations; newsletter—a monthly publication including information about current programs and services and news about women's issues. The Women's Center is the headquarters for the Campus Rape Education Program. The center assists with the Non-traditional Students Program and the Martin Luther King Jr. holiday.

National Student Exchange

National Student Exchange (NSE) gives University of Idaho students the opportunity to attend one of 80 colleges or universities throughout the United States for one or two semesters. UI students pay UI fees or the resident fees of their host campus. Students normally need to apply by February for the next academic year.

Credits and grades earned on exchange are incorporated into the student's University of Idaho academic record and grade-point average, and credits earned fulfill University of Idaho residence-credit requirements.

To qualify for participation in the NSE, a student should: (1) be a full-time University of Idaho student; (2) be a sophomore, junior, or first-semester senior at the time of exchange; and (3) have a grade-point average of 2.5 at the time the application is filed. Information and applications may be obtained from the NSE Office in Student Advisory Services, UCC 241 (208/885-7979).

Services for Students with Disabilities

The University of Idaho has established services for students with disabilities in accordance with Section 504 of the Rehabilitation Act of 1973, as amended in 1986. The coordinator of disabled student services is available to assist disabled persons plan, arrange, and locate services they require because of their disability. The Campus Guide for People with Disabilities is available in print and can be provided in large print, braille, or on tape with 10 working days' notice.

Prospective students are invited and encouraged to visit the campus and meet with the coordinator of disabled student services to discuss specific concerns and needs.

Students are asked to notify Student Advisory Services as soon as possible if they will require disability-related services. (Students requiring academic assistance and learning disabled students should contact Student Support Services—see below.) This voluntary self-identification will not adversely affect any admissions decision.

For further information or to make arrangements, contact the coordinator of disabled student services in Student Advisory Services, UCC 241 (telephone 208/885-6757).

Student Support Services

Designed to complement existing campus resources, this federally funded educational assistance program provides a comprehensive and highly individualized array of personal and academic support services to help students reach their educational goals. Each year, a designated number of students who are either (1) low income, (2) from first generation families (neither parent has a baccalaureate degree), or (3) physically/learning disabled are eligible for enrollment. Students are accepted on a first-come, first-served basis. Further information is available by contacting the Student Support Services Office, Phinney Hall 302 (telephone 208/885-6746).

Learning Disabled Students

To obtain information or arrange for services, students with learning disabilities are encouraged to contact the Student Support Services Office as soon as possible. Although the program offered through the Student Support Services project is not designed exclusively for students with specific learning disabilities, many of the services provided are essential to their academic achievement. Documentation is required, and limited on-campus assessment is available. Contact Student Support Services, Phinney Hall 302 (telephone 208/885-6746).

Minority Student Programs

Minority Advisory Services assists specific minority students and groups, i.e., Asian Americans, Black Americans, Native Americans, Spanish Americans, and nontraditional students in the following areas: academic advising and counseling, academic scheduling, various counseling and referral services, recruitment and retention services, office and student advocacy services, and financial aid information and planning services. Although these services are available to all students, Minority Advisory Services is designed to provide them more specifically to ethnic minority and nontraditional students.

All minority and nontraditional students are eligible for a full range of federal financial assistance as well as the opportunity to share in all university financial aid programs. In addition, several scholarships are available to minority students based on need and academic performance.

Counseling Center

Many students find that it is helpful to discuss their concerns with a professional who takes the time to listen and understand. Staff members of the Student Counseling Center, including psychologists, counselors, and a psychometrist, are available to meet with students to discuss personal, educational, or vocational concerns. Counseling can help students learn more about themselves and develop new skills to deal more effectively with personal problems, problems with abusing alcohol or other substances, relationships, and academic pressures.

The center offers the following services: individual counseling, group counseling, couples counseling, educational and career counseling, educational presentations, referral, and testing. In addition to psychological and vocational testing, the center coordinates and administers all of the national testing programs such as the GRE, ACT, NTE, LSAT, and TOEFL.

The center also maintains a self-help resource room that contains books, tapes, and other informational materials on a wide variety of topics related to emotional health and well-being. The resource room also contains vocational information on more than 700 career options as well as college catalogs for undergraduate and graduate programs throughout the region. Students are welcome to use the resource room on a drop-in basis. All services are available to full-time students and their spouses without charge. An appointment may be scheduled by coming to the Student Counseling Center, UCC 309, or by calling 208/885-6716.

Student Health Service

The Student Health Service is open when the university is in session, affording care to full-time and part-time students, student spouses, and dependents.

Patient care is available for fall, spring, and summer sessions, except during vacations. The Student Health Service is open Monday through Friday, 8 a.m. to 4:30 p.m. (including the noon hour) during fall and spring semesters. Summer hours are 8:30-11:30 a.m. and 1-4 p.m. It operates on a walk-in basis, with no appointment necessary. Emergency care is available at Gritman Memorial Hospital when the Student Health Service is closed.

The Student Health Service provides out-patient care only. When hospitalization is necessary, patients will be admitted to Gritman Memorial Hospital. Psychiatric evaluation is available from consulting psychiatrists, by referral from the Student Health Service or the Student Counseling Center. Nominal fees are charged for out-patient visits, certain procedures, and special services such as lab tests, x-rays, and medications.

Students and interested family members are encouraged to visit the Student Health Service and acquaint themselves with the services available.

Health and Accident Insurance Coverage

All students are automatically covered by accident insurance during the academic year. The insurance does not cover illness. Coverage is limited to accidents that occur on the university campus, at the student's residence, on property leased or owned by the university wherever located, and—except as otherwise limited—to participation in official university programs and travel authorized by the university. Benefits are payable at 80 percent of usual, customary, and reasonable medical expenses due to accident, subject to exclusions and limitations in the policy. Limits of this coverage are $5,000 in benefits paid after a $100 deductible per accident ($500 deductible for Club Sports accidents).

An optional health and extended accident insurance plan is available to full-time University of Idaho students and their spouses/children. This insurance is intended to supplement the services provided at the Student Health Center and the insurance protection provided by the basic accident insurance described above.

Optional health and extended accident insurance is designed to offset expenses resulting from a major accident or serious illness that might require medical care, hospitalization, and surgery beyond services provided at the Student Health Center or covered by basic student accident insurance. When purchased for the year, optional health and extended accident insurance provides coverage for a full year whereas the Student Health Service and the protection of the basic accident plan are available only during the time the university is in session. Optional health and extended accident insurance supplements Student Health Services by providing coverage for services that must be obtained elsewhere such as hospitalization or referral to a specialist.

Students are asked to indicate during registration whether they wish to purchase optional student health insurance. Fees are paid at that time. Insurance may also be purchased directly from the agent within 30 days after registration. Students who do not have other health insurance and students with dependents are especially urged to purchase optional health and extended accident insurance. International students must either purchase optional health and extended accident insurance or document coverage by equivalent insurance as part of their obligation to establish proof of financial responsibility for expenses incurred while attending the university.

Brochures describing the Student Health Service, the mandatory accident insurance, and the optional health and accident insurance are available from the Student Health Service and are distributed during registration.

Financial Aid

Financial aid is available through the Office of Student Financial Aid Services to qualified students who are in need of financial assistance to meet the normal costs of college attendance by helping them secure part-time employment, scholarships, State Student Incentive Grants, Perkins National Direct Student Loans, Stafford Guaranteed Student Loans, Parent Loans for Undergraduate Study, Supplemental Loans to Assist Students, and Pell and Supplemental Educational Opportunity Grants. Students interested in only no-need scholarships must submit a completed UI application for admission before the March deadline. Students interested in all scholarships and federal student financial assistance must submit the UI Scholarship and Financial Aid Application, the application for admission, and the College Scholarship Service Financial Aid Form (FAF) results. The results of the FAF, a completed application for admission, and the completed UI financial aid application must be received by the Office of Student Financial Aid Services by the deadline in early March for the following academic year to receive full consideration for all types of aid. Because the FAF takes six weeks to process, it should be completed and forwarded to the processor during the first three weeks of January. The exact deadline will be published in the financial aid brochure each year. If application forms or the description brochure were not received with the admissions material, they may be obtained from the Office of Student Financial Aid Services. Students who do not meet the March deadline may still apply for Pell Grants and Stafford Guaranteed Student Loans.

Students who qualify under the Federal Work-Study Program or Idaho State Work Study Programs (with respect to a definite and demonstrable financial need) may obtain part-time employment with the university. Application for work-study is made as part of the general application for financial aid. In most cases work-study job placements cannot be made before a student actually arrives in Moscow and has registered.

To receive state and federal student financial assistance a student must be in good academic standing according to the Financial Aid academic progress standards. A student does not meet the academic standards and therefore is not eligible for financial aid if having completed 0-32 credits the cumulative GPA is less than 1.60, or if having completed 33-64 credits the cumulative GPA is less than 1.80, or if having completed 65 or more credits the cumulative GPA

is less than 2.00. The student must also progress toward a degree at the rate of at least 24 credits per academic year. A student who attends fall or spring semester only must complete at least 12 credits during that one semester. Once a student has accumulated 24 credits more than the minimum number required for a baccalaureate degree, the student is not eligible for financial assistance.

A graduate student is expected to make satisfactory academic progress to receive federal or state financial aid. A graduate student whose cumulative GPA is less than 3.00 is not eligible to receive financial assistance. The student must progress toward his or her degree by completing at least 18 credits per academic year. A student who attends fall or spring semester only must complete at least 9 credits during that one semester. Once a student accumulates 42 credits toward a master's degree, 72 credits toward a specialist or Master of Fine Arts degree, or 96 credits toward a doctoral degree, he or she is no longer eligible to receive financial assistance.

A student who holds any baccalaureate degree is considered a graduate student for financial aid purposes, as required by federal law. College Work-Study and loans may be awarded to these students, but on a lower priority basis.

All students receiving financial aid will be evaluated for satisfactory progress at the end of each academic year. All students applying for Title IV financial aid must be making satisfactory progress regardless of whether they have previously received aid.

On receiving a written petition from the student, the student's academic dean may recommend a waiver of the above criteria in a signed memorandum to the director of student financial aid, who makes the final decision. (It is to be noted that the eligibility criteria for financial aid differ from those for academic eligibility contained in regulation L-5.) The decision of the director of student financial aid may be appealed to the Student Financial Aid Committee and then to the Administrative Hearing Board. Students suspended from receiving aid may reinstate their aid eligibility by successfully completing 12 credits with a GPA within the established limitations. Once the successful semester has been completed, a written request for reinstatement must be submitted to the Office of Student Financial Aid Services by the student.

Students enrolled for less than full-time loads will have a lower priority for aid, and any aid given will generally be in proportion to their credit loads.

Nonmatriculated students and students enrolled in correspondence and video classes are not eligible to receive federally funded financial aid.

Financial aid policies and procedures may change at any time to assure compliance with federal regulations. The Office of Student Financial Aid Services may be contacted about the most current policies. Additional information concerning financial aid is available in a student financial aid brochure published each year.

Veterans' Benefits for Educational Assistance

The Office of Veteran Affairs assists veterans, dependents, reservists, and national guardsmen who are eligible for educational benefits through the Veterans Administration. Students expecting to receive veterans benefits must apply for benefits and should contact the Office of Veteran Affairs at least six weeks before the beginning of each semester.

To qualify for payments, all veterans must be released under other than dishonorable conditions. To receive full benefits, a veteran must be pursuing an approved course of study leading to a degree or other professional objective. To be considered full time, undergraduate students must carry 12 credits or the equivalent, and graduate students must carry 9 credits or the equivalent (see regulation O-1 in part 3).

An advisory service is available to veterans and additional information, advice on benefits, or application forms may be obtained by writing to the veterans' adviser in Student Advisory Services (UCC 241).

Special Awards

Many awards are made each year in recognition of outstanding achievement both in academic and nonacademic pursuits. For more information, contact the individual academic department or, for non-academic awards, the ASUI Office.

Recreational, Social, and Extracurricular Activities

The Student Union is the recreational and social center for the university community. Facilities include bowling alleys, billiard tables, music listening rooms, computer study rooms, cafeteria, snack bar, ballroom, theater, and meeting and banquet rooms. The twice-weekly campus newspaper, the *Argonaut,* and the yearbook, the *Gem of the Mountains,* are published by ASUI (Associated Students University of Idaho). These publications offer opportunities for those interested in journalism or photography. ASUI (to which every student who pays regular fees belongs) supports outdoor recreation programs, speakers, films, dances, entertainment, and special events. Extensive intramural athletic programs are available for both men and women under the direction of Campus Recreation. Recreational facilities located on the campus include the Kibbie-ASUI Activity Center, indoor and outdoor tennis and handball courts, golf course, and swimming pools.

Intercollegiate Athletics

Idaho has a strong intercollegiate athletic program for both men and women within the combined Athletic Department.

The teams are known as the Vandals. The men's program includes football, basketball, cross country, indoor and outdoor track, tennis, and golf.

The Vandal football team competes in NCAA Division I-AA with some 93 other institutions across the country. All other men's and women's sports compete in NCAA Division I.

The women's program consists of basketball, volleyball, cross country, indoor and outdoor track, and tennis.

The men's and women's programs compete as members of the prestigious Big Sky Athletic Conference, which includes nine members. In addition to Idaho, Big Sky Conference members include Boise State University, Eastern Washington University, Idaho State University, Montana State University, Northern Arizona University, University of Montana, University of Nevada-Reno, and Weber State College.

The athletic program is fortunate to have splendid facilities that are among the best in the Northwest. The Kibbie-ASUI Activity Center (also known as the "Dome") houses the Athletic Department offices, team locker rooms, weight room, and athletic training room. The Dome itself is the site for football and all basketball games. The 17,000 seats for football and approximately 10,000 seats for basketball make it an outstanding facility. Track and field and tennis make great use of the Dome as well with the five-lane, 300-meter track and the eight indoor tennis courts. The University of Idaho Swim Center is a magnificent two-pool facility, and the new Chevron 400-meter outdoor track stadium is a real asset. The 18-hole championship golf course and numerous outdoor tennis courts complete the facility picture.

Student Organizations

University of Idaho students may organize or join associations to promote their common interests. There are many student organizations on campus with varied objectives and programs. A list of these organizations, together with names of current officers, is maintained and information concerning them may be obtained from the ASUI secretary.

New Student Services

The Office of New Student Services represents the University of Idaho to prospective students and assists those students and their counselors and parents with decisions about higher education. Staff members visit high schools and present programs about the university to interested students, attend college fairs, distribute brochures, coordinate the flow of information from UI's colleges to students who express particular educational interests, and answer questions raised by students, counselors, and parents.

New Student Services also sponsors a campus visitation program that offers prospective students an opportunity to spend two days on campus. Staff members provide campus tours, living group tours, and overnight lodging, arrange appointments with faculty members, suggest classes and activities that prospective students may attend, and provide meal tickets and activity passes. For more information, call the Office of New Student Services, 208/885-6163, or 800/422-6013 from in state.

Career Services Center

The purposes of the Career Services Center are to (1) assist UI students in any field of study and at any academic level in identifying and working toward their career objectives; (2) assist students and alumni in obtaining employment appropriate to their ability, education, and experience; and (3) serve the state, region, and nation by providing information on curricula and graduates to prospective employers.

A principal feature of the center is the establishment and maintenance of a placement file for each registrant seeking employment. The files contain educational and experiential data as well as recommendations in conformance with the Educational Rights and Privacy Act. Throughout the year, representatives of business, industry, government, and education come to the center to interview student and alumni registrants. The center also maintains a part-time and summer placement system, and provides weekly newsletter publications that list employment opportunities.

Alumni Association

The University of Idaho Alumni Association exists to coordinate the support of alumni and friends of the university in strengthening the academic, research, service, and leadership-building programs of the institution. It also provides individual alumni services to its members throughout the world.

All former students who earned 90 or more credits at UI and associate and honorary alumni are members of the association. Those students with 26-89 credits may be added by request. The director of alumni relations and staff, along with an elected board of directors, guide the many programs and activities of the more than 60,000 members.

The Alumni Association strives to keep alumni informed about their alma mater, encourage alumni moral and material support, and apprise the university community of alumni opinion. Through a variety of awards, the association honors outstanding alumni or other individuals who provide exceptional service to the institution or state of Idaho. Scholarships are given by the association to help entering students attend the university.

Alumni maintain close ties with the university as a result of Alumni Association services, such as travel tours, continuing-education programs, and campus and worldwide gatherings for special UI occasions, including Homecoming and Silver and Gold Days. The Alumni Office gathers and maintains records of alumni, and this contact service is available to the university and its alumni. The association also provides and organizes support for the university through active organizations, such as the Parents Association and the Student-Alumni Relations Board.

Areas of recent emphasis for the association include informing prospective students about the university, providing continuing education opportunities, establishing a Career Network, and increasing volunteer support through the development of alumni chapters and constituency groups.

Religious Activities

The university is served by three campus religious centers: Campus Christian Center, corner of University and Elm; LDS Institute of Religion, 902 Deakin; and St. Augustine's Roman Catholic Center, corner of Sixth and Deakin. These centers provide opportunities for the study and practice of religion as well as resources in counseling and guidance.

All of Moscow's churches provide opportunities for religious development for University of Idaho students.

General Requirements and Academic Procedures

These regulations were in effect as of January 1, 1991. See the Time Schedule for any substantive changes that may have been approved after this catalog went to press.

The following procedures and regulations have been adopted to help students, faculty members, and administrators successfully carry out UI's overall academic program. It is the responsibility of registration advisers, major professors, or deans to assist students to understand and comply with academic procedures. The registrar assists by checking students' records for compliance with the regulations in this section of the catalog. Students, with the help of faculty advisers, should check their records at each registration to ensure that they are systematically and progressively fulfilling their degree requirements. Students are responsible for knowledge of and compliance with academic procedures and standards, but should seek guidance whenever questions arise. Requests for waivers of curricular requirements, academic provisions, or academic standards should be presented to the appropriate department and/or college.

Students may petition the appropriate committee for exceptions to the administrative and academic regulations of UI. Petitions are submitted to one of the following committees depending on the nature of the petition.

Academic Petitions Committee. Student petitions for exceptions to the requirements and procedures in this catalog section (part 3) should be presented to the Academic Petitions Committee on forms available in college offices.

Academic Hearing Board. This committee hears student appeals from decisions made by college authorities concerning, but not limited to, such matters as (1) eligibility for advanced placement or credit by examination, (2) objectivity or fairness in making, administering, and evaluating class assignments, (3) maintenance of standards for conscientious performance of teaching duties, and (4) scheduling of classes, field trips, and examinations. The board does not hear appeals concerning requirements or regulations of the College of Graduate Studies or the College of Law.

Administrative Hearing Board. Students submit appeals to the Administrative Hearing Board on administrative decisions in such matters as residence status for tuition purposes, granting of student financial aid, and assessment of fees or charges (except in connection with parking regulations), and disputes involving interpretation and application of policies concerning such matters as student records, smoking, and treatment of disabled persons.

Appeals from decisions of the Academic Petitions Committee and the Academic Hearing Board are submitted to the vice president for academic affairs and research. If the vice president concurs with the body whose decisions was appealed, the appellant then may appeal to the president and regents if the president and regents consent to hear the appeal.

Decisions of the Administrative Hearing Board may be appealed to the president and regents when they consent to hear such appeals.

A—Matriculation

Applicants for enrollment in any course offered by UI for college credit, except correspondence study, submit personal data and credentials covering all previous academic work. (See "Admission to the University" in part 2.) After UI has received these credentials and approved the application, registration forms are prepared and the applicant's first registration at UI concludes the matriculation process.

B—Registration

B-1. Preparation of Registration Materials. Official registration forms are prepared for new students as described above. They are also prepared for students enrolled in a given semester or summer session for the succeeding semester. Former students who have not been enrolled in UI for a semester or longer should notify the registrar of their intention to reregister at least one month before the opening of the term. Such students will be required to submit transcripts from any institutions attended since their last registration at UI, and they may also be required to complete a residence questionnaire. Failure to meet the deadline may cause a delay in registration.

B-2. Admission to Classes.

B-2-a. Instructors do not admit anyone to class whose name does not appear on the class roster or for whom they have not signed an "add" card. UI professors are given the authority to grant or deny access to classes by visiting scholars.

B-2-b. At the beginning of each academic session, students with their advisers' aid complete a trial study list. The information is then transcribed to the official registration form, which is signed by the adviser and is checked by such intracollege procedures as the student's college may require. After obtaining necessary approvals and receiving departmental validation for each course, the student files the completed registration form with the registrar. On payment of fees, admission to classes is authorized.

B-3. Auditing Classes. Auditing a course consists of attendance without participation or credit. Only lecture classes may be audited. Audited courses are not recorded on a student's permanent record, except as provided in the chart with regulation C-1.

B-4. Registration for Zero Credit. Any course offered for credit may be taken for zero credit. The implications of zero credit are:

B-4-a. Registrants are expected to do the assigned work and attend class sessions. Grades are received on the same basis as if the course were taken for credit and are entered on permanent records.

B-4-b. Students enrolled in a course for zero credit may take it P/F. This is separate from the "pass-fail option" outlined in B-11.

B-4-c. Courses taken for zero credit do not fulfill requirements.

B-4-d. Zero-credit grades have no effect on a student's grade-point average. Neither do they affect academic eligibility, disqualification, or reinstatement.

B-4-e. Students enrolled for zero credit count as regular registrants for statistical purposes, such as listing course enrollments, computing instructors' loads, and determining departmental services.

B-5. Correspondence-Study Courses. A student enrolled in the regular program is permitted to carry correspondence-study courses for college credit only with the prior written approval of his or her academic dean. Credit for correspondence-study courses will not be accepted without such approval.

B-6. Registration for Courses Without Completion of Prerequisites. Students who have not completed the prerequisites to a course for which they are otherwise eligible may register for the course with the instructor's approval.

B-7. Registration of Lower-Division Students in Upper-Division Courses. All academic programs give priority in the first two years to meeting the general requirements for the appropriate degree and acquiring the foundation for advanced study; therefore, lower-division students may not take upper-division courses. Exceptions may be made for students who have fulfilled the prerequisites and who are well prepared in their field of study. In such cases, the instruc-

tor may, with the concurrence of the student's adviser and academic dean, authorize the exception.

B-8. Registration of Undergraduate and Nonmatriculated Students in Graduate Courses. Undergraduate and nonmatriculated students may register in graduate courses under the conditions outlined in the Graduate Bulletin with the prior written approval of the instructor of the course, the student's adviser, and the dean of the College of Graduate Studies.

B-9. Registration of Students with Baccalaureate Degrees as Undergraduates. To register as undergraduates, students with baccalaureate degrees must secure the permission of the dean of the undergraduate college and file a statement with the registrar indicating that they understand that the work will not be classified as graduate work and cannot be used toward a graduate degree at a later date. (See J-7-b and c.)

B-10. Registration for Accelerated and Other Short Courses. Students may register for accelerated and other short courses at any time up to and including the starting date of the course without petition.

B-11. Pass-Fail Option.

B-11-a. Undergraduate Students.

(1) After consultation with their advisers, undergraduates who have a cumulative grade-point average of 2.00 or higher are permitted to enroll in one course a semester under this P/F option. (The grade-point requirement is not applicable to students who are taking university-level courses for the first time.) This procedure is separate from taking courses that are regularly graded P/F. Within the limitations specified above, an undergraduate may enroll under the pass-fail option in any course EXCEPT: (a) courses listed by number and title in the student's major curriculum as printed in part 5; (b) courses taken to meet the distributional requirements of the college or curriculum, unless allowed for P/F enrollment by the department in which the student is majoring; (c) courses in the major subject field; and (d) courses in closely related fields that are excluded from this option by the student's department. (See B-11-d for "Reporting of Grades.")

(2) Students in officer education programs (OEP) may enroll under this regulation in courses required because of their affiliation with the OEP ONLY with the permission of the administrator of the OEP department concerned.

(3) A maximum of 12 credits earned in courses under this regulation may be counted toward a baccalaureate degree.

B-11-b. Graduate Students.

(1) With the approval of the major professor concerned (or adviser in the case of an unclassified student) and the dean of the College of Graduate Studies, graduate students may enroll in a limited number of courses under this P/F option. This procedure is separate from taking courses that are regularly graded P/F.

(2) Courses that may be taken by graduates under this regulation are: (a) any course that the student's graduate committee deems not essential to the major field and (b) any course required to remove a deficiency or to provide background for the student's program, unless the major department stipulates that such deficiency courses must be taken on a regular-grade basis and completed with an A or B.

(3) Of the minimum number of credits required for a degree, no more than three credits in a master's or specialist program or nine in a doctoral program may be taken under this P/F option.

(4) To have P recorded for courses taken under this regulation, a graduate student must earn a C or above. A grade of D will be converted to an F on the student's records.

(5) An unclassified student may enroll for courses under this option with the approval of his or her adviser (if assigned) and the dean of the College of Graduate Studies. If, however, at a later date an unclassified student is admitted to a degree program, the above regulations apply and no changes to regular letter grades will be permitted.

B-11-c. Adds, Drops, and Changes. Students may add or drop a P/F option course in the same manner as a regular course, and they may change from P/F to regular-grade classification, or vice versa, if they do so no later than the deadlines stated in regulation C and the academic calendar. Students may make these changes by securing the signatures of the adviser or major professor and dean concerned.

B-11-d. Reporting of Grades. Instructors are not notified as to which students are enrolled in courses under this P/F option. Grades are reported in the same manner as grades in courses taken on a regular-grade basis. The registrar is responsible for converting Cs or above to Ps on students' records and, for graduates, Ds to Fs. Grades of D reported for undergraduates are recorded on students' records and are not converted.

B-12. Registration for Fewer Credits than Authorized. Students may register for a particular course for fewer credits than indicated in the Time Schedule (they may also register for zero credit under the conditions outlined in B-4); likewise, departments may list courses in the Time Schedule for fewer credits than the number authorized by this catalog.

C—Changes in Registration

C-1. Students may change their registration as provided in the "Semester Schedule for Changes in Registration" accompanying this regulation. All registration changes are effective on the date they are filed with the registrar, except in the case of withdrawal from the university before the end of the second week following midterms, which is effective on the date the indefinite-leave-of-absence card is filed in the office of the student's academic dean (see G). Students may not drop a course by simply staying out of class. Students are expected to obtain the signature of the class instructor, adviser, and dean on the drop card. These signatures are informational and do not necessarily indicate approval.

C-2. Credit Withdrawal Limitation.

C-2-a. The number of credits that may be dropped and recorded on the student's permanent record is limited to 20 credits during a student's undergraduate career at UI. Petitions must be submitted to the Academic Petitions Committee to drop more than 20 credits during a student's undergraduate career at UI.

C-2-b. If a student attempts to drop a course that would bring the total credits he or she has dropped above 20, the student will not be allowed to do so. If a student attempts to drop two or more courses simultaneously and together they would bring his or her total credits dropped above 20, the student will be asked, through the dean's office, to submit a revised request to drop only one course or a combination of courses that would not cause the limitation to be exceeded. If the student cannot be reached or fails to submit a revised request, the registrar will record dropping the course or combination of courses that bear the highest course numbers and not cause the limitation to be exceeded; the dropping of the remainder will not be allowed.

D—Credit and Continuing Education Unit

D-1. Unit of Credit Defined. One unit of credit represents what a typical student might be expected to learn in one week of full-time study (40-45 hours including class time and preparation). Each course is evaluated by a system of credits related to time spent in class, lab, study-preparation, or field investigation. A semester credit is expected to require a total of three hours of scholarly activity each week. Ordinarily one 50-minute hour of class attendance is scheduled for each credit, but any combination of class attendance, lab, study-preparation, or field investigation may be arranged. When students are permitted to register for credit in workshops and

similar short courses, credit is granted on the basis of one semester credit for each week of full-time scholarly activity required. Exceptions to this policy for undergraduate courses must be approved by the University Curriculum Committee. Exceptions for graduate courses must be approved by the Graduate Council and the University Curriculum Committee.

D-2. Credit-Load Limitations. (Also see J-5.) The maximum loads specified below include credits for which the student is concurrently registered at other institutions (e.g., Washington State University and Lewis-Clark State College).

D-2-a. Regular Semester. A student may register for no more than 20 credits in a semester. This number may be increased to 22 with specific written approval by his or her academic dean. Registration for more than 22 credits (except for students enrolled in the WAMI Medical Education Program) is permitted only on approval of a petition to the Academic Petitions Committee (petition forms are available in deans' offices).

D-2-b. Summer and Other Sessions. A student may register for no more than 10 credits in an eight-week period. This number may be increased to 11 with specific written approval by his or her academic dean. The following limits for shorter sessions also apply:

Weeks	Credit Limitations
6	8
4	6
3	4
2	3
1	1

In the case of overlapping or consecutive periods, the limitation for the longer inclusive period governs. Registration for more than the above stated limits is permitted only on approval of a petition to the Academic Petitions Committee (petition forms are available in the deans' offices) or by prior approval of the University Curriculum Committee. Registration for courses with conflicting or overlapping meeting times is prohibited. In addition, academic deans review workshop and other short courses to ensure that standards and quality are maintained. NOTE: This regulation prohibits students from registering for two 1-credit workshops in the same week.

D-2-c. Graduate-Student Appointees. An instructional or graduate assistant may register for no more than 12 credits in a semester or 6 credits in an eight-week period. On the written recommendation of the employing dean and approval by the dean of the College of Graduate Studies, an appointee is permitted to register for more than 12 credits in one semester but not more than an aggregate of 24 credits during two successive academic-year semesters.

Semester Schedule for Changes in Registration

See calendar in the front of the catalog for dates. The schedule for changes in enrollment in accelerated or short-courses or during summer session is prorated, based on the number of class-meeting hours (see notes below). The calendar in the front of the summer bulletin lists the dates for summer session.

DESIRED CHANGE	First two weeks of classes*	Third and fourth weeks*	Fifth week to end of second week following midterms**	After end of second week following midterms***
Drop course.	File form with registrar, if withdrawal is permitted (see regulations C-1 and C-2). No grade recorded.****		File form with registrar, if permitted. Grade is recorded as withdrawal (W).****	For compelling reasons only, upon successful petition to Academic Petitions Committee (file petition through dean's office). Grade recorded as withdrawal (W).****
Add course (regular credit or audit).	File form with registrar.	Permission of instructor, adviser, and dean required. File form with registrar.		
Change course section.	File form with registrar.	Permission of instructor and dean required. File form with registrar.		
Change from regular credit to audit.	File form with registrar. No grade recorded.		File form with registrar. Grade of W recorded and counted in 20-credit limit for withdrawal.	Not permitted.
Change from audit to regular credit.	File form with registrar.	Permission of instructor, adviser, and dean required. File form with registrar.		
Change from regular basis to pass-fail or reduce number of credits in course.	File form with registrar.		Not permitted.	
Change from pass-fail to regular basis.	File form with registrar.	Not permitted.		
Register late.	File form with registrar.	File form with registrar. Pay late-registration fee.	For compelling reasons only, upon successful petition to Academic Petitions Committee (file petition through dean's office). Pay late-registration fee.	
Withdraw from university. (See regulation G.)	Obtain form from Student Advisory Serv., then file it in academic dean's office. No grade recorded.		Obtain form from Student Advisory Serv., then file it in academic dean's office. Grade recorded as withdrawal (WU).****	For compelling reasons only; complete medical withdrawal or petition Academic Petitions Committee (file petition through dean's office). Grade recorded as withdrawal (WU).****
Change in undergraduate curriculum or major. (Consult the graduate bulletin for procedures applicable to graduate students.)	Anytime. File form with registrar. The request to change must be approved by the dean of the college in which the new curriculum is offered. If the new curriculum is in a different college, students must meet the admission requirements of that college. Students must also see the dean of the college they are transferring out of for counseling and information purposes (not for permission to transfer). A cumulative grade point average of 2.00 or better is normally required to transfer from one UI college to another; however, any student may transfer to the General Studies Program by consulting the director of the program (the signatures in this case are only to certify that the student's academic records have been forwarded). The change of curriculum is official when the student files the completed form with the registrar.			

*In the case of accelerated or short courses, when no more than 12.5 percent of the class-meeting hours have been completed.

**In the case of accelerated or short courses, after 12.5 percent but less than 60 percent of the class-meeting hours have been completed.

***In the case of accelerated or short courses, after 60 percent of the class-meeting hours have been completed.

****In the College of Law, consult the dean's office for information concerning grades assigned when students withdraw from law courses after the second week of classes.

D-2-d. Full-Time Employees. A full-time UI employee may register for no more than six credits in a semester or three credits in an eight-week period. Written approval by the employee's departmental administrator and dean or director must accompany the registration form.

D-2-e. Nonmatriculated Students. Nonmatriculated students are subject to the limitations stated in D-2-a and D-2-b. In addition, a nonmatriculated student who has been registered for 12 or more credits in each of two semesters must petition the Admissions Committee for permission to register for 12 or more credits while continuing as a nonmatriculated student.

D-3. Transfer Credit. Credit is accepted for work completed in accredited institutions of higher education as provided in the regulations covering the admission of transfer students. (See "Applicants with Previous College Credit" in part 2; also see E-4 and J-5.)

D-4. Challenged Courses (Credit by Examination). Degree-seeking students may challenge UI lecture and associated laboratory courses—earn credit by examination—as follows:

D-4-a. No examinations under this regulation may be conducted during the last two weeks of any academic session.

D-4-b. Students are not permitted to challenge a prerequisite course after having completed the advanced course. (See I.)

D-4-c. Credit in courses offered by the College of Law may not be obtained by this procedure.

D-4-d. Students must submit evidence to the instructor that they have sufficient knowledge to challenge a course. After a student has been granted permission to challenge a course by the instructor, by the administrator of the department in which the course is offered, and by his or her academic dean, the extramural-credit fee is paid and the complete petition is filed with the registrar. The registrar checks the student's record and, if the student is eligible to take the advanced-credit examination, notifies the instructor to proceed with the examination.

D-4-e. Undergraduates must score C or higher to pass and obtain credit. Graduates must score B or A to pass and obtain credit. A passing grade is entered as P and is not included in grade-point computations. If students do not meet these standards, no entry is made on their records.

D-4-f. Results of the challenged courses must be forwarded to the registrar no later than the beginning of the last week of the semester. In the case of graduate students, the results are sent to the registrar via the chair of the student's major department and the dean of the College of Graduate Studies.

D-5. Review and Prerequisite Courses. Students will not receive credit for courses taken in review or for courses that are prerequisites of courses they have already completed, except as stated in I-1.

D-6. Continuing Education Unit. Learning activities for which regular university-level credits are not awarded may be evaluated by a system of uniform continuing education units. Such units are granted in accordance with the following guidelines, which are set forth by the (national) Task Force on the Continuing Unit: A continuing education unit is expected to require 10 contact hours of participation in an organized continuing education experience under responsible sponsorship, capable direction, and qualified instructors. Continuing education, as used in this definition, includes all instructional and organizational learning experiences in organized formats that impart noncredit education to post-secondary-level learners. These properties of continuing education may be applied equally under the system regardless of the teaching-learning format, program duration, source of sponsorship, subject matter, level, audience, or purpose. The number of units to be awarded is determined by considering the number of contact hours of instruction, or the equivalent, included in the educational activity. Reasonable allowance may be made for activities such as required reports, lab assignments, field trips, and supervised study.

E—Grades

E-1. Grading System.

E-1-a. For purposes of reporting and record, academic work is graded as follows: **A**-superior; **B**-above average; **C**-average; **D**-below average; **F**-failure; **I**-incomplete work of passing quality (see regulation F); **W**-withdrawal; **WU**-withdrawal from the university; **P**-pass (see below); **IP**-in progress (see E-2); **N**-unsatisfactory and must be repeated (used only in Eng 101, 103, and 104).

E-1-b. Grades of P may be reported at the option of the department on a course-by-course basis in noncompetitive courses such as practicum, internship, seminar, and directed study. Grades of P are also reported in courses carrying the statement, "Graded P/F," in the course description. In courses in which Ps are to be used, the method of grading will be made known to the students at the beginning of the semester, and the grading system will be uniform for all students in the courses, except as provided in B-4-b. Grades under the pass-fail option are not affected by this regulation because the conversion of the regular letter grade is made by the registrar after instructors turn in the class rosters.

E-1-c. Midsemester grades in undergraduate courses must also conform to the above regulations. It is permissible to report Ps at midsemester ONLY in courses that have been approved for grading on this basis.

E-2. IP Grades.

E-2-a. Grades in Undergraduate Senior Thesis or Senior Project. The grade of IP (in progress) may be used to indicate at least minimally satisfactory progress in undergraduate courses such as senior thesis or senior project that have the statement "May be graded IP" in the course description. When the thesis or project is accepted, the IP grades are to be removed (see E-2-c). Grades of IP in undergraduate courses are considered to represent grades of at least C or P. If, in any given semester, the instructor considers the student's progress unsatisfactory, an appropriate letter grade (D or F) should be assigned for that semester.

E-2-b. Grades in Graduate Research Courses. The grade of IP (in progress) may be used in courses 500 (Master's Research and Thesis), 599 (Research), and 600 (Doctoral Research and Dissertation). When the thesis, dissertation, or other research document is accepted, or when a student ceases to work under the faculty member who is supervising his or her research, the IP grades are to be removed (see below). Grades of IP in graduate courses are considered to represent at least grades of B or P. If, in any given semester, the faculty member supervising the student's research considers the student's progress unsatisfactory, a regular letter grade (C, D, or F) should be assigned.

E-2-c. Removal of IP Grades. Departments may use on a department-wide basis either the P/F grading system, or regular letter grades, as well as P, when removing the previously assigned IP grades (e.g., a student who enrolled for six credits in course 500 one semester, four credits another semester, and five credits an additional semester could have 15 credits of IP grades removed with different grades for each of the blocks of credit registered for each semester, such as six credits of A, four credits of B, and five credits of P).

E-3. Grades in Law Courses. For additional provisions applicable to grades in law courses, see the College of Law section in part 4.

E-4. Computing Grade-Point Averages. Grades are converted by assigning the following number of points per credit for each grade: A-4, B-3, C-2, D-1, F-0. In computing the grade-point average, nei-

ther credits attempted nor grade points earned are considered for the following: courses graded I, IP, P, W, WU, or N, correspondence courses, advanced placement credit, credit by examination, or courses taken at another institution before initial enrollment at UI. Credits attempted and grades received at another recognized institution subsequent to regular enrollment at UI for at least one semester or summer session are included in the computation; in particular, when a course in which the student has received a D or an F at UI is repeated at another institution both the UI grade and the grade from the other institution are included in the computation. Credit earned at non-U.S. institutions is recorded as pass (P) or fail (F) and affects grade-point calculations accordingly. "Regular enrollment" does not include enrollment as a nonmatriculated student.

E-5. Raising a Grade by Repeating a Course. A student who has received a D or F in a course at UI or elsewhere may repeat the course at UI in an effort to raise the grade, provided a more advanced course for which the first course is a prerequisite has not been completed in the meantime. Although all grades remain on the record, only the most recent grade is counted for grade-point purposes. (See the College of Law section in part 4 for the exception to this regulation applicable to students in that college.)

E-6. Reports of Grades and Grade Changes. Grades are reported to the registrar for all courses at the end of each academic session and at midsemester for undergraduate courses (see deadlines in the academic calendar). Students are furnished copies of grade reports. The assignment of grades and changes in grades are the sole prerogative of the instructor and are reported by the instructor directly to the Registrar's Office on forms provided by that office. With respect to grade changes, an instructor may only change a grade to a new grade that he or she could have assigned initially. After a grade has been reported to the registrar, it may not be altered except by a written request stating the reasons for the alteration, signed by the instructor who submitted the original grade. If it is determined that a grade change is warranted and the instructor cannot be reached, the departmental administrator may assume the prerogatives of the instructor in connection with the grade change.

F—Grades of "Incomplete"

F-1. A grade of "Incomplete" is assigned only when the student has been in attendance and has done satisfactory work up to a time within three weeks of the close of the semester, or within one week of the close of the summer session. It may be assigned in the case of withdrawal from UI only if the withdrawal occurs within the last three weeks of the semester. If a final grade of "Incomplete" is recorded, the instructor specifies in writing on the class roster what the student must do to make up the deficiency. The instructor also specifies the grade that is to be entered on the student's record in the event that the incomplete work is not made up by the deadline.

F-2. Removal of "Incomplete" Grades. Incomplete work should be made up within six weeks after the first day of classes of the following academic semester (not including summer session). A grade of "Incomplete" that is not removed before that date automatically converts to the grade specified by the instructor on the class roster (see F-1) unless the student previously has filed with the registrar a "Permit for Extension of Time" card, signed by his or her academic dean and the instructor concerned. If the "Incomplete" grade is not removed within the six-week period, the period may be extended once for not more than one calendar year from the date such extension is approved. If an extension is granted and the work is not made up before the expiration date, the grade automatically reverts to the grade specified by the instructor on the class roster. It is the student's responsibility to see that the incomplete work is made up before the expiration date. The instructor must submit a "Removal of Incomplete" card to the registrar within 72 hours following the expiration date. In some cases, a student's eligibility to reregister is contingent on removal of "Incomplete" grades. In such cases, an extension of time for removal of the grades may not be granted. Moreover, if a student becomes academically disqualified (see L) when an "Incomplete" grade is removed, his or her registration may be cancelled. [See E-6 for further discussion on conditions for grade changes.]

F-3. "Incomplete" Grades on Record at End of Final Term. A student cannot graduate with a grade of "Incomplete" on his or her record. At the end of the term in which the student applies for a degree, a grade of "Incomplete" in any UI course reverts to the grade that the instructor had specified on the class roster (see F-1). Reverted grades that replace grades of "Incomplete" at the end of the final term are included in the computation of the student's cumulative grade-point average at graduation. Nonetheless, a student who has graduated may make up the incomplete work within the usual time limit in an effort to raise the grade on the permanent record.

G—Withdrawal Procedures.

G-1. Standard Withdrawal Procedures.

G-1-a. A student who wishes to withdraw from UI before the end of the second week following midterms must go to Student Advisory Services (241 UCC) where the process of withdrawal is started and further instructions will be furnished for completing the indefinite-leave-of-absence card. The date on which the card is filed in the office of the student's academic dean is the official date of withdrawal. Deans will not accept indefinite-leave-of-absence cards after the end of the second week following midterms.

G-1-b. A student is permitted to withdraw from UI after the end of the second week following midterms for compelling reasons only and after approval by the Academic Petitions Committee or after completing a medical withdrawal as explained in G-2. Examples of compelling reasons are: serious illness or injury of the student or death or serious illness or injury in the student's immediate family. Petitions for permission to withdraw after the end of the second week following midterms are forwarded *via the student's academic dean* to the Academic Petitions Committee on forms available in department and college offices. If the student's petition is approved, the Academic Petitions Committee will determine the effective date of the withdrawal. (See "Refund of Fees" in part 2.)

G-2. Medical Withdrawal Procedures.

G-2-a. The director of the Student Health Service is authorized to grant or require a student's withdrawal from UI for medical reasons.

G-2-b. Voluntary Medical Withdrawal. Students desiring to withdraw from UI for medical reasons will consult the director of the Student Health Service who will evaluate the request. If granted, the dean for student advisory services will be notified in writing to process the medical withdrawal.

G-2-c. Emergency Transfer to Institutional Care. The director of the Student Health Service is authorized to act as the representative of the president in emergencies that, under Idaho laws, require the transfer of a student to a community or state health facility. The student may be granted a medical withdrawal from UI at the discretion of the director.

G-2-d. Mandatory Medical Withdrawal. It is the responsibility of the dean for student advisory services to order a medical examination of a student if the dean has reason to believe that the student has a serious medical or psychiatric disability that substantially threatens or interferes with the welfare of the student, other members of the university community, or the educational processes of the university. The dean notifies the student and the director of the Student Health Service that such an evaluation is to be conducted. This process may be started by the director of the Student Health Service for patients under care or counseling by notifying the student and the dean for student advisory services in writing.

(1) Request for Evaluation. On notification from the dean for student advisory services, the director of the Student Health Service requests the student to undergo immediate professional evaluation by the director or the director's designee, or, at the student's request and expense, by a private physician or psychiatrist deemed appropriate by the director. A report of this evaluation is presented to the director with a specific recommendation as to whether a medical withdrawal is warranted.

(2) Evaluation Conference. The director of the Student Health Service provides the student written notice of a time and place at which the director and student will confer on the final determination as to mandatory withdrawal. The student may have the assistance of a representative at this conference. The director refers to reports, recommendations, and evaluations pertinent to the case and is empowered to request additional relevant medical or psychiatric examinations of the student.

(3) Determination of Director. Based on the evaluation and the conference, the director of the Student Health Service may determine: **(a)** that mandatory withdrawal is warranted by the student's medical or psychiatric condition; **(b)** that mandatory withdrawal **is not** warranted by the student's medical or psychiatric condition; or **(c)** that the student may remain enrolled subject to conditions specified by the director. The director transmits this decision in writing to the student and the dean for student advisory services. If withdrawal is ordered, the dean will process it.

(4) Finality of Determination. Decisions made by the director of the Student Health Service pursuant to these procedures are final.

(5) Refusal of Evaluation. If, after a request by the director of the Student Health Service, the student refuses to consult with a physician or psychiatrist, the director will, if practicable, seek the help of the student's family in persuading the student to seek appropriate professional assistance. Should these efforts not result in the student taking the desired action, the director summarizes the steps taken to secure needed information and the reasons for the withdrawal and instruct the dean for student advisory services to process the withdrawal. A copy of this order for withdrawal is sent to the student. The dean will process the withdrawal as mandatory, but involuntary.

(6) Appeal. A student may appeal to the coordinator of student services either (a) to revoke the order of the dean for student advisory services for a medical examination or (b) in case a procedural error is alleged, to order the determination of the director of the Student Health Service reopened.

G-2-e. Any student placed on medical withdrawal may, if appropriate, be informed, in writing, by the director of the Student Health Service, that he or she is eligible to return to UI at a later date on the favorable recommendation of the director. When applying for readmission, the student is responsible for providing the director with evidence of satisfactory treatment of the condition that necessitated medical withdrawal. Medical withdrawals are subject to the same refund rules and procedures as other withdrawals (see "Refund of Fees" in part 2).

G-3. Grades for Students Who Withdraw. Grades for a student who withdraws are recorded as provided in C and F-1. A student who withdraws from, or leaves, UI without official approval will receive Fs in all courses in which he or she is registered and for which the grade has not already been assigned.

H—Final Examinations

H-1. The last five days of each semester are scheduled as a final exam week (two-hour exams) in all divisions except the College of Law. The following provisions apply:

H-1-a. No quizzes or exams may be given in lecture-recitation periods during the week before finals week. Exams in lab periods and in physical education activity classes, final in-class essays in English composition classes, and final oral presentations in speech classes are permitted.

H-1-b. Instructors must meet their classes during the exam period for which they are scheduled in the finals week, either for an exam or for a final class session.

H-1-c. Final exams or final class sessions are to be held in accordance with the schedule approved by the Faculty Council and published in the Time Schedule. Instructors may deviate from the schedule only on the recommendation of the college dean and prior approval by the vice president for academic affairs and research.

H-1-d. Where exams common to more than one course or section are required, they must be scheduled through the Registrar's Office and are regularly held in the evening.

H-1-e. Students with more than two finals in one day are permitted, at their option, to have the excess final(s) rescheduled to the conflict period or at a time arranged with the instructor of the course.

H-1-f. Final grades for each course must be filed with the registrar within 72 hours after its scheduled exam period.

H-1-g. Athletic contests are not to be scheduled during finals week; further, if a change in the calendar causes a scheduled athletic contest to fall within finals week, every reasonable effort must be made to reschedule the athletic contest.

H-2. Students who miss final exams without valid reason receive Fs in the exams. Students who are unavoidably absent from final exams are required to present evidence in writing to the instructor to prove that the absence was unavoidable.

H-3. Instructors, with the concurrence of their departments, may excuse individual students from final exams when such students have a grade average in the course that will not be affected by the outcome of the final exam. In such instances, the grade earned before the final exam is to be assigned as the final grade.

H-4. Early final exams are permitted for students, on an individual basis, who clearly demonstrate in writing that the reasons for early final exams are compelling (such requests require approval by the instructor and by the administrator of the department and the dean of the college in which the course is offered).

I—Advanced Placement for Undergraduates

(NOTE: See part 2 for special fee for extramural credits.)

I-1. With prior approval by the administrator of the department concerned, undergraduate degree-seeking students may bypass an elementary course and enroll in a higher vertically related course. When subject mastery of the bypassed course is regarded by the department to be essential to the understanding of the advanced course, the student with a C or better in the advanced course is eligible to receive credit and a P for any bypassed courses in the same subject-matter area. The necessary forms must be filled out and forwarded by the department concerned. *Advisers should make sure that students are aware of this opportunity for obtaining advanced-placement credit.*

I-2. Students who have completed courses at other institutions after bypassing lower vertically related courses, but have not been awarded advanced-placement credit, will be granted such credit on completion of a yet higher vertically related course at UI.

I-3. Credit is granted for advanced-placement courses completed in high school in which a rating of 5, 4, or 3 is attained in CEEB advanced-placement tests.

I-4. UI also grants credit for the successful completion of tests under the College Level Examination Program (CLEP), as approved for specific courses by UI departments, and for courses

completed at military schools, as recommended by the American Council on Education.

I-5. With the approval of the University Curriculum Committee's Subcommittee on External Study/Experience and payment of the applicable fees, undergraduates may be awarded lower-division and/or upper-division (100-499 series) credit in recognition of university-level knowledge or competence gained in situations outside of UI's jurisdiction (e.g., in business, industry, government, or community agencies, through travel or private study, or while studying at a proprietary institution). Petitions for such credit must be approved by the student's departmental administrator and academic dean, and must be supported by such evidence as is needed to provide a sound basis for evaluating the student's achievements. Credits granted under this regulation are recorded as "external study/experience" and a P is assigned. The applicability of credits earned through external study/experience toward the satisfaction of specific degree requirements will be determined by the department and division through which the degree is to be granted. (See J-5.) Petition forms for external study/experience are available from the director of summer session.

I-6. Advanced-placement credit granted by other accredited institutions will be honored on transfer to UI.

I-7. A statement on all forms of advanced placement can be obtained from the Admissions Office.

J—General Requirements for Baccalaureate Degrees

Candidates for baccalaureate degrees must fulfill the following requirements. (See the Graduate Bulletin for the requirements for graduate degrees. See the College of Law section in part 4 for the requirements for the degree of Juris Doctor.)

J-1. Credit Requirements. For the minimum number of credits required in each degree program, see the major curricula of the various degree-granting units in part 5. A minimum of 36 credits in courses numbered 300 or above is required for a baccalaureate degree.

J-2. UI Course Requirements.

J-2-a. After a student has completed 88 credits (120 credits in the case of a student working toward the degree of Bachelor of Architecture), he or she must complete a minimum of 32 credits in UI courses. No credits awarded for correspondence study, bypassed courses, credit by examination, College Level Examination Program (CLEP), external study/experience, or technical competence can be counted among these 32 UI credits. Exceptions to this requirement are stated below; exceptions are also made for study abroad and student exchange programs with prior approval by the student's academic dean.

J-2-b. Candidates for baccalaureate degrees at UI centers away from the Moscow campus and candidates whose curricula specifically require the completion of courses offered by institutions other than UI are exempt from the requirement stated in J-2-a. Instead, they must complete a minimum of 32 of the last 64 credits in UI courses other than those offered by correspondence study.

J-2-c. Candidates for the B.S.Ed. degree in trade and industrial/technical education are exempt from the requirement stated in J-2-a; instead, they must complete a minimum of 64 credits in UI courses other than those offered by correspondence study.

J-3. Subject Requirements (Core Curriculum). A university education is a preparation both for living and for making a living. It offers an opportunity not only to lay the foundations of a career, but also to develop the mind to its highest potential, to cultivate the imagination as well as the power to reason, and to gain the intellectual curiosity that makes education a life-long enterprise. A central component of this preparation is the requirement that a student working toward a baccalaureate degree must complete 30-32 credits of course work in the four categories described below. This requirement is to be satisfied by earning the minimum number of credits specified for each category. (Transfer students have two options for fulfilling this requirement; these are described under "Admission Requirements" in part 2 of this catalog—see paragraph 9 of "Applicants with Previous College Credit.") **Courses that have been approved for the fulfillment of the requirement in each category are listed below; students are advised to check with deans' offices for courses that may have been added after the publication of this catalog.** Generally, the approved courses are open to lower-division students and do not have prerequisites. Note: Though a given course may be listed under more than one category, it may be used to satisfy the requirement in only one category; remedial courses may not be used to satisfy any of this requirement. **Degree-seeking students must be enrolled in Math 050 or in a course that meets the core requirement in mathematical, statistical, and computer sciences and in Eng 103 or 104 in their first year in residence and in subsequent years until the core requirements in mathematical, statistical, and computer sciences and Eng 104 have been satisfied.**

J-3-a. Communication (5-7 cr). The purpose of this requirement is to develop the ability to organize one's thoughts, to express them simply and clearly, to observe the standards and conventions of language usage, and to suit tone to audience. The requirement is proficiency in written English equal to that needed for the completion of UI course Eng 104 and the completion of one additional course in this category. The following specific provisions apply to the English composition component:

(1) Students who attain a satisfactory score on the College Entrance Examination Board (CEEB) English Achievement or Scholastic Aptitude (Verbal) Test, the American College Testing (ACT) English Test, or the Washington Pre-college Test (SAT Conversions) will be awarded credit and grades of P for Eng 103 and 104. Also, students who attain a grade of 4 or 5 on the objective portion of the CEEB Advanced Placement Program English Test and whose essay portion of that test is evaluated as satisfactory by the Department of English will be awarded credit and grades of P for Eng 103 and 104.

(2) Students who do not meet either of the conditions stated in paragraph (1) will be tentatively placed, on the basis of their scores on the tests cited above, in either Eng 103 or 104. These students will take a diagnostic test given by the Department of English and, on the basis of this test, will either (a) be required to take both Eng 103 and 104, (b) be given credit and a grade of P in Eng 103 and required to take Eng 104, or (c) be given credit and grades of P in Eng 103 and 104.

(3) Although UI accepts credits earned in comparable writing courses taken at other accredited institutions, students who have taken such courses but who have not met either of the conditions stated in paragraph (1) must take a test given by the Department of English to demonstrate that they have attained proficiency in composition equivalent to that required to complete Eng 104. Students who do not demonstrate that level of proficiency may attain the required proficiency through independent study or by taking UI courses. (See credit limitation in J-5-d.)

(4) Credits granted for Eng 103 are not applicable to the fulfillment of this requirement J-3-a.

CommG 131, Fundamentals of Public Speaking (2 cr)
Eng 205, Advanced Expository Writing (3 cr)
Eng 317, Technical and Engineering Report Writing (3 cr)
FL/FR 101, Elementary French (4 cr)
FL/GN 121, Elementary German (4 cr)
FL/GK 341, Elementary Greek (4 cr)
FL/LA 161, Elementary Latin (4 cr)
FL/SP 181, Elementary Spanish (4 cr)

J-3-b. Natural and Applied Science (8 cr). The purpose of this requirement is to develop a better understanding of the physical

and biological world by learning some of the principles that explain the natural phenomena of the universe, the experimental method used to derive those principles, and their applications.

Bact 250, General Microbiology (4 cr)
Biol 100, Introduction to Biology (4 cr)
Biol 201, Introduction to the Life Sciences (4 cr)
Chem 101, Chemistry and the Citizen (4 cr)
Chem 103, Introduction to Chemistry (4 cr)
Chem 111, Principles of Chemistry (4 cr)
Chem 112, Inorganic Chemistry and Qualitative Analysis (5 cr)
Chem 114, General Chemistry (4 cr)
Ent 211, General Entomology (4 cr)
Geog 100, 101, Physical Geography and Lab (4 cr)*
Geol 101, 102, Physical Geology and Lab (4 cr)*
Geol 106, 107, Historical Geology and Lab (4 cr)*
Phys 101, Fundamentals of Physics (4 cr)
Phys 113, 115, General Physics and Lab (4 cr)*
Phys 210, 212, Engineering Physics I and Lab (4 cr)*

*To be counted toward satisfaction of this requirement, the full four credits (that is, both the lecture course and the accompanying laboratory course) must be completed.

J-3-c. Mathematical, Statistical, and Computer Sciences (3 cr). The purpose of this requirement is to develop logical reasoning processes; skills in the use of numbers, space, symbols, and formulas; and the ability to apply these skills to realistic problems.

CS 100, Introduction to Computers and Programming (3 cr)
CS 112, Introduction to Problem Solving and Programming (3 cr)
Math 101, The Spirit of Mathematics (3 cr)
Math 111, Finite Mathematics (4 cr)
Math 140, Pre-calculus Algebra and Analytic Geometry (3 cr)
Math 160, Survey of Calculus (4 cr)
Math 180, Analytic Geometry and Calculus I (4 cr)
Stat 150, Introduction to Statistics (3 cr)
Stat 251, Principles of Statistics (3 cr)

J-3-d. Humanities and Social Sciences (14 cr, including at least 6 cr in humanities and 6 cr in social sciences). The purpose of this requirement is to explore the collective experience of mankind as it is reflected in literature, philosophy, the arts, and history, to develop an understanding of the inner workings of social processes and institutions, and to provide knowledge of how individuals develop and interact with society.

Humanities
AmSt 301, Interpreting America (4 cr)
Art 101, Visual Art (3 cr)
Eng 111 and/or 112, Literature of Western Civilization (3 cr each)
Inter 126, Film and International Culture (3 cr)
MusH 100, Survey of Music (3 cr)
Phil 101, Ethics (3 cr)
ThA 101, Introduction to the Theatre (3 cr)

Social Sciences
Anthr 100, Introduction to Anthropology (3 cr)
Econ 151 and/or 152, Principles of Economics (3 cr each)
Econ 272, Foundations of Economic Analysis (4 cr)
Geog 250, World Regional Geography (3 cr)
Hist 101 and/or 102, History of Civilization (3 cr each)
PolSc 105, Introduction to Political Science, or PolSc 101, Introduction to American Politics (3 cr)
Psych 100, Introduction to Psychology (3 cr)
Soc 110, Introduction to Sociology (3 cr)

J-4. Grade Requirements. To qualify for the baccalaureate degree, a candidate must have a cumulative grade-point average of 2.00 or better. See exceptions under E-4 and E-5.

J-5. Credit Limitations. A candidate may count toward a baccalaureate degree no more than:

J-5-a. Seventy credits earned at junior or community colleges, or one-half of the total credits required for a student's intended baccalaureate degree, whichever is the higher number.

J-5-b. Forty-eight credits in any combination of credits granted for courses taken at vocational-technical schools, external study/experience, technical competence, correspondence study, credit by examination, or advanced placement (such as CLEP, CEEB advanced-placement tests, courses completed at military schools, and credit for bypassed courses). This 48-credit limitation may be exceeded for good cause with the approval of the Academic Petitions Committee (file petition through dean's office). Note: credits earned through any combination of external study and technical competence cannot exceed a maximum of 32 of the allowable 48 credits.

J-5-c. Twelve credits earned under the pass-fail option (see B-11).

J-5-d. Six credits in English composition.

J-5-e. Six credits in remedial-level courses; to be counted, these credits must have been earned before the fall semester 1983; no such credits earned after summer session 1983 may be counted.

J-6. Assignment of Curricular Requirements (Catalog Issue). In addition to fulfilling the general university requirements for degrees, candidates must satisfy the particular requirements specified for their curricula. The pertinent requirements are those contained in the UI catalog issue that was in effect at the time of or subsequent to the candidate's enrollment as a degree-seeking student at UI or another institution accredited by one of the regional agencies, such as the Northwest Association of Schools and Colleges. In any case, the catalog issue designated must have been in effect within seven years of the date on which the candidate is to receive the degree.

J-7. Second Baccalaureate Degree.

J-7-a. Students may concurrently pursue two different majors leading to two different baccalaureate degrees (e.g., B.A. and B.S.Ed.) from UI by working to fulfill the general university requirements for one degree and the departmental and college subject-matter requirements for each. For exceptions to this regulation, see notes with the curricula in general studies and general agriculture in part 5. Students who plan to pursue two degrees concurrently should develop a schedule of studies that combines the degree requirements and present it to the dean(s) of the college(s) concerned as early as possible, preferably before the end of the junior year.

J-7-b. Students who have earned a baccalaureate degree at UI and who wish to complete the requirements for a different major and receive a second baccalaureate degree must earn at least 16 credits in UI courses other than those offered by correspondence study after the receipt of the first degree and fulfill the departmental and college subject-matter requirements for the second degree. (See B-9.) Students may return to UI and earn a second degree carrying the same name as one previously granted by UI so long as the requirements for a different major are satisfied. For exceptions to this regulation, see notes with the curricula in general studies and general agriculture in part 5. This regulation does not apply to students who were concurrently pursuing two different degrees under regulation J-7-a.

J-7-c. Students who have a baccalaureate degree from another recognized institution and who wish to earn another baccalaureate degree at UI must earn a minimum of 32 credits in UI courses other than those offered by correspondence study after the receipt of the first degree and fulfill the departmental and college subject-matter requirements for the degree. (See B-9.)

J-8. Degree with Double Major. Students may complete two different majors (curricula) offered under a particular baccalaureate degree and have both majors shown on their academic records and diplomas, e.g., Bachelor of Arts with majors in history and political science. Each of the majors must lead to the same degree. When majors leading to different degrees are involved, see the requirements applicable to the awarding of a second baccalaureate degree (J-7).

J-9. Academic Minors.

J-9-a. An academic minor is a prescribed course of study consisting of 18 or more credits. For descriptions of minor curricula, see the programs of the degree-granting units in part 5. In the following paragraphs of J-9, "minor" denotes "academic minor," which is to be distinguished from "teaching minor"; for information on the latter, see the College of Education section of part 4.

J-9-b. A student may pursue one or more minors in addition to a major by filing with the registrar a declaration of intention to do so. Completion of a minor is required only if specified by the degree-granting unit, but any minor completed is recorded on the student's academic record.

J-9-c. Transfer credits may be applied to a minor with the approval of the department offering the minor; however, the last nine credits applied to completion of the minor must be earned in UI courses and may not include credits earned through correspondence study.

J-9-d. A student may complete an undergraduate minor even though he or she has already earned a baccalaureate degree. If the sole objective is to complete an undergraduate minor, the student normally registers as a major in the department offering the minor or as "undeclared" in the college in which the minor is offered. If the baccalaureate degree was earned at UI, the student must complete at least six additional UI credits that apply to the minor (these six credits may not include any earned through correspondence study). If the degree was earned elsewhere, the conditions stated in J-9-c apply.

K—Academic Honors

K-1. Graduation with Honors. Candidates for baccalaureate degrees are graduated with honors if their cumulative grade-point averages are as specified in K-1-a, K-1-b, or K-1-c and if they have earned at least 56 credits in UI courses. No credits earned through correspondence study, bypassed courses, credit by examination, College Level Examination Program, external study/experience, or technical competence may be counted among these 56 credits. With prior approval by the student's academic dean, credits earned in special programs, such as study abroad and student exchange programs, may be counted. Candidates for the degree of Juris Doctor are graduated with honors under the same conditions, except that at least 84 credits in law courses are required and the grade-point average considered is based exclusively on the student's record in the College of Law. Honors are not awarded with degrees earned through the College of Graduate Studies.

K-1-a. Candidates whose grade-point averages would place them within the top 3 percent of graduates from their respective colleges over the preceding five years are graduated *summa cum laude* (with highest distinction).

K-1-b. Candidates whose grade-point averages would place them within the top 6 percent (but below the top 3 percent) of graduates from their respective colleges over the preceding five years are graduated *magna cum laude* (with great distinction).

K-1-c. Candidates whose grade-point averages would place them within the top 10 percent (but below the top 6 percent) of graduates from their respective colleges over the preceding five years are graduated *cum laude* (with distinction).

K-2. Dean's List. Students who are carrying 14 credits (10 in the College of Law) and attain a grade-point average of 3.30 (3.00 in the College of Law) for a given semester are placed on lists prepared for the college deans. (Except for grades of P earned in Eng 103 and 104, credits for which a student was graded P are not computed in the specified minimums.) These lists are publicized within UI and are distributed to news agencies.

L—Academic Probation, Disqualification, and Reinstatement

L-1. Academic Probation for Undergraduates.

L-1-a. At the end of a semester, undergraduate students who do not attain the cumulative grade-point average required for their rank (see L-5) are placed on academic probation for the next semester of enrollment and are referred to the appropriate academic dean for advising. The effect of this probationary status is to serve notice that if a student's cumulative record at the end of the next semester in residence is unsatisfactory he or she will be disqualified and ineligible to continue at UI.

L-1-b. Students on academic probation who attain a cumulative grade-point average higher than the minimum required for their rank are automatically removed from probation.

L-1-c. Students on academic probation who attain a grade-point average of 2.00 or higher during the next or subsequent semester after being placed on probation, but whose cumulative grade-point average is still below the minimum required for their rank, remain on academic probation.

L-2. Disqualification for Undergraduates. Students on academic probation will be disqualified at the end of a probationary semester unless the minimum cumulative grade-point average required for their rank, or a semester grade-point average of at least 2.00, is attained. To reregister after being academically disqualified, students must be reinstated.

L-3. Reinstatement for Undergraduates.

L-3-a. After a disqualification, students may be reinstated (i.e., have their eligibility to continue restored) by petition to and favorable action by the college in which they are enrolled.

L-3-b. After a first disqualification, students may be automatically reinstated by remaining out of UI for at least one semester.

L-3-c. Students who have been reinstated may continue to be reinstated with the approval of the dean of the college in which they are enrolled so long as they attain a 2.00 or better grade-point average for each semester following the first disqualification.

L-3-d. Students who attend another institution while disqualified must meet the requirements applying to the admission of transfer students in order to reenter UI.

L-3-e. Students who are disqualified and reinstated are reinstated on academic probation.

L-4. Dean's Referral for Undergraduates. Students who attain a grade-point average below 1.50 during a given semester without dropping below the cumulative grade-point average required for their rank receive a dean's referral. Although this does not affect their eligibility to register, the students are referred to the appropriate academic dean for advising.

L-5. Academic Probation and Disqualification Cutoff by Rank for Undergraduates.

Rank (by Credits Earned)	Minimum Cumulative Grade-Point Average
0 through 32	1.60
33 through 64	1.80
65 and up	2.00

L-6. Registration Pending Removal of Incompletes for Undergraduates. Regulation F-2 provides that in cases where a student's eligibility to reregister is contingent on removal of incomplete grades, the student may not be granted an extension of time for such a removal.

L-7. Summer Session. Disqualification at the end of a spring semester does not affect a student's eligibility to continue in the immediately ensuing summer, but to register in any subsequent term the student must be reinstated.

L-8. This regulation L does not apply to law, graduate, or full-time nonmatriculated students.

M—Attendance, Repeated Absences, Field Trips, and Official Student Travel

M-1. Attendance. Students are responsible for class attendance; in all cases of absence, students are accountable for the work missed. In the case of officially approved absence and on the request of the student, the instructor is obligated to provide an opportunity for the student to make up for missed work. In general, an absence is considered "official" when the student is: (a) participating in an approved field trip or other official UI activity (e.g., ath-

letics, debate, music, or theatre arts); (b) confined in the Student Health Service; or (c) granted a leave of absence from UI for reasonable cause by his or her academic dean.

M-2. Repeated Absences. In courses where a substantial amount of the content can be mastered only or primarily through class participation, regular and punctual attendance is essential and may, therefore, be reflected in grading. Instructors will make clear at the beginning of each course the extent to which grades are dependent on attendance. Instructors may report to the registrar students who are repeatedly absent from classes (a form is available from departmental and college officials). Absences may be considered excessive when their number equals or exceeds the number of credits in a particular course.

M-3. Field Trips and Official Student Travel. "Field trip" is defined as any required, course-related student travel that exceeds 25 air miles from the campus or conflicts with other classes that the students involved are taking. (A trip taken within 25 air miles during the time scheduled for the particular class or at a time that does not conflict with other classes the students involved are taking is a "local trip," not a "field trip.")

M-3-a. Missed Class Work. Students participating in field trips, as defined above, or other official UI activities are responsible for conferring in advance with the instructors of any classes that will be missed in order to be eligible for making up missed class work. (See M-1.)

M-3-b. Approval of Course-Related Field Trips. Administrative approval for course-related field trips will be obtained by the person in charge of the trip as follows:

(1) Each field trip as identified in the catalog course description requires prior approval by the department in accordance with divisional procedures (application for approval should be made at least one week before the expected departure).

(2) Each field trip NOT identified in the catalog course description requires prior approval by the departmental administrator, the dean of the college, and the vice president for academic affairs and research (application for approval should be made at least two weeks before the expected departure).

M-3-c. Approval of Other Official Student Travel. Administrative approval for official student travel that is NOT course related is obtained from the coordinator of student services (application for approval should be made at least two weeks before the expected departure).

M-3-d. Costs. When a college can cover all or part of the cost of a course-related field trip from allocated funds, the college should do so. If the college cannot cover the cost, or a portion thereof, the cost (or remaining portion) must be borne in proportionate share by the students in the course. Students missing required field trips identified in the catalog course description must pay their proportionate shares.

M-3-e. Field-Trip Completion Deadline. All field trips and other UI-approved student travel must be completed before 7:30 a.m. on the fifth day of classes before the start of final examinations.

M-3-f. Unofficial Student Travel. UI student accident insurance does not cover injuries sustained in the course of travel unless the travel has been officially authorized by the appropriate UI agent.

M-3-g. Vehicle Information. Information concerning privately owned vehicles (registration, insurance, driver's license, etc.) to be used for field trips or other official student travel must be filed in the Controller's Office (Rm. 101, Ad. Office Bldg.). Administrators of departments and divisions are responsible for ensuring that the required information is filed before the initial use of each privately owned vehicle in a given academic year.

N—Class Rating

Class ratings of undergraduates are determined as follows: sophomore-26 credits, junior-58 credits, and senior-90 credits.

O—Miscellaneous

O-1. Credit Requirements for Full-Time Students.

O-1-a. For purposes other than fees, UI students in all divisions except the College of Graduate Studies must carry 12 credits each semester to be classified as full time.

O-1-b. For fee and tuition purposes only, students carrying eight or more credits (or equivalent in audits and zero-credit registrations) and all graduate/instructional assistants on full appointment, regardless of the number of credits they register for, are classified as full-time students.

O-1-c. Students in the College of Graduate Studies are considered full time: (1) when registered for nine credits (or equivalent) of course and/or thesis work; or (2) when on regular appointments as instructional assistants or graduate assistants.

O-1-d. Veterans and war orphans attending UI on the G.I. Bill must carry certain minimum credit loads to be considered by the Veterans' Administration for benefits as indicated in the table accompanying this regulation. (Audits do not count; repeats and reviews may be included when the student's adviser certifies that the course is required in the student's curriculum or is needed to remove a deficiency or to provide essential background for the student's program; file a copy of the program with the veterans' clerk at Student Advisory Services.)

O-1-e. During the eight-week summer session, students are considered full time for fee and other purposes when carrying six or more credits (or equivalent).

O-1-f. The president, vice president, and senators of the Associated Students University of Idaho are considered full time when paying full-time student fees and carrying at least the following credit loads: president, three credits; vice president and senators, six credits. The editor and associate editor of the Argonaut are considered full time when paying full-time student fees and carrying at least the following credit loads: editor, three credits; associate editor, six credits.

O-2. Academic Performance. Instructors and students are responsible for maintaining academic standards and integrity in their classes. An instructor may reduce a student's grade for dishonesty in a course, but the effect may not be greater than the proportionate value of the work involved to the total requirements. If the student deems the reduction of the grade unfair, he or she may appeal through the appropriate departmental administrator and college dean, and finally to the Academic Hearing Board. Disciplinary penalties for academic dishonesty must be handled by the Student Judicial System.

MINIMUM CREDIT LOADS FOR VETERANS' BENEFITS

Benefits	Academic Year Undergraduate	Academic Year Graduate	Summer Session Undergrad. & Grad.
Full	12 or more	9 or more	Must be
Three-fourths	9-11	6-8	arranged
Half	6-8	4-5	
Fees and tuition only	fewer than 6	fewer than 4	

O-3. Application for Degrees. Candidates for degrees must, at the beginning of the last semester or summer session in residence, pay the diploma fee and file an application with the dean of the division through which the degree is offered. If two degrees are to be received concurrently, separate applications must be filed with the dean(s) of the division(s) concerned. The application must be filed with the dean after the diploma fee has been paid at the Controller's Office. (See "Fees and Expenses" in part 2.) The last day for filing applications for baccalaureate degrees is the beginning of the third week of the semester or the beginning of the second week of summer session. The last day for filing applications for graduate degrees is the beginning of the fourth week of the semester or the beginning of the third week of summer session. If applications for degrees are transmitted by the dean to the registrar less than one month before the end of the academic session in which graduation requirements are completed, the applications will be held by the registrar and processed with those received at the beginning of the next academic session.

O-4. Commencement. Formal commencement exercises are held only at the close of the spring semester; however, diplomas are also issued at the close of the summer session and the fall semester to such candidates as have completed their graduation requirements at that time. All students who graduate in the summer, fall, or spring are entitled to participate in the annual commencement exercises. Candidates who DO NOT intend to participate in the formal commencement exercises must notify the dean of the division in which the degree program is offered before the close of the academic session in which graduation requirements are completed so that appropriate arrangements can be made. Reservations for caps, gowns, and hoods must be made by the date specified by the registrar. Diplomas are ready about five weeks after the end of the academic session in which graduation requirements are completed.

O-5. Limitations on Class Size.

O-5-a. Limitations on class size must have prior approval by the dean of the college in which the course is offered. If it becomes necessary to limit the size of a class on a continuing basis (more than two semesters), the limitations must be approved through faculty channels—University Curriculum Committee and university faculty—and be made part of the catalog description of the course.

O-5-b. Preference for enrollment in courses with limitations on class size is given to students enrolling in them for the first time. At the option of the department, students repeating courses for any reason may be placed on standby status. Students in that status are allowed to register for the course, if there is available space, by permission of the department offering the course. In no case may a student be held in standby status for any one course for more than two consecutive semesters.

O-5-c. Any student denied admission to a class may appeal in writing to the vice president for academic affairs and research for a review of the circumstances involved.

O-6. Students' Right to Change Course Sections. Students have the right to change from one section of a course for which they are qualified to another section of the same course during the first two weeks of classes so long as the section into which they wish to transfer has not reached the maximum number of students that may be accommodated. (See appeal procedure in O-5.)

O-7. Availability of Instructors' Names. As a matter of principle, students and their academic advisers and deans have the right to know the names of the instructors who will teach course sections to be offered during the immediately ensuing semester or summer session. Departments are required to submit the names of instructors for all course sections for publication in the Time Schedule. Where it is impossible to determine the teaching assignments of individual members of the instructional staff before the deadline for the Time Schedule, departments are responsible for making information concerning adjustments in teaching assignments generally available to students, advisers, and deans at such time as they occur.

O-8. Confidentiality of Academic and Counseling Records. See the student records policy in the Time Schedule.

O-9. Rights Reserved to the University.

O-9-a. Catalogs, bulletins, and course or fee schedules shall not be considered as binding contracts between UI and students. UI reserves the right at any time, without advance notice, to: **(1)** withdraw or cancel classes, courses, and programs; **(2)** change fee schedules; **(3)** change the academic calendar; **(4)** change admission and registration requirements; **(5)** change the regulations and requirements governing instruction in and graduation from UI and its various divisions; and **(6)** change any other regulations affecting students. Changes go into effect whenever the proper authorities so determine and apply not only to prospective students but also to those who are matriculated in UI. When economic and other conditions permit, UI tries to provide advance notice of such changes. In particular, when an instructional program is to be withdrawn, UI will make every reasonable effort to ensure that students who are within two years of completing graduation requirements, and who are making normal progress toward completion of those requirements, will have the opportunity to complete the program that is to be withdrawn.

O-9-b. UI also reserves the right, when a student has failed to discharge any obligation to UI, to deny that student the privilege of reregistering or to withhold the student's records or information based on the records. Students may verify the status of their accounts and be informed of any financial obligation to UI by inquiring at the cashier's window of the Controller's Office in the Administration Office Building.

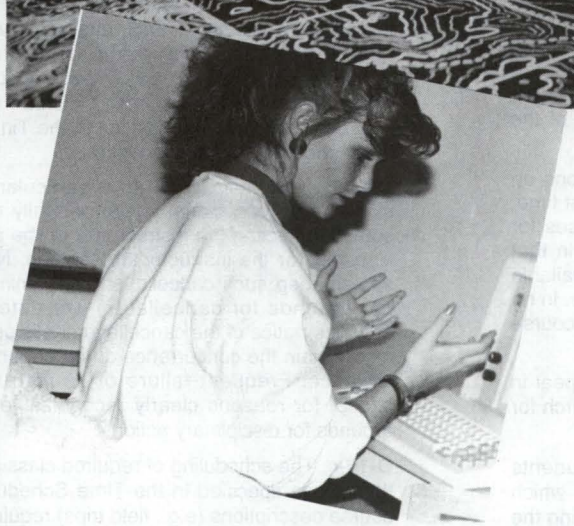
O-10. Deviations from Established Class Schedules.

O-10-a. The vice president for academic affairs and research periodically reminds deans and departmental administrators of their responsibility to ensure that classes meet in conformity with the course descriptions and Time Schedule. (It is the responsibility of the University Curriculum Committee to see that the time requirements stated in new or revised course descriptions satisfy general regulation D-1, "Credit Defined"; it is the responsibility of the registrar to see that listings in the Time Schedule conform to the respective course descriptions.)

O-10-b. The cancellation of a particular class session or sessions on an occasional basis, normally due to unusual circumstances affecting the instructor of or the students in the class, is a matter for the instructor's discretion. Nonetheless, instructors should keep such cancellations to a minimum, be satisfied that the grounds for cancellation are defensible, give as much advance notice of the cancellation as is possible, and, if time permits, obtain the concurrence of the departmental administrator in advance. Frequent failure of an instructor to meet classes, except for reasons clearly recognizable as adequate, may be grounds for disciplinary action.

O-10-c. The scheduling of required class meetings at times other than those specified in the Time Schedule or authorized in the course descriptions (e.g., field trips) requires approval by the vice president for academic affairs and research. In addition to securing the vice president's approval, the instructor must give the students at least two weeks' notice, provide alternative means of completing class requirements for students who have irreconcilable conflicts with the irregular meetings, and, normally, cancel regularly scheduled class meetings equivalent to the irregular meetings. (If it is proposed that such irregular meetings be made a continuing practice, they are to be incorporated in the course description and the revised description submitted to the University Curriculum Committee for routine faculty approval.)

O-10-d. Authorized class meetings at times other than those shown in the Time Schedule is one of the topics that instructors are to discuss at the first or second class session.



General Studies Program

Dene K. Thomas, Director (112 Admin. Bldg.).

The General Studies Program, in which students at any level of competence may enroll, serves students in two ways. General studies is elected by many students in order to explore various academic areas before deciding in which degree program they would enroll. Students who wish to major in general studies may develop, in consultation with their adviser, a coherent program of studies and work toward the degree of Bachelor of General Studies, as outlined below. Also, credits and grade points earned while a student is enrolled in the program may be applied toward any other degree for which they are applicable.

Admission to the Program

New students wishing to enroll in the General Studies Program may indicate their choice on the application form for admission to the university. Students who are undecided between two majors offered by any of the university's colleges should enroll as "undeclared" students in that college rather than in general studies. Students currently enrolled in one of the colleges of the university may transfer to the program by applying to the director.

General Regulations

So that students may have the greatest opportunity to explore various types of subject-matter areas, as well as different types of student programs, there are no requirements during the advisory phase. However, to graduate, a student must either declare as a candidate for the degree of Bachelor of General Studies or transfer to one of the colleges of the university. In either case, the student must fulfill all of the requirements for the degree, including achieving an overall grade-point average of 2.00 (C). Whether in the advisory phase or in the degree program, a student ineligible to be in or to continue in the College of Business and Economics may take no more than 16 credits of lower-division work and, except for real estate and insurance courses, no more than 9 credits of upper-division work in that college. Furthermore, students may not transfer from general studies to some of the university's colleges unless they have a grade-point average of at least 2.00.

Bachelor of General Studies Curriculum

The curriculum leading to the degree of Bachelor of General Studies is designed to provide maximum flexibility for undergraduates while planning their program of studies. Since the only specific subject requirements are the general university requirements, students can plan their programs to the best advantage of their particular educational objectives. This means that students must bear the major responsibility for their choice of courses. Those who plan wisely have the opportunity to obtain an excellent education. The key admonition is: Plan your program carefully.

The major thrust of the B.G.S. degree program is nonspecialized education. Although a student could take his or her work in a limited number of departments, the intent of this program is to permit great latitude in the choice of subjects so that students may satisfy their particular objectives. No student may become a candidate for the B.G.S. degree who has already earned a baccalaureate degree or who is a candidate for another degree offered by the university.

Major. No major other than "general studies" will be certified on the student's diploma or official transcript. Students who wish to have a designated major should pursue a departmental baccalaureate degree (B.A., B.S., etc.). Naturally, a student may select a combination of courses that will be the equivalent of a major, but this will not be officially recognized by the university as a major.

Degree Requirements. In addition to the general university requirements for the baccalaureate degree (see regulation J-3), sufficient electives must be taken to total 128 credits. *A minimum of 48 credits must be earned in courses numbered 300 and above.* Not more than 40 credits in any one subject field may be counted in the 128 credits. Candidates for the B.G.S. degree must register for and complete at least the last 16 credits applicable toward the degree after enrolling in the General Studies Program.

Suggestions to Students. Students are advised not to make a firm decision with respect to the B.G.S. degree before the end of the freshman year. During the freshman year, and probably during the sophomore year, students should consider following one of the curricula leading to a departmental baccalaureate degree, deviating from the departmental requirements only where it appears educationally advisable to do so.

It is very important that the student working toward the B.G.S. "look ahead" to see in which departments he or she wishes to accumulate the required 48 credits in upper-division courses (those numbered 300 and above). Many of these courses have prerequisites that must be completed during the early semesters of the student's undergraduate career. If planning is delayed, it may be that some courses will be "unavailable" because the student has not taken the prerequisites.

College of Agriculture

A. Larry Branen, Dean (53 Iddings Wing, Ag. Sc. Bldg.; A. J. Lingg, Associate Dean and Director of Academic Programs; LeRoy D. Luft, Associate Dean and Director of the Cooperative Extension System; Gary A. Lee, Associate Dean and Director of the Agricultural Experiment Station.

The College of Agriculture is a part of the land-grant university system. Pursuant to federal and state legislation, the College of Agriculture was established as a division of the university to provide academic programs in agriculture, to conduct research in all fields of agriculture that promise to assist in the development of state resources, and to extend the results of research and education to all parts of the state.

Standing and Advantages

The Residence Instruction Section of the Division of Agriculture of the National Association of State Universities and Land-Grant Colleges, through its Committee on Organization and Policy, maintains close liaison with all colleges of agriculture in the land-grant college system. In annual national and regional meetings and summer workshops, efforts are coordinated to meet the changing needs of agriculture and maintain high professional standards for educating students in the array of disciplines that constitute modern agriculture.

Students in the College of Agriculture are encouraged to pursue a broad education. In each curriculum, minimum requirements are specified in agriculture or home economics, in the life, physical, and social sciences, and in humanities to qualify the graduate to enter professional fields in agriculture. At the same time, each curriculum permits students to choose elective courses that will assist in personal and professional growth, development of communication skills, and a better understanding of the world in which we live.

Facilities of the College

The facilities for on-campus agricultural instruction consist of the Agricultural Science Building, used as a central office, classroom, and laboratory building; Food Research Center; the Home Economics Building and adjacent Management House; Dairy Science Center; offices and laboratories in the Life Science Building, Agricultural Engineering Buildings, Holm Veterinary Science Building, and Disease Research Barn; greenhouses; H.C. Manis Entomology Research Unit; dairy cattle, beef cattle, sheep, and swine barns, Meats Laboratory, Judging Pavilion, and plant science farm and research plots. Dairy cattle, beef cattle, and sheep representing several breeds are maintained for instructional and research purposes.

The College of Agriculture and the Agricultural Experiment Station at Moscow operate more than 1,100 acres of land. Additional lands, including 1,380 acres in other parts of the state, are used for instructional purposes in breeding, production, and applying scientific principles to all fields of agriculture.

Agricultural Experiment Station

The Idaho Agricultural Experiment Station was established in 1892 as the research branch of the College of Agriculture and has the responsibility to conduct applied and basic investigations leading to problem solving and new knowledge in agricultural industries, rural communities, and family living. The Idaho Agricultural Experiment Station is coordinated with teaching and extension in the college to more effectively meet the needs of Idaho citizens.

The Idaho Agricultural Experiment Station is composed of all departments of the college. Thus, most of the college's teaching faculty also have partial research appointments in the experiment station. Some faculty members have combined extension and research appointments and some are assigned to full-time research.

The Idaho agricultural research program is statewide. Research is conducted in a number of areas related to agriculture and on all major agricultural commodities. The center for the research program is located on the Moscow campus. In addition, there are six research and extension centers in strategic agricultural areas around the state where resident research and extension personnel are located.

The Idaho Agricultural Experiment Station shares the responsibility of developing and training future scientists through graduate assistantship programs. Currently there are approximately 180 graduate students enrolled in the College of Agriculture, most of whom are on assistantships or partial stipends. These appointments are generally for two years at the Master of Science level and for three years in Ph.D. programs during which time the students conduct research as a part of their graduate training.

Cooperative Extension System

The Cooperative Extension system was first established by the Smith-Lever Act, signed May 8, 1914, to help the people of the United States improve their farms, homes, and communities. The Idaho legislature approved the cooperative extension concept in 1915. In 1917, additional state legislation brought the county boards of commissioners into the three-way federal, state, and county partnership.

Cooperative Extension is an integral part of the College of Agriculture and is administratively coordinated with the teaching and research functions of the college. The extension function is organized to extend the knowledge created through research to the people of the state of Idaho so that they can apply the findings to their particular situations, thereby improving their quality of life.

The headquarters of Cooperative Extension is at Moscow. District offices are located at Moscow, Caldwell, Twin Falls, and Idaho Falls.

Agricultural and home economics agents are located in 42 of Idaho's 44 counties. Area agents and/or specialists are headquartered in Idaho Falls, Parma, Caldwell, Aberdeen, Sandpoint, Soda Springs, Twin Falls, Moscow, and Coeur d'Alene and work in several adjoining counties.

Agents live and work in the areas to which they are assigned by mutual agreement of the university and the counties involved. Backstopping the agents are state extension specialists located throughout the state. These specialists, in turn, keep up to date by cooperating with research scientists of the College of Agriculture and the U.S. Department of Agriculture.

Educational programs in cooperative extension work are conducted in four broad areas. These are: (1) agriculture and natural resources, (2) home economics, (3) 4-H, youth development, and (4) rural development. Programs are both disciplinary and interdisciplinary and are designed to address the issues facing Idahoans.

The primary objective of Idaho Cooperative Extension is to make Idaho a satisfying and desirable state in which to live, work, raise families, and enjoy a high quality of life. To accomplish this objective, the extension service works under the basic philosophy that programs planned with people will achieve greater success than those planned for them. Extension takes the resources and philosophy of the land-grant university out into the state so that Idaho's citizens can benefit from their university.

Degrees and Curricula Offered

Undergraduate. Baccalaureate degrees and major curricula offered by the College of Agriculture are the Bachelor of Science in General Agriculture, Bachelor of Science in Agricultural Education, Bachelor of Science in Agricultural Economics (majors in agribusiness, agricultural economics, and natural resources and rural development), Bachelor of Science in Agricultural Mechanization, Bachelor of Science in Animal Sciences (majors in agribusiness, animal science, poultry science, and range-livestock management), Bachelor of Science in Bacteriology, Bachelor of Science in Entomology, Bachelor of Science in Home Economics (majors in child development and family relations; clothing, textiles, and design; food and nutrition; general home economics; and home economics education), Bachelor of Science in Plant Protection, Bachelor of Science in Plant Science (majors in crop management, crop science, horticultural science, and landscape horticulture), Bachelor of Science in Soil Science, and Bachelor of Science in Veterinary Science. Also, programs in food science are offered in cooperation with Oregon State University and Washington State University (the degree is granted by those institutions). See part 5 for the programs of study leading to these degrees.

Graduate. Graduate study leading to the degree of Master of Science is offered in agricultural economics, agricultural education, animal science, bacteriology, biochemistry, entomology, home economics, plant science, soil science, and veterinary science. Graduate study leading to the degree of Doctor of Philosophy is offered in animal physiology, bacteriology, biochemistry, entomology, plant science, and soil science. Students must fulfill the requirements of the College of Graduate Studies and the departments in which they study. Consult the Graduate Bulletin for further information.

General Requirements for Graduation

University Requirements. See regulation J in part 3 for requirements that all students in the university must meet.

College Requirements. See part 5 for specific degree requirements within each department.

Major Curricula

The specific requirements for the undergraduate majors are listed in part 5. Each student is assigned an adviser who assists in the planning of his or her program; however, the student has the final responsibility for the completion of all university, college, and departmental requirements.

College of Art and Architecture

George M. Simmons, Dean (Art and Arch. Library Bldg.).

The College of Art and Architecture was established in 1981 to bring together disciplines that deal with creation of the visual and physical human environment. The specific disciplines are art, architecture, landscape architecture, and interior planning and design. This combination not only increases the resources available to students, but also brings together a community of creative scholars

with a common dedication to the arts. The quality of these programs has earned the college an excellent and widespread reputation.

The objective of the College of Art and Architecture is to provide an educational experience for qualified students in the design-related disciplines. Upon completion of a program in one of these disciplines, a person should develop into a professionally competent citizen, capable of making useful and valuable contributions to society. The range of these contributions varies greatly, as do the fields contained within the college.

Aptitudes

Students likely to succeed in the design fields are those with a serious purpose, willing to consistently work hard. Equally important are: (1) ability to visualize in three dimensions; (2) ability to be creative and inquisitive; (3) facility in the use of written and spoken English; and (4) possession of personal attributes that enable one to inspire associates and assistants to work together effectively.

Faculty

The faculty is the key to the quality of the educational experience obtained through the college programs. Combining the energies of a well recognized, creative faculty with the innovative talents of experienced architects, designers, and artists, the college develops the skills of future professionals by preserving the balance between the theoretical and practical aspects in each of the programs represented. Within the design professions focus is placed on the application of modern design techniques, with an understanding of their historical development.

Facilities

The College of Art and Architecture is housed in four buildings which are located in the very center of the university campus. These buildings are all in close proximity, and well placed in relationship to university classroom buildings, library, administrative offices, and recreational facilities. The Ridenbaugh Hall Gallery on campus and the Prichard Gallery in downtown Moscow are administered by the college and provide support to all college disciplines.

Departments

There are three departments in the college: Architecture, Art, and Landscape Architecture. An interior design program is offered through the Department of Architecture. Although these departments are separate entities, the teaching, research, and service missions of all the departments are integrated and coordinated at the college level. The program of a student whose major is in one of the departments will include courses in the other departments.

Fees

Students in the College of Art and Architecture pay a general fee and special fees for certain courses. See "Fees and Expenses" in part 2 of this catalog.

Preparation and Admission

A statement of admission requirements is included in part 2. A student may be admitted with less than the requirements listed, but the deficiency must be made up before he or she can progress very far in the College of Art and Architecture courses of study.

Students who contemplate entering the College of Art and Architecture with advanced standing from a junior college or other institution should complete as many of the freshman and sophomore requirements listed in the curricula as possible. Certain courses are prerequisites to many advanced courses, and their omission will delay graduation. Certain grade-point averages and other conditions are required for entering into particular programs in the college. See the preface to each curriculum.

Degrees

Curricula leading to the following degrees are offered by the college: Bachelor of Architecture (B.Arch.), Bachelor of Fine Arts (B.F.A.), Bachelor of Science in Art Education (B.S.Art Ed.), and Bachelor of Landscape Architecture (B.L.Arch.). In addition, a Bachelor of Arts degree (B.A.), with a major in art, is available through the College of Letters and Science. The majority of courses taken in the B.A. curriculum are housed within the College of Art and Architecture. Both the B.A. and B.F.A. degrees in art are available with eight areas of emphasis: drawing, painting, ceramics, sculpture, textile design, printmaking, graphic design, and jewelry. Graduate degrees are offered in the following areas: Master of Architecture (M.Arch.), Master of Fine Arts (M.F.A.), Master of Arts in Teaching (M.A.T.), Master of Arts (M.A.) with a major in art, and Master of Arts (M.A.) with a major in architecture.

Undergraduate Program

The undergraduate curricula are designed to provide both a general and a professional education. All curricula within the college include a first-year basic design core as well as foundation courses unique to each discipline. The college design core for all undergraduate majors consists of Art 101, 111-112, and 121-122. The curricular options in each department offer many courses in common with other college departments. Flexibility and individuality in each student's program are provided by curriculum choice, by options within curricula, and by elective credits.

Graduate Programs

Graduate programs in the College of Art and Architecture offer the flexibility of independent studies and the guidance of an assigned faculty adviser/mentor. Students are responsible for formulating a detailed plan of study under faculty guidance. It is intended that graduate study serve as a transition from undergraduate apprenticeship to the student's emergence as a fully independent, creative artist or designer. Assistantships are available to help highly qualified students in their graduate program. More complete information on graduate studies is contained in the *Graduate Bulletin,* which may be obtained from either the College of Graduate Studies or the registrar.

Scholarships and Awards

Scholarships and awards are available to students and prospective students. See "Financial Aid" and "Special Awards" in the Student Advisory Services section of part 2. Also, get in touch with specific program administrators.

General Requirements for Graduation

University Requirements. See regulation J in part 3 for the all-university requirements for graduation.

College Requirements. See part 5 for specific degree requirements within each department.

On registering for a studio course offered in this college, the student agrees that the department offering the course may retain work completed by the student. The department will make retained work available to the student for photographing.

College of Business and Economics

Byron J. Dangerfield, Acting Dean (211-A Admin. Bldg.); Dana Wekerle, Administrative Coordinator; Dolores A. Sanchez, Secretary of the College Faculty.

The college was established as a professional division of the university in 1925. Long known as the College of Business Administration, it became the College of Business and Economics (CBE) in 1969. Its principal objective is to provide education for careers in the private sector, including large firms and entrepreneurial ven-

tures, and the public sector, including government agencies. A university education should prepare the student for a career, not just a job. Accordingly, CBE curricula provide a broad, liberal education comparable to other university studies. Highly specialized instruction in job-specific business practices is avoided. The curriculum emphasizes knowledge and understanding of the fundamental disciplines, concepts, and ethics involved in making decisions in private enterprise and public service.

The College of Business and Economics provides a sound background in the basic business principles that will help graduates as they advance into positions of responsibility. As part of a state-supported land grant university, the CBE also aims to give its students an appreciation of the social importance and responsibilities of businessmen and businesswomen, and both the values and the knowledge to discharge those responsibilities.

Through the Center for Business Development and Research, the college contributes to business development and the advancement of knowledge about our state's economy and its business activities. The center conducts management development programs for business and governmental organizations, a business publications program to provide data on the Idaho economy, and funded research projects that involve CBE and other UI faculty members and students in solving practical problems in Idaho and the Northwest.

Curricula and Degrees Offered

Undergraduate. The degree of Bachelor of Science in Business is offered with seven majors through three departments, as follows: Department of Accounting — accounting; Department of Business — finance, human resources management, information systems, marketing, and production/operations management; Department of Economics — economics.

Specific requirements for each major are described in part five, "Departments of Instruction," under the appropriate department. The program of study includes three principal components: the general university requirements, the business and economics core, and the requirements for the selected CBE major field. Detailed statements of college requirements are under "General Requirements for Graduation."

Graduate. The CBE, through the College of Graduate Studies, offers the degree of Master of Science (M.S.) in economics. The M.S. in economics provides students with a firm grounding in theory, and then emphasizes training in policy analysis and applied studies.

Graduate students must fulfill the requirements of the College of Graduate Studies and the department in which they study. Consult the Graduate Bulletin for further information.

Standing of the College

Fully accredited by the Northwest Association of Schools and Colleges, the College of Business and Economics keeps apace of developments in business through membership in various professional organizations and by consultation with Idaho business leaders, particularly through the CBE Advisory Board. The outstanding achievements of CBE graduates in business and government, and in professional certification examinations, such as the CPA exam, attest to the quality of the programs.

General Requirements for Graduation

University Requirements. See regulation J-3 in part 3 for requirements that all students in the university must meet.

College Requirements. Before proceeding to upper-division work, students registered in the College of Business and Economics must: (1) complete at least 58 semester credit hours with a minimum cumulative grade-point average of 2.00 and (2) earn at least a 2.40 grade-point average in Econ 151 and 152, Principles of Economics; Acctg 201 and 202, Principles of Accounting; and Stat 251, Principles of Statistics.

Before pursuing upper-division course work, a student must have completed no fewer than 58 credits of course work applicable to the degree. A student who satisfies the 2.40 minimum grade-point average requirement in the five courses listed above, but fails to earn at least a 2.00 cumulative grade-point average for the first two academic years, may not register for more than one upper-division course (those numbered 300 and above) in the College of Business and Economics in any one semester until his or her cumulative grade-point average is raised to the required minimum level. A student who fails to achieve the 2.40 grade-point average in the five courses above will be precluded from pursuing upper-division course work within the college.

A student must achieve a grade of C or better in each upper-division College of Business and Economics course listed in the requirements in business and economics (section B, below) and in each course used to satisfy major requirements (section C, below) before becoming eligible to graduate. A student is required to have at least 40 percent of the required credits in College of Business and Economics courses and at least 40 percent of the required credits in non-College of Business and Economics courses. Undergraduate students enrolled as majors in the College of Business and Economics may not take any CBE course on a pass/fail basis, with the exception of those courses offered only on a P/F basis.

Courses completed at a two-year college for transfer into the CBE core or major must be validated before they will be accepted for upper-division course requirements. Validation procedures are established by the faculty members of the CBE department offering these courses. Validation techniques include a proficiency examination, CLEP testing, or successful completion of an additional advanced course in the given field.

The major in accounting requires the completion of at least 136 credit hours; all other majors require the completion of at least 128 credit hours. The required program of study includes: (1) at least 52 credit hours in required and elective nonbusiness courses, (2) 36 credit hours in the business and economics core, and (3) at least 18 credit hours in the selected CBE major field. Additional undesignated electives are included in the 128 or 136 required credit hours. Candidates must demonstrate an acceptable level of proficiency in written business communication. This may require successful completion of a CBE writing proficiency exam, in addition to the required writing courses.

A. *UNIVERSITY/CBE GENERAL CORE REQUIREMENTS:*

Course	Credits
Communication:	
CommG 131 Fundamentals of Public Speaking	2
Eng 103, 104 Basic Skills & Essay Writing	6
Eng 205 Adv Expository Writing or 313 Business Writing or 317 Technical & Engineering Report Writing	3
Mathematics:	
Math 111 Finite Mathematics	4
Math 160 Survey of Calculus or 180 Analytic Geometry & Calculus I	4
Stat 251 Principles of Statistics	3
Social Sciences:	
Econ 151, 152 Principles of Economics	6
Social science elective*	3
Humanities:	
Phil 101 Ethics	3
Humanities elective*	3
Literature elective	3
Natural and Applied Sciences:	
Natural and applied sciences electives*	8
Other courses:	
Acctg 201, 202 Principles of Accounting & Managerial Accounting	6
BLaw 265 Legal Environment of Business	3
CS 112 Introduction to Problem Solving & Programming	3
Nonbusiness elective (accounting majors take 4 credits)	1

*To be chosen from courses that will satisfy regulation J-3.

B. *CBE COMMON PROGRAM REQUIREMENTS:*

Course	Credits
Bus 301 Financial Management	3

Bus 311 Introduction to Management	3
Bus 321 Marketing	3
Bus 332 Quantitative Methods in Business	3
Bus 350 Management Information Systems	3
Bus 370 Production/Operations Management	3
Bus 474 International Business or Econ 474 International Economics	3
Bus 480 Business Policy	3
Upper-division economics electives	3

C. *REQUIREMENTS IN MAJOR* (at least 18 credits).

D. *ELECTIVES* (8-23 credits). Chosen in consultation with the student's adviser.

Undeclared Status

A student may enter CBE as a freshman in an undeclared status. Because the first two years are equivalent programs in all CBE majors, he or she may remain in the undeclared status until reaching junior level (completion of 58 credits). At that time, a major in the college should be selected. The undeclared status allows a student time to become acquainted with the majors within the college and to solidify career objectives before choosing a major.

College of Education

N. Dale Gentry, Dean (301 Educ. Bldg.); Larry K. Wriggle, Acting Assistant Dean; Barbara Hopkins, Secretary of the College Faculty.

The College of Education was organized as an independent unit of the university in 1920. It is the principal teacher-education division and consists of the Division of Health, Physical Education, Recreation and Dance, the Division of Teacher Education, the Division of Vocational Teacher and Adult Education, the Department of Counseling and Special Education, and the Department of Educational Administration. Undergraduate programs leading to degrees in teaching fields are offered in business education, dance (teaching option), elementary education, industrial technology education, marketing education, office occupations education, physical education, secondary education, special education, and trade and industrial/technical education (teaching option). Programs leading to nonteaching degrees include: dance, industrial technology, office administration, physical education, recreation, and trade and industrial/technical education.

The education of professional personnel for the public schools constitutes a service to the state and its people and to the education profession. One of the first duties of the college is that of ensuring that anyone who applies for admission to a program leading to educational service is qualified by preparation and personal attributes for this important work. Once admitted, the student undertakes a program that has as its objective assurance that the candidate has laid the foundation for a broad, general education, has completed a basic study of the professional functions of the teacher, and has gained substantial competence in the subjects to be taught or in the area in which he or she will serve.

Besides preparing personnel for the schools, the college provides educational leadership for the people of Idaho, to the state's education system, and to the teaching profession through consulting services, participation in organizational activities, and research. Preparation is provided in all of the major areas of professional education.

Standing of the College

The College of Education is fully accredited by the National Council for the Accreditation of Teacher Education and the National Association of State Directors of Teacher Education and Certification. The programs of study in education are planned to meet certification requirements in Idaho, those of most other states, and the requirements of the various accrediting agencies, such as the Northwest Association of Schools and Colleges.

Center for Educational Research and Service

The Center for Educational Research and Service was established to conduct research, to facilitate research by College of Education faculty members and graduate students, and to be of assistance to local school districts and to other educational institutions. Research, study, and statistical facilities are made available to students and faculty through the center. The Upward-Bound Program, designed to help youth from low-income families achieve a college education, is housed in the center.

Center personnel have cooperated with local school districts and with the Idaho State Department of Education in such activities as school district surveys, the development and implementation of programs under federal acts, school district reorganization studies, and certification studies. Research reports or monographs on these and other activities are published through the center.

The center is financed in part through cost-reimbursement funds from state and federal sources.

Admission Requirements

Admission to the University. For a statement of general admission requirements, see part 2.

Transfer Students. Students who have attended college, whether at another institution or in another division of the university, before matriculation in the College of Education, must have a grade-point average of 2.00 (C) or better. The approval of the dean of the College of Education is necessary for the admission of transfer students.

Degrees and Programs Offered

Undergraduate. Baccalaureate degrees offered by this college are the Bachelor of Science in Education, Bachelor of Science in Business Education, Bachelor of Science in Office Administration, Bachelor of Physical Education, Bachelor of Science in Recreation, Bachelor of Dance, and Bachelor of Technology. See part 5 for the programs of studies leading to these degrees.

Graduate. The College of Graduate Studies offers work toward advanced degrees in several disciplines of the college. Students must fulfill the requirements of the Graduate College and of the department in which they intend to study. Consult the *Graduate Bulletin* for further information.

In the College of Education, graduate programs include a planned fifth year in teacher education and advanced degrees. Upon the completion of the appropriate programs of study, the following degrees are conferred: Master of Science, Master of Education, Specialist in Counseling and Human Services, Specialist in Education, Specialist in Educational Administration, Specialist in School Psychology, Specialist in Special Education, Specialist in Vocational Education, Doctor of Education, and Doctor of Philosophy.

Studies at the master's level are offered in business education, counseling and human services, educational administration, elementary education, industrial technology education, physical education, recreation, secondary education, special education, and vocational education.

Sixth-year specialist degrees are offered in counseling and human services, education, educational administration, school psychology, special education, and vocational education.

Doctoral candidates majoring in education may concentrate in counseling and human services, education, educational administration, elementary education, physical education, secondary education, special education, or vocational education.

Teacher Education Program

At the University of Idaho, the preparation of teachers is a cooperative enterprise between the College of Education and other colleges. Coordination is achieved through the Teacher Education

Coordinating Committee, which is made up of representatives from the professional and academic areas involved. However, the screening of all applicants for admission to or continuance in the Teacher Education Program is the responsibility of the College of Education, and the dean of the College of Education is the recommending authority for certification.

Students preparing for a career in secondary teaching have the option of completing their bachelor's degrees in the College of Education (except for agricultural education, home economics education, and music education) or in the department of their subject major.

Secondary teacher education students have an adviser from the College of Education who is the primary adviser on teacher education requirements. When a student identifies teacher education as his or her objective (this could be as early as the freshman year and certainly no later than admission to the Teacher Education Program), the adviser is designated. As long as the approved teaching major and minor program is followed, only the student's college adviser is required to sign the registration cards. Changes in the academic program require the written approval of the academic department. Students majoring in agricultural education, home economics education, music education, and subject-matter areas in the College of Education have advisers in their subject-matter areas only.

Admission to the Teacher Education Program. The following regulation is effective beginning fall 1988 for all UI students who apply for admission to the Teacher Education Program regardless of the date of their entry into the university. Upon completion of the first semester of the sophomore year, or 40 semester credits, all students in the College of Education and all students majoring in other colleges who plan to enter the Teacher Education Program must make application for admission to or continuance in the program. A standing committee of the college reviews each applicant's total record and presents its recommendations to the dean. Criteria for admission to the Teacher Education Program include the following: (1) completion of at least 40 semester hours with a 2.5 cumulative GPA including any transfer credits and/or credits earned in a prior degree program; (2) achievement of minimum cut-off scores on the NTE Test of Communication Skills and the Test of General Knowledge (values are available in the dean's office); (3) completion of Eng 104 with a P grade (transfer students must pass the UI Writing Proficiency Test); (4) completion of the university core requirement in math/computer science/statistics; (5) completion of Ed 201, Introduction to Teaching; (6) signature of an authorized education faculty adviser; (7) recommendations from the student's Ed 201 instructor (having received a grade of C or higher), the Ed 201/204 field experience cooperating teacher, and one other university faculty member; and (8) approval of the Education Admissions Review Committee. The approval of the dean of the College of Education is required for admission to or continuance in the program. Admission to the Teacher Education Program does not carry with it permission to enroll in senior practicum courses. Additional procedures and requirements apply as noted elsewhere in this section and as noted in the prerequisites to the specific courses in senior practicum.

Clinical Experience in Teacher Education

The clinical study of teaching and learning theory is given practical application through laboratory experience in both campus and field settings. Teacher trainees have early involvement with school pupils and experienced teachers through semester laboratory components for all students in Ed 201, Introduction to Teaching, and semester campus or field laboratory components for special education majors. Additional clinical experience is provided students as they continue professional studies through simulated teaching situations on campus and through field laboratory components for students of methodology. Culminating clinical teaching experience is provided in the senior practicum or graduate internship.

Senior Practicum

Admission. For admission to senior practicum courses (AgEd 460, Ed 430, 431, 432, 435, HEc 457, SpEd 480), the student must have satisfied the following requirements: (1) have been admitted to or continued in the Teacher Education Program; (2) have a grade-point average of at least 2.50; (3) have a grade of C or better in the common core education courses (those listed in the College of Education student handbook; (4) have a minimum 2.25 GPA in the teaching majors or minors; (5) have satisfied the other prerequisites stated in the description of the particular practicum course for which he or she wishes to register; and (6) have applied for admission to senior practicum by December 1 of the school year before enrolling for the field experience. Consult the director of clinical experiences in teacher education for more specific information.

The Program. The senior practicum is carried out in cooperating public schools so that students may obtain experience under typical school conditions. Normally it is scheduled for half of a semester of full-time teaching in centers designated by the College of Education. Students should plan their schedules for the senior year so that half of a semester will be free for full-time enrollment in the practicum and the other half of the semester for enrollment in accelerated courses. An option is provided for both elementary and secondary majors to pursue a full semester of senior practicum combined with professional courses in selected centers.

Beginning in the fall of 1990, the requirement for senior practicum will be increased to at least 10 weeks to conform with NCATE accreditation requirements. Thereafter, students should plan to enroll only in student teaching their last semester.

Graduate Practicum and Internship in School Positions

Admission. Admission to the practicum and internship courses is conditioned upon acceptance in a graduate program and approval of the major professor and/or student's committee. Application for placement in the practicum or internship should be submitted by December 1 of the school year before enrolling in the field experience.

The Program. Graduate students are provided clinical experience in the study of teaching and learning and in the performance of other school positions through graduate practica and internships (see courses 597 and 598 in the various subject fields in the college).

Teacher Certification

Students who complete the four-year Teacher Education Program at the university and who achieve the state's minimum cut-off scores in the NTE Tests of Professional Knowledge, Communication Skills, and General Knowledge are eligible to receive the Idaho Standard Elementary School Certificate, the Standard Secondary School Certificate, the Exceptional Child Certificate, or the Standard Vocational Certificate. Those who complete an approved, planned fifth-year program in teacher education or an approved master's degree program are eligible to receive the Advanced Elementary School Certificate or the Advanced Secondary School Certificate. Students who complete the professional certificate program in guidance and counseling qualify for the Idaho Pupil Personnel Services Certificate. Students completing a master's degree, specialist degree, or doctorate in educational administration may qualify for an administrator's certificate.

The College of Education reserves recommendations for certification to students who have completed the teacher preparation program and hold a bachelor's degree. In Idaho, the recommendation for certification requires students to achieve minimum cut-off scores on the NTE Tests of General Knowledge, Communication Skills, and Professional Knowledge.

Secondary School Teaching Certification for Majors Outside the College of Education

Students admitted to the Teacher Education Program who are enrolled in a department or college not offering major studies in teacher education normally satisfy the requirements for the Idaho Standard Secondary-School Certificate by including the 26-credit core listed below as electives in their program for the baccalaureate degree and by completing one of the following options: (1) one 60-credit teaching major; (2) one 40-credit teaching major and one 20-credit teaching minor; (3) one 30-credit teaching major and one 20-credit teaching minor; or (4) two 30-credit teaching majors. (See "Teaching Majors and Minors" at the conclusion of the College of Education section.)

27-Credit Core. Introduction to Teaching, 2 cr (Ed 201); Educational Psychology, 2 cr (Ed 312); Strategies for Teaching, 3 cr (Ed 314); Special Methods, 2-3 cr (Ed 474, 475, 476, 477, 478, 479, or another approved special methods course); Methods of Teaching Content Reading, 3 cr (Ed 340); Proseminar in Teaching, 3 cr (Ed 445); Practicum, 9 cr (Ed 431 or another approved practicum course); Historical and Philosophical Foundations of Education, 3 cr (Ed 468). Note: Psych 100, Introduction to Psychology, is the prerequisite to Ed 312.

Exceptions. Teacher education students majoring in the College of Education, the Department of Agricultural and Extension Education, the Ritchie School of Home Economics, or the Hampton School of Music have slightly different requirements. See the curricula for these fields in the corresponding appropriate departmental sections.

Procedures. The student initiates the certification process by obtaining an application for teacher certification from the College of Education. The application is completed and signed by the student's adviser and is then forwarded to the dean of the College of Education who works with the registrar to get the necessary supporting credentials and forwards the materials to the State Department of Education's Certification Division. The College of Education maintains a record of all students recommended for teacher certification, and it is understood that recommendations concerning a student's competence are made by the department in which the skills and concepts are taught.

General Requirements for Graduation

University Requirements. See regulation J in part 3 for requirements that all students in the university must meet.

College Requirements. All candidates for a baccalaureate degree in the College of Education must complete 128 semester credits, of which at least 36 must be in upper-division courses. The following course requirements apply to all undergraduate teacher education students in the college (see the major curricula in dance, industrial technology, office administration, recreation, sport science, and trade and industrial/technical education for the special requirements applicable to those programs):

A. *GENERAL STUDIES REQUIREMENTS FOR ELEMENTARY SCHOOL TEACHING (57 credits minimum).* In order to apply toward this requirement, courses must be other than education and be selected from among the humanities, social sciences, and natural sciences. Credits earned in these fields to satisfy the teaching minor may apply if they do not deal primarily with the methodology, procedures, or materials of teaching. Each of the following areas must be represented as indicated:

1. *Communications (8 credits)* (prerequisite basic skills for writing), including essay writing (Eng 104), composition, and speech. The UI core curriculum requires Eng 104 and 2-4 credits from the core list.

2. *Humanities (10 credits),* including 6 credits of literature, 2 credits of art, and 2 credits of music selected from nonmethods courses. Six to eight credits should be selected from the core curriculum humanities list.

3. *Psychology (6 credits),* including introductory psychology (Psych 100) and developmental psychology (Psych 305).

4. *Social Science (12 credits),* including one course in American history (Hist 111 or 112), one course in American government (PolSc 101), and 6 other credits from social sciences (other than psychology). Three to five credits must be from the UI core curriculum list.

A total of 14 credits must be from the humanities and social science core list categories.

5. *Science (12 credits),* including biological, earth, and physical science courses requiring laboratory work. Select 4 credits each from the areas of (a) life science, (b) earth sciences, and (c) physical sciences. At least 8 credits must be from the UI core curriculum list in natural and applied sciences.

6. *Mathematics (9 credits):* Math 135-136, Math for Elementary Teachers, and 3 credits from the UI core curriculum list in mathematical, statistical, and computer science (refer to prerequisites for Math 135-136).

B. *GENERAL STUDIES REQUIREMENTS FOR SECONDARY SCHOOL TEACHING (37 credit minimum).* In order to apply toward this requirement, courses must be other than education and be selected from among the humanities, social sciences, and natural sciences. Credits earned in these fields to satisfy the teaching major or teaching minor may apply if they do not deal primarily with the methodology, procedures, or materials of teaching. Each of the following areas must be represented as indicated:

1. *Communications (8 credits)* (prerequisite basic skills for writing), including essay writing (Eng 104), composition, and speech. The UI core curriculum requires Eng 104 and 2-4 credits from the core list.

2. *Humanities (6 credits),* including at least 3 credits of literature. The UI core curriculum requires that 6 to 8 credits be selected from the humanities category.

3. *Psychology (3 credits):* Psych 100, Introduction to Psychology.

4. *Social Science (9 credits),* including at least one course in American history (Hist 111 or 112) or American government (PolSc 101). Three to five credits must be selected from the UI core list in this category (other than psychology).

The UI core curriculum requires 14 credits in the combined categories of humanities and social sciences. The core social science list includes Psych 100.

5. *Science-Mathematics (11 credits),* including biological, earth, or physical science courses requiring laboratory work. The UI core curriculum requires 8 credits from natural and applied sciences and 3 credits from mathematical, statistical, and computer sciences.

C. *UNIFORM REQUIREMENTS FOR ELEMENTARY AND SECONDARY TEACHING (23 CREDITS):*

Course	Credits
Ed 201 Introduction to Teaching	2
Ed 314 Strategies for Teaching	3
Ed 328 Audiovisual Aids	1
Ed 312 Educational Psychology	2
*Ed 430 or 431 or 432 or SpEd 480 Practicum	14
Ed 445 Proseminar in Teaching	3
Ed 468 Historical & Philosophical Foundations of Ed	3

Note: Secondary education majors must take Ed 340, Methods of Teaching Content Reading, and the appropriate special methods course.

*Students preparing to teach art or physical education in secondary schools may substitute 3 credits in Ed 435 for 3 of the 9 credits in Ed 431.

Major Curricula

Students in the College of Education must complete a major curriculum that leads to a degree granted by the college (B.Dan., B.S.Ed., B.S.Bus.Ed., B.S.P.E., B.S.Rec., B.Tech., or B.S.O.Ad.). These major curricula (with the degree goal identified) are listed in part 5.

Careful distinction should be made between a student's "major curriculum" and any additional "teaching majors" or "teaching minors" required.

Teaching Majors and Minors in the College of Education

The various teaching majors and teaching minors required to accompany several of the curricula listed in part 5 are outlined below. Because the College of Education reserves the right to approve or disapprove the content of all proposed teaching majors and minors, students should confer closely with their college advisers and with advisers in the academic departments concerned in the selection of these courses.

AGRICULTURAL EDUCATION

The major in agricultural education is offered only in the major curriculum leading to the degree of B.S.Ag.Ed. (see part 5). A teaching major in agricultural education is not offered.

AMERICAN STUDIES

There is no teaching endorsement in American studies in the state of Idaho. However, students earning a degree in American studies through the College of Letters and Science are able to work toward endorsements in English, history, or social science depending on which emphasis they choose in the American studies curriculum and by choosing their electives carefully. Students seeking endorsement in English will take Ed 475 as their special methods course, and students seeking endorsement in history or social studies will take Ed 476 as their special methods course. American studies students seeking endorsement should read the appropriate section under the English heading, the history heading, or the social science heading in this part of the catalog.

ART

A. 40-CREDIT ART TEACHING MAJOR

Course	Credits
Art 101 Visual Art	3
Art 111-112 Drawing I	4
Art 121-122 Visual Communication & the Design Process	6
Art 211 Drawing II	3
Art 241 Sculpture I	3
Art 301-302 History of Art	6
Arch 155 Introduction to Architecture	2
Courses selected from the following	12
Art 221 Graphic Design I (3 cr)	
Art 231 Painting I (2 cr)	
Art 251 Printmaking I (3 cr)	
Art 261 Ceramics I (2 cr)	
Art 271 Jewelry I (2 cr)	
Art 281 Water Color I (3 cr)	
One art studio course (Art 311, 321, 331, 341, 351, 361, 371, or 381)	3

B. 20-CREDIT ART TEACHING MINOR

Course	Credits
Art 101 Visual Art	3
Art 111-112 Drawing I	4
Art 121-122 Visual Communication & the Design Process	6
Courses selected from Art 211, 221, 231, 241, 251, 261, 271, 281, or Art 311, 321, 331, 341, 351, 361, 371, 381	7

ATHLETIC TRAINING

A teaching major in athletic training is not offered.

23-CREDIT ATHLETIC TRAINING TEACHING MINOR

Note: Athletic training is not a certified or endorsed teaching subject area in Idaho. Chem 103 and Zool 119 are required for students who select this minor.

Course	Credits
H&S 245 Introduction to Athletic Injuries	3
H&S 289 Drugs in Society	2
H&S 349 Advanced Athletic Injuries	3
H&S 410 Athletic Rehabilitation & Administration	2
H&S 498 Practicum in Tutoring	2
HEc 205 Concepts in Human Nutrition	3
HEc 305 Nutrition Related to Fitness & Sport	2
PE 300 Human Kinesiology	2
PE 418 Physiology of Exercise	3
Rec 431 Medical Terminology	1

BIOLOGICAL SCIENCES

Note: Organic chemistry is a prerequisite to required botany and zoology courses; Math 140 is a prerequisite to required physics courses.

A. 60-CREDIT COMPOSITE TEACHING MAJOR

Course	Credits
Bact 250 General Microbiology	4
Biol 201 Introduction to the Life Sciences	4
Biol 202 General Zoology	4
Biol 203 General Botany	4
Biol 331 General Ecology	3
Biol 351 General Genetics	3
Biol 352 Experimental Genetics	2
Biol 361 Biological Literature	1
Bot 241 Systematic Botany	3
Bot 311, 312 Plant Physiology & Lab	5
Bot 425 Developmental Plant Anatomy	3
Geog 100, 101 Physical Geography & Lab or Geol 101, 102 Physical Geology & Lab	4
Phys 113-114-115-116 General Physics & Lab	8
Zool 324 Comparative Vertebrate Anatomy or 472, 473 Developmental Biology & Lab	4
Zool 423 Comparative Vertebrate Physiology	4
Approved electives from bacteriology, biology, botany, entomology, or zoology	4

B. 25- OR 26-CREDIT COMPOSITE TEACHING MINOR

Note: One course in college chemistry is a prerequisite to Biol 201; organic chemistry is a prerequisite to Bot 311 and Zool 423.

Course	Credits
Biol 201 Introduction to the Life Sciences	4
Biol 202 General Zoology	4
Biol 203 General Botany	4
Biol 331 General Ecology	3
Biol 351 General Genetics	3
Bot 241 Systematic Botany or 311 Plant Physiology or 425 Developmental Plant Anatomy	3
Zool 324 Comparative Vertebrate Anatomy or 423 Comparative Vertebrate Physiology	4

BUSINESS EDUCATION

The major in business education is offered only in the major curriculum leading to the degree of B.S.Bus.Ed. (see part 5).

20-CREDIT BOOKKEEPING TEACHING MINOR

Course	Credits
BusEd 102 Typewriting II	2
BusEd 491 Teaching Business Education I	3
Acctg 201 Principles of Accounting	3
Acctg 202 Managerial Accounting	3
BLaw 265 Legal Environment of Business	3
Econ 151, 152 Principles of Economics	6

CHEMISTRY

Note: See the physics and mathematics prerequisites for the chemistry courses listed below.

A. 42-CREDIT CHEMISTRY TEACHING MAJOR

Course	Credits
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
Chem 253 Quantitative Analysis	5
Chem 275, 276 Carbon Compounds & Lab and Biochem 380, 382 Intro Biochem & Lab or Chem 277, 278 Organic Chem I & Lab and Chem 372, 376 Organic Chem II & Lab	8-9
Chem 302, 303 Principles of Physical Chemistry & Lab	4
Biol 201 Introduction to the Life Sciences	4
Math 180 Analytic Geometry & Calculus I	4
Phys 113-114-115-116 General Physics & Lab	8

B. 20-CREDIT CHEMISTRY TEACHING MINOR

Course	Credits
Chem 111 Prin of Chemistry or 103 Intro to Chemistry	4
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
Chem 275, 276 Carbon Compounds & Lab	4
Chem 302, 303 Principles of Physical Chemistry & Lab	4
Biochem 380 Introductory Biochemistry	3

COACHING

A teaching major in coaching is not offered.

22-CREDIT COACHING TEACHING MINOR

Note: Coaching is not a certified or endorsed teaching subject in Idaho. Zool 119 is required for students who select this minor.

Course	Credits
H&S 245 Introduction to Athletic Injuries	3
H&S 289 Drugs in Society	2
H&S 349 Advanced Athletic Injuries	3
HEc 305 Nutrition Related to Fitness & Sport	2

PE 204 Special Topics: Coaching 4
PE 300 Human Kinesiology or PE 418 Physiology of Exercise 2-3
PE 305 Applied Sports Psych or PE 310 Cultural & Phil Aspects of Sport 2-3
PE 497 Athletic Program Management 3
PE 498 Practicum in Tutoring 1

COMMUNICATION

40-CREDIT COMMUNICATION TEACHING MAJOR

Course	Credits
CommG 131 Fundamentals of Public Speaking	2
CommG 233 Interpersonal Communication	3
CommG 331 Conflict Management	3
CommG 332 Communication & the Small Group	3
Comm 121 News Writing	3
Comm 140 Mass Media & Society	3
Comm 222 Reporting	3
Comm 278 Introduction to Radio/TV Production	3
Comm 281 Understanding Photography	3
Comm 325 News Editing	3
Comm 362 Print Media Advertising	3
Comm 374 Broadcast News Writing/Production	3
Comm 378 Television Production	3
Comm 431 Professional Presentation Techniques	3
Comm 441 Ethics in Mass Communication	3

COMPUTER SCIENCE

Computer science is not an area of endorsement for Idaho certification. Students may complete a secondary minor in computer science only under the 30-20-20 option where the 30 credit major and one of the 20 credit minors are in endorsement areas.

20-CREDIT COMPUTER SCIENCE TEACHING MINOR

Course	Credits
CS 112 Introduction to Problem Solving & Programming	3
CS 113 Program Design & Algorithms	3
CS 213 Data Structures	3
CS 241 Computer Organization	4
Math 176 Discrete Mathematics	4
Electives chosen from the following	3
CS 307 History of Calculating	
CS 310 Computing Languages	
CS 324 Computer Graphics	
CS 381 Software Engineering	
Math 405/CS 495 Analysis of Algorithms	
Math 485/CS 490 Theory of Computation	

CONSUMER ECONOMICS

A teaching major in consumer economics is not offered. Students selecting a minor in consumer economics must have a major in social science, home economics, business education, or marketing education to meet both college graduation requirements and state certification requirements.

20-CREDIT CONSUMER ECONOMICS TEACHING MINOR

Course	Credits
BLaw 265 Legal Environment of Business	3
BusEd 418 Teaching Consumer Economics	2
Econ 151, 152 Principles of Economics	6
HEc 448 Consumer Education	3
Electives chosen from the following	5-6
Acctg 201 Principles of Accounting	
Bus 321 Marketing	
Bus 403 Insurance	
Econ 403 Money & Banking	
HEc 123 Textiles	
HEc 346 Family Resource Management	
HEc 428 Family Housing	
HEc 478 Recent Advances in Foods	

COUNSELING AND HUMAN SERVICES

An undergraduate major is not offered in counseling and human services. Students who wish to qualify for counseling and human services may qualify as teachers in any subject area and enroll in counseling programs later in graduate school. Those definitely planning to become counselors should seek advice from the counseling faculty. Those who do not wish to qualify as teachers may arrange for a special one-semester counseling internship in addition to the graduate program in counseling and human services.

DANCE

The major in dance is offered only in the major curriculum leading to the degree of B.Dan. (see part 5).

21-CREDIT DANCE TEACHING MINOR

The dance minor provides broad experiences in techniques, composition, production, and teaching.

Course	Credits
Dan 105 Dance (ballet, jazz, modern)	4
Dan 112 Basic Dance Forms	3
Dan 320 Labanotation	3
Dan 321 Dance Pedagogy	3
Dan 325 Dance Production	3
Dan 383 Dance Composition	2
Dan 420 Dance Accompaniment	3

EARTH SCIENCE

45-CREDIT COMPOSITE TEACHING MAJOR

Course	Credits
Biol 201 Introduction to the Life Sciences	4
Chem 103 Intro to Chemistry or 111 Prin of Chemistry	4
Geog 100, 101 Physical Geography & Lab or Geol 101, 102 Physical Geology & Lab	4
Geog 180-181-182 Spatial Graphics	3
Geog 360 Population Dynamics & Distribution	3
Geog 380 Cartography & Graphic Communication	4
Geog 401 Atmospheric Environment	3
Geol 106, 107 Historical Geology & Lab	4
Geol 212 Principles of Paleontology	4
Geol 260 Survey of Minerals	2
Geol 261 Survey of Rocks	2
Geol 335 Geomorphology	3
Math 140 Pre-calculus Algebra & Analytic Geometry	3
Phys 103 General Astronomy	3

ECONOMICS

A teaching major in economics is not offered.

20-CREDIT ECONOMICS TEACHING MINOR

Course	Credits
Econ 151, 152 Principles of Economics	6
Econ 321 Intermediate Microeconomic Analysis	3
Econ 372 Intermediate Macroeconomic Analysis	3
Additional upper-division credits in economics	7-8

EDUCATIONAL ADMINISTRATION

No undergraduate major or minor is offered in educational administration. Students who are planning to go into this field must first obtain a bachelor's degree, complete requirements for teacher certification, and have teaching experience, then enter the College of Graduate Studies to pursue a program leading to an advanced degree in educational administration.

ENGLISH

A. 42-CREDIT ENGLISH TEACHING MAJOR

Course	Credits
Eng 111 or 112 Literature of Western Civilization	3
Eng 211-212 Critical Approaches to Literature I-II	6
Eng 309 Advanced Prose Writing	3
Eng 341-342 Survey of British Literature	6
Eng 343-344 Survey of American Literature	6
Eng 345 Shakespeare	3
Eng 401 Writing Workshop for Teachers	3
Eng 441 Introduction to Study of Language	3
Eng 442 or 443 or 496 Linguistics	3
Eng 445 Literature for Adolescents	3
One 400-level area literature course	3

B. 33-CREDIT ENGLISH TEACHING MAJOR

Course	Credits
Eng 211-212 Critical Approaches to Literature I-II	6
Eng 309 Advanced Prose Writing	3
Eng 341-342 Survey of British Literature	6
Eng 343-344 Survey of American Literature	6
Eng 401 Writing Workshop for Teachers	3
Eng 441 Introduction to Study of Language	3
Eng 442 or 443 or 496 Linguistics	3
Eng 445 Literature for Adolescents	3

C. 24-CREDIT ENGLISH TEACHING MINOR

Course	Credits
Eng 211-212 Critical Approaches to Literature I-II	6
Eng 341 Survey of British Literature	3
Eng 343 Survey of American Literature	3
Eng 342 or 344 British or American Literature	3
Eng 401 Writing Workshop for Teachers	3
Eng 441 Introduction to Study of Language	3
Eng 445 Literature for Adolescents	3

D. 33-CREDIT ENGLISH TEACHING MAJOR THROUGH AMERICAN STUDIES

Students complete the College of Letters and Science major in American studies with the following specifications:

Course	Credits
Courses from the American Studies requirements	
Eng 343-344 Survey of American Literature	6

Eng 341 or 342—one of the two reqd courses in English (British) literature 3
Electives in American English, selected from the list of electives in the curricular requirements of the lit emphasis in the American Studies degree (incl 3 at the 400 level, one of which is Eng 441) 12
Courses in addition to those reqd for the lit emphasis of the American Studies degree:
Eng 309 Advanced Prose Writing 3
Eng 401 Writing Workshop for Teachers 3
Eng 442, 443, or 496 Linguistics 3
Eng 445 Literature for Adolescents 3

ENGLISH AS A SECOND LANGUAGE

A teaching major in English as a second language is not offered.

21-CREDIT ENGLISH AS A SECOND LANGUAGE TEACHING MINOR

Course	Credits
Eng 404 Special Topics: ESL Methods	3
Eng 441 Introduction to the Study of Language	3
Eng 442 Introduction to English Syntax	3
Anthr/Soc 322 Racial & Ethnic Relations	3
Electives, of which at least two courses are in English language and linguistics (Anthr 220 and Soc 324 may be used for the third course)	9

EXERCISE SPECIALIST

A teaching major in exercise specialist is not offered.

20-CREDIT EXERCISE SPECIALIST TEACHING MINOR

Note: Exercise specialist is not a certified or endorsed teaching subject area in Idaho. Students electing this minor must include an anatomy and physiology course such as Zool 119.

Course	Credits
H&S 150 Wellness Lifestyles	3
H&S 288 First Aid or 245 Introduction to Athletic Injuries	2-3
H&S 404 Special Topics: Stress Management	2
HEc 205 Concepts in Human Nutrition	3
PE 105 Dance Aerobics	1
PE 106 Weight Training	1
PE 108 Aqua Fitness	1
PE 201 Fitness Activities & Concepts	2
PE 418 Physiology of Exercise	3
PE 498 Practicum in Tutoring	2
Rec 365 Leisure & the Aging Process	3

FRENCH

Basic language courses taken in high school or elsewhere may be evaluated for college equivalencies as part of this teaching major and minor. Consult the Department of Foreign Languages and Literatures for policies on advanced placement.

A. 40-CREDIT FRENCH TEACHING MAJOR

Course	Credits
FL/FR 101-102 Elementary French	8
FL/FR 201-202 Intermediate French	8
FL/FR 301 Advanced French Grammar	3
FL/FR 302 Advanced French Writing Skills	3
FL/FR 303 French Civilization: Institutions	3
FL/FR 304 French Culture	3
FL/FR 305 Survey of French Fiction & Drama	3
FL/FR 306 Survey of French Essay & Poetry	3
FL/FR 449 Practicum in Tutoring	1-2
Electives chosen from the following	7-10
Eng 441 Introduction to Study of Language	
FL/EN 243 English Word Origins	
Approved upper-division course in literature	
Approved upper-division French electives	

B. 22-CREDIT FRENCH TEACHING MINOR

Course	Credits
FL/FR 101-102 Elementary French	8
FL/FR 201-202 Intermediate French	8
Approved upper-div French electives (either FL/FR 301 or 302 is reqd; lab-based and lit in translation courses are not acceptable)	6

Note: A minor in French of less than 22 credits is not acceptable.

GEOGRAPHY

A. 30-CREDIT GEOGRAPHY TEACHING MAJOR

Course	Credits
Geog 100, 101 Physical Geography & Lab	4
Geog 165 Human Geography	3
Geog 180-181-182 Spatial Graphics	3
Geog 250 World Regional Geography	3
Geog 330 Urban Geog or 240 Econ Geog or 346 Transportation	3
Geog 364 Idaho & Pacific Northwest or 362 U.S. & Canada	3
Geog 401 Atmospheric Environment or 420 Land & Resource Regulation or 427 Decision Making in Resource Management	3
Geog 470 Computer Mapping	3
Additional geography courses to total 30 credits	—

B. 22-CREDIT GEOGRAPHY TEACHING MINOR

Course	Credits
Geog 100, 101 Physical Geography & Lab	4
Geog 165 Human Geography	3
Geog 180-181-182 Spatial Graphics	3
Geog 240 Economic Geography	3
Geog 250 World Regional Geography	3
Geog 401 Atmospheric Environment or 420 Land & Resource Regulation or 427 Decision Making in Resource Management	3
Geog 470 Computer Mapping	3

GEOLOGY

A teaching major in geology is not offered.

20-CREDIT GEOLOGY TEACHING MINOR

Course	Credits
Geol 101, 102 Physical Geology & Lab	4
Geol 106, 107 Historical Geology & Lab	4
Geol 212 Principles of Paleontology	4
Geol 258 Minerals & Rocks	4
Geol 260 Survey of Minerals	2
Geol 261 Survey of Rocks	2
Electives chosen from the following	4
Geol 301 Field Geology & Report Writing	
Geol 335 Geomorphology	
Geol 345 Structural Geology	

GERMAN

Basic language courses taken in high school or elsewhere may be evaluated for college equivalences as part of this teaching major and minor. Consult the Department of Foreign Languages and Literatures for policies on advanced placement.

A. 40-CREDIT GERMAN TEACHING MAJOR

Course	Credits
FL/GN 121-122 Elementary German	8
FL/GN 221-222 Intermediate German	8
FL/GN 321 German Conversation	3
FL/GN 322 German Grammar & Composition	3
FL/GN 325-326 German Culture & Institutions	6
FL/GN 329 German Language Lab or 430 German Phonetics	1-2
FL/GN 449 Practicum in Tutoring	1-2
Electives chosen from the following	6-8
Eng 441 Introduction to Study of Language	
FL/EN 243 English Word Origins	
Approved upper-division German electives	

B. 22-CREDIT GERMAN TEACHING MINOR

Course	Credits
FL/GN 121-122 Elementary German	8
FL/GN 221-222 Intermediate German	8
Approved upper-div German electives (either FL/GN 321 or 322 is reqd; lab-based and lit in translation courses are not acceptable)	6

Note: A minor in German of less than 22 credits is not acceptable.

HEALTH AND DRIVER EDUCATION

A teaching major in health and driver education is not offered. Students minoring in health and driver education who plan to apply for teacher certification must include a course in anatomy and physiology or general biology. A current advanced first aid and emergency care card is required upon graduation.

20-CREDIT HEALTH AND DRIVER EDUCATION TEACHING MINOR

This minor leads to teaching certification in health and driver education.

Course	Credits
H&S 150 Wellness Lifestyles	3
H&S 288 First Aid	2
H&S 289 Drugs in Society or 404 Special Topics	2
H&S 316 School Health Services	2
H&S 323 Health Education Methods	3
H&S 355 Accident Control & Prevention	2
H&S 440, 449 Driver Education I, II	6
HEc 205 Concepts in Human Nutrition	3

HEALTH EDUCATION

A teaching major in health education is not offered. Students minoring in health education who plan to apply for teacher certification must include a course in anatomy and physiology or general biology. A current advanced first aid and emergency care card is required upon graduation.

20-CREDIT HEALTH EDUCATION TEACHING MINOR

Students minoring in health education who plan to apply for teacher certification must include a course in anatomy and physiology or general biology among the courses they select to meet the general studies requirements.

Course	Credits
H&S 150 Wellness Lifestyles	3
H&S 288 First Aid	2
H&S 289 Drugs in Society	2
H&S 316 School Health Services	2
H&S 323 Health Education Methods	3
H&S 404 Special Topics	2
HEc 205 Concepts in Human Nutrition	3
HEc 340 Parent-Child Relationships or RelSt 204 Death & Dying or Bact 154 Principles of Microbiology	3

HISTORY

A. 33-CREDIT HISTORY TEACHING MAJOR

Course	Credits
Hist 101-102 History of Civilization	6
Hist 111-112 Introduction to U.S. History	6
Hist 490 Introduction to Historical Research	3
American government	3
Additional history courses (incl 3 cr of non-regional U.S. history)	15

Note: In selecting upper-division history courses, balance courses in the history of the Americas with courses in European and Asian history. Students who also have a teaching minor in English should take the history of England survey as part of the teaching major.

B. HISTORY TEACHING MINORS

The teaching minor in history includes one course in American government and a minimum of 20 credits in history. Follow the history teaching major (above) in selecting courses. Students who also have a teaching major in English should take the history of England survey as part of the history teaching minor.

C. 33-CREDIT HISTORY TEACHING MAJOR THROUGH AMERICAN STUDIES

American studies majors must take 9 credits in European or Asian history to maintain the required balance of old and new world history, plus 3 credits in American government.

HOME ECONOMICS EDUCATION

The major in home economics education is offered only in the major curriculum leading to the degree of B.S.H.Ec. (see part 5). A teaching minor in home economics education is not offered.

INDUSTRIAL TECHNOLOGY EDUCATION

The major in industrial technology education is offered only under the major curriculum leading to the degree of B.S.Ed. (see part 5).

22-CREDIT INDUSTRIAL TECHNOLOGY EDUCATION TEACHING MINOR

For certification to teach industrial technology education, a teaching minor must contain at least 20 credits, including not less than 15 credits distributed among and including each of the areas of metals, wood, drafting, and electricity-electronics. The remainder may be in allied or related areas. No substitution will be permitted for any of the courses required below.

Course	Credits
ITED 110 Introduction to Technology	2
ITED 120 Principles of Technology	3
ITED 130 Basic Electronics I	3
ITED 250 Introduction to Metals Manufacturing	3
ITED 265 Computer Aided Drafting/Design or Engr 101 Engr Graphics	2
ITED 280 Building Construction Technology	3
ITED 420 Curriculum Dev & Eval in Industrial Technology	3
ITED 472 Industrial Technology Teaching Methods	3

JOURNALISM

A teaching major in journalism is not offered.

20-CREDIT JOURNALISM TEACHING MINOR

Course	Credits
Comm 121 News Writing	3
Comm 140 Mass Media & Society	3
Comm 222 Reporting	3
Comm 325 News Editing	3
Comm 354 Publications Editing	3
Comm 445 History of Mass Communication	3
Journalism electives	2

LATIN

Basic language courses taken in high school or elsewhere may be evaluated for college equivalencies as part of this teaching major or minor. Consult the Department of Foreign Languages and Literatures for policies on advanced placement.

A. 40-CREDIT LATIN TEACHING MAJOR

Course	Credits
FL/EN 211-212 Classical Mythology	4
FL/EN 243 English Word Origins	2
FL/EN 364 Literature of Rome	3
FL/LA 161-162 Elementary Latin or 261-262 Intensive Latin	8
FL/LA 369 Advanced Latin Lab	1-3
A methods course approved by adviser and classics section or FL/LA 449 Practicum in Tutoring	2
Upper-division Latin literature courses (minimum)	9
Electives chosen from the following	9-11
Eng 441 Introduction to Study of Language	
FL/EN 363 Literature of Ancient Greece	
FL/EN 441 Ancient Greek Civilization	
FL/EN 442 Civilization of Ancient Rome	
FL/GK 341, 342 Elementary Greek	
Hist 446 Medieval Europe	
Additional upper-div Latin courses (especially recommended)	

B. 20-CREDIT LATIN TEACHING MINOR

Course	Credits
FL/LA 161-162 Elementary Latin or 261-262 Intensive Latin	8
FL/LA 369 Advanced Latin Lab (minimum)	1
FL/EN 243 English Word Origins	2
FL/EN 364 Literature of Rome	3
Upper-division Latin literature courses	6

Note: A minor in Latin of less than 20 credits is not acceptable.

LIBRARY SCIENCE

A teaching major in library science is not offered.

LIBRARY SCIENCE TEACHING MINOR

The teaching minor in library science must total 24 credits. At least 12 of these must be in the areas of selection, organization, and administration of library materials. This teaching minor will qualify the student for the Idaho K-12 Education Media Generalist endorsement. Because library science is not a teaching field, the teacher-librarian must also qualify for a standard Idaho elementary or secondary teacher's certificate.

Note: Departmental approval and approval of site are required for the practicum; it is approved after the majority of the required course work has been completed.

Course	Credits
LibSc C420 Classification & Cataloging	4
LibSc C421 Acquisitions & Collection Development in Libraries	3
LibSc C422 Use of the School Library and/or C423 Introduction to Reference Work	2-5
LibSc C425 Organization & Management of Small Libraries	4
LibSc 427 Library & Media Center Practicum	1-6
Audiovisual aids and computer electives (minimum)	2
Note: The above selections must total 18 credits	
Courses selected from the following	0-6
Ed 334 Children's Literature (3 cr)	
Eng 445 Literature for Adolescents (3 cr)	
Communication/graphic arts (6 cr)	

MARKETING EDUCATION

The major in marketing education is offered only in the major curriculum leading to the degree of B.S.Bus.Ed. (see part 5). A teaching minor in marketing education is not offered.

MATHEMATICS

Note: Students who plan to apply for teacher certification with a mathematics teaching major must take Ed 418 and 478.
Math 140 and 179 may be necessary prerequisites for students with weak backgrounds.

A. 40-CREDIT MATHEMATICS TEACHING MAJOR

Course	Credits
Math 176 Discrete Mathematics	4
Math 180, 190 Analytic Geometry & Calculus	8
Math 215 Seminar in Topology of the Plane	3
Math 286 Theory of Numbers	3
Math 330 Linear Algebra or 326 Linear Programming	3
Math 390 Postulational Geometry	3
CS 112 Introduction to Problem Solving & Programming	3
Stat 251 Principles of Statistics or Stat 301 Probability & Statistics or Math 451 Probability Theory & Mathematical Statistics	3
Math 200 or mathematics courses numbered above 300	3
Three of the following courses (chosen from courses not already taken—one must be above 400)	9
Math 326 Linear Programming	
Math 330 Linear Algebra	
Math 346 Applied Combinatorics	
Math 376 Discrete Mathematics II	
Math 411 Elementary Topology	
Math 426 Optimization	
Math 461 Abstract Algebra	
Math 462 Abstract Algebra	

Math 471 Advanced Calculus
Math 472 Advanced Calculus

B. 30-CREDIT MATHEMATICS TEACHING MAJOR

Course	Credits
Math 176 Discrete Mathematics	4
Math 180, 190 Analytic Geometry & Calculus	8
Math 286 Theory of Numbers or 215 Seminar in Topology of the Plane	3
Math 326 Linear Programming or 330 Linear Algebra	3
Math 390 Postulational Geometry	3
Math 200 or math courses numbered above 300	3
CS 112 Introduction to Problem Solving & Programming	3
Stat 251 Principles of Statistics or Stat 301 Probability & Statistics or Math 451 Probability Theory & Mathematical Statistics	3
One of the following courses	3
Math 376 Discrete Mathematics II	
Math 411 Elementary Topology	
Math 461 Abstract Algebra	
Math 471 Advanced Calculus	

C. 20-CREDIT MATHEMATICS TEACHING MINOR

Course	Credits
Math 176 Discrete Mathematics	4
Math 180, 190 Analytic Geometry & Calculus	8
Math 286 Theory of Numbers	3
Math 390 Postulational Geometry	3
Stat 251 Principles of Statistics or Stat 301 Probability & Statistics or Math 451 Probability Theory & Mathematical Statistics	3

Note: Students who plan to apply for teacher certification with a mathematics teaching minor must take Ed 478 (Ed 418 is highly recommended).

MUSIC EDUCATION

Majors in music education are offered only in the major curricula leading to the degree of B.Mus. (see part 5).

24-CREDIT MUSIC TEACHING MINOR

Course	Credits
MusA 114 Individual Instruction	1-4
MusA 145-146 Piano Class	2
MusA 387 Conducting I	2
MusC 139-149 Aural Skills I-II	2
MusC 141, 142 Theory of Music I, II	6
MusT 381 Elem School Music Methods I or MusT 385 Choral Music in Sec School or MusT 386 Instrumental Music in Sec School	2-3
Music history courses selected from the following	6
MusH 100 Survey of Music	
MusH 321 Music in Western Civilization I	
MusH 322 Music in Western Civilization II	
MusH 323 Music in Western Civilization III	
Performance classes (depending on emphasis)	3

OFFICE OCCUPATIONS EDUCATION

The major in office occupations education is offered only in the major curriculum leading to the degree of B.S.Bus.Ed. (see part 5).

19-CREDIT OFFICE OCCUPATIONS EDUCATION TEACHING MINOR

Course	Credits
BusEd 102 Typewriting II	2
BusEd 185 Machine Calculation	2
BusEd 395 Administrative Office Procedures	3
BusEd 413 Administrative Office Management	3
BusEd 419 Word Processing	3
BusEd 492 Teaching Business Education II	3
Eng 313 Business Writing	3

OFFICER EDUCATION

20-CREDIT OFFICER EDUCATION TEACHING MINOR

This teaching minor consists of 20 cr in approved courses from aerospace studies, military science, or naval science.

PHYSICAL EDUCATION

Also see athletic training, coaching, dance, exercise specialist, health and driver education, health education, and recreation.

The major in physical education is offered only under the major curriculum leading to the degree of B.S.Ed. (see part 5).

A. 24-CREDIT SECONDARY PHYSICAL EDUCATION TEACHING MINOR

Students who plan to apply for teacher certification must take first aid and anatomy or physiology. These requirements may be met by taking H&S 288 and Zool 119.

Course	Credits
PE 112, 113, 115, 117, 118, or 120 Skill & Analysis	1
PE 114, 116, or 119 Skill & Analysis	1
PE 201 Fitness Activities & Concepts	2
PE 300 Human Kinesiology or 418 Physiology of Exercise	2-3
PE 320 Methods & Materials in Physical Education	3
PE 321 Physical Education Teaching Lab	1
PE 380 Measurement & Evaluation	3
PE 424 Physical Education for Special Populations	3
PE 440 Physical Education & Sport Management	3
Dan 112 Basic Dance Forms or PE 202 Skill & Analysis: Tumbling & Gymnastics	2-3
H&S 150 Wellness Lifestyles	3

B. 23-CREDIT ELEMENTARY PHYSICAL EDUCATION TEACHING MINOR

Students who plan to apply for teacher certification must take anatomy and physiology. This requirement may be met by taking Zool 119.

Course	Credits
PE 106 Tumbling & Rhythmic Gymnastics	1
PE 114, 116, or 119 Skill & Analysis	1
PE 250 Elementary Physical & Health Education	3
PE 260 Motor Learning	3
PE 380 Measurement & Evaluation	3
PE 424 Physical Education for Special Populations	3
PE 440 Physical Education & Sport Management	3
Dan 220 Children's Dance	2
H&S 288 First Aid	2
Rec 243 Recreation Activities	2

PHYSICAL SCIENCES

40-CREDIT COMPOSITE TEACHING MAJOR

This is a 40-credit composite teaching major consisting of courses in chemistry, geology, and physics. It must include at least 18 credits in chemistry or physics and a minimum of 8 credits in each of these two fields. A teaching minor in mathematics is recommended to accompany this teaching major.

Course	Credits
Biol 100 Intro to Biology or Biol 201 Intro to the Life Sciences or Geog 100 Physical Geog or Geog 401 Atmospheric Environment	3-4
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
Chem 275 Carbon Compounds	3
Geol 101-102 Physical Geology & Lab	4
Phys 103 General Astronomy	3
Phys 210, 211, 222 Engineering Physics I, II, III	9
Phys 212, 213 Engineering Physics Lab	2
Phys 225 Introductory Physics Lab	1
Phys 411 Physical Instrumentation I	3
Additional courses in chemistry, geology, or physics to complete distribution required above	—

Recommended electives:

Biochem 380 Introductory Biochemistry
Chem 302 Principles of Physical Chemistry

PHYSICAL SCIENCE-LIFE SCIENCE

60-CREDIT COMPOSITE TEACHING MAJOR

Course	Credits
Biol 201 Introduction to the Life Sciences	4
Biol 202 General Zoology	4
Biol 203 General Botany	4
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
Phys 210, 211, 222 Engineering Physics I, II, III	9
Phys 212, 213 Engineering Physics Lab	2
Phys 225 Introductory Physics Lab	1
Phys 411 Physical Instrumentation I	3
Zool 119 Human Anatomy & Physiology	5
Courses in biology, chemistry, or physics	8
Electives chosen from the following	11
Bact 250 General Microbiology	
Biol 207 Introduction to Oceanography	
Biol 331 General Ecology	
Geog 100, 101 Physical Geography & Lab	
Geog 401 Atmospheric Environment	
Inter 394 Technology & Societal Decisions	
Inter 490 Technology & Human Values	
Phys 103 General Astronomy	

PHYSICS

A. 40-CREDIT PHYSICS TEACHING MAJOR

Course	Credits
Phys 103 General Astronomy	3
Phys 210, 211, 222 Engineering Physics I, II, III	9
Phys 212, 213 Engineering Physics Lab	2
Phys 225 Introductory Physics Lab	1
Phys 360 Introduction to Modern Physics	3
Phys 411 Physical Instrumentation I	3
Biol 201 Introduction to the Life Sciences	4
Chem 103 Intro to Chemistry or 111 Prin of Chemistry	4
Math 180, 190, 200 Analytic Geometry & Calculus	11

B. 20-CREDIT PHYSICS TEACHING MINOR

Course	Credits
Phys 210, 211, 222 Engineering Physics I, II, III	9
Phys 212, 213 Engineering Physics Lab	2
Phys 225 Introductory Physics Lab	1
Phys 360 Introduction to Modern Physics	3
Electives in physics (approved by adviser in Dept of Physics), including at least 2 credits of lab work	5

POLITICAL SCIENCE

A. 30-CREDIT POLITICAL SCIENCE TEACHING MAJOR

The distribution of credits among the five fields below must be as follows: (1) 12-15 credits in U.S. government and political process, including PolSc 101, Introduction to American Politics, and (2) 15-18 credits in the other four fields, including at least 3 credits in each field. Courses listed in more than one field may be counted in only one of those fields. Substitutions in specific courses may be made with the consent of the adviser. All 30 credits must be in political science courses; however, note that 6 additional credits in history are also required for certification in this field.

U.S. Government: Process and Policy

PolSc 101, Introduction to American Politics
And 9-12 cr from the following: PolSc 275, 431, 432, 433, 437, 439, 460, 464, 465, 469

Comparative Government and Politics

At least 3 credits from the following:
PolSc 380, 381, 382, 447, 480, 482, 483, 484, 485, 487

International Relations

At least 3 credits from the following:
PolSc 237, 438, 440, 449

Public Administration and Public Law

At least 3 credits from the following:
PolSc 360, 451, 452, 454, 467, 468, 469

Political Thought

At least 3 credits from the following:
PolSc 425, 426, 428, 429

B. TEACHING MINOR IN POLITICAL SCIENCE

The teaching minor in political science is a minimum of 20 credits. Six additional credits of U.S. history are also required for certification in this field.

Course	Credits
PolSc 101 Introduction to American Politics	3
Three additional credits in U.S. govt (see the list of courses in U.S. Govt: Process and Policy under teaching major above)	3
Three credits in comparative govt (see the list of courses in Comparative Govt and Politics under teaching major above)	3
Other political science courses selected from those listed in the teaching major	11

PSYCHOLOGY

A. 30-CREDIT PSYCHOLOGY TEACHING MAJOR

The basic objective of this teaching major is to provide the undergraduate student with preparation that leads to teaching psychology in secondary schools, and/or to undertake graduate work in several related areas. Though psychology is certifiable, it is desirable to present two teaching minors in standard secondary-school subjects. At least a teaching minor in sociology/anthropology is recommended for those anticipating graduate work in guidance and counseling and school psychology. A second teaching major in lieu of two teaching minors is acceptable preparation. The composite teaching majors (e.g., social science or physical science), if elected as a second teaching major, should meet the stipulated credit requirement.

Course	Credits
Psych 100 Introduction to Psychology	3
Psych 218 Introduction to Research in Behavioral Science	4
Psych 305 Developmental Psychology	3
Psych 310 Psych of Personality or 455 Psych of Motivation	3
Psych 311 Abnormal Psychology	3
Psych 320 Introduction to Social Psychology	3
Psych 372 Physiological Psychology or 444 Sensation & Perception	3
Psych 390 Psychology of Learning or 325 Cognitive Psychology	3
Psych 400 Seminar	2-3
Stat 251 Principles of Statistics	3

B. 20-CREDIT PSYCHOLOGY TEACHING MINOR

Course	Credits
Psych 100 Introduction to Psychology	3
Psych 218 Introduction to Research in Behavioral Science	4
Psych 305 Developmental Psychology	3
Psych 390 Psychology of Learning	3
Stat 251 Principles of Statistics	3
Approved psychology electives	4

RECREATION

The major and minor in recreation are outlined in part 5.

SOCIAL SCIENCE

A. 45-CREDIT COMPOSITE TEACHING MAJOR

Note: Due to extensive course overlap, social science majors may NOT select history as a second major or as a minor.

This 45-credit composite teaching major requires a minimum of 15 approved credits in history and at least 6 approved credits each in economics, geography, political science, and sociology or anthropology (all 6 credits in either sociology or anthropology). The remaining 6 credits are to be distributed among any two of these areas (excluding history and treating sociology and anthropology as one area). Required and other approved courses include:

History—Hist 101, 102, 111, 112, and one or more courses in modern U.S. or European history.
Economics—Econ 151 and 152, then 435 or 490.
Geography—Geog 165, 250, 330 (choose two or more).
Political Science—PolSc 101 and choose one or more from 275, 381, 382.
Sociology—Soc 110 and any other sociology course (excluding courses on social welfare and services).
Anthropology—Anthr 100 and any other anthropology course.

B. 45- OR 60-CREDIT TEACHING MAJOR THROUGH AMERICAN STUDIES

American studies majors add Hist 101, 102, 111, 112, and one or more courses in modern U.S. or European history. Also follow the credit distributions and recommended courses as stated above for economics, geography, political science, and sociology or anthropology.

SOCIOLOGY/ANTHROPOLOGY

A teaching major in sociology/anthropology is not offered.

20-CREDIT SOCIOLOGY/ANTHROPOLOGY TEACHING MINOR

Course	Credits
Anthr 100 Introduction to Anthropology	3
Anthr 220 Peoples of the World or 329 North American Indians	3
Soc 110 Introduction to Sociology	3
Soc 230 Social Problems	3
Approved electives in anthropology and sociology	8

SPANISH

Basic language courses taken in high school or elsewhere may be evaluated for college equivalencies as part of this teaching major and minor. Consult the Department of Foreign Languages and Literatures for policies on advanced placement.

A. 40-CREDIT SPANISH TEACHING MAJOR

Course	Credits
FL/SP 181-182 Elementary Spanish	8
FL/SP 281-282 Intermediate Spanish	8
FL/SP 381-382 Advanced Spanish Grammar & Composition	6
FL/SP 383-384 Hispanic Culture & Institutions	6
FL/SP 389 Spanish Language Lab or 400 Seminar in Phonetics	1-3
FL/SP 449 Practicum in Tutoring	1-2
FL/SP 493 Spanish for Teachers	2
Electives chosen from the following Eng 441 Introduction to Study of Language FL/EN 243 English Word Origins Approved upper-division Spanish electives	5-8

B. 22-CREDIT SPANISH TEACHING MINOR

Course	Credits
FL/SP 181-182 Elementary Spanish	8
FL/SP 281-282 Intermediate Spanish	8
Approved upper-div Spanish electives (either FL/SP 381 or 382 reqd; lab-based and lit in translation courses are not acceptable)	6

Note: A minor in Spanish of less than 22 credits is not acceptable.

SPECIAL EDUCATION

The major in special education is offered only in the major curriculum leading to the degree of B.S.Ed. (see part 5).

20-CREDIT SPECIAL EDUCATION TEACHING MINOR

Course	Credits
SpEd 190, 290, or 390 Special Education Lab	2
SpEd 275 Education of Exceptional Individuals	3
Approved special education electives (may incl SpEd 323, 377, 378, 425)	15

Note: This minor is designed for individuals preparing to work in fields ancillary to special education. It is not intended for those who are interested in teaching the exceptional child. It is not a subject area minor for secondary certification purposes.

SPEECH

A. 30-CREDIT SPEECH TEACHING MAJOR

Course	Credits
CommG 131 Fundamentals of Public Speaking	2
CommG 132 Oral Interpretation	2
CommG 134 Nonverbal Communication	2

CommG 232 Parliamentary Law & Procedure	1
CommG 233 Interpersonal Communication	3
CommG 331 Conflict Management	3
CommG 332 Communication & the Small Group	3
CommG 333 Interviewing	3
CommG 335 Organizational Communication	3
Comm 140 Mass Media & Society	3
Comm 431 Professional Presentation Techniques	3
Comm 441 Ethics in Mass Communication	3

B. 20-CREDIT SPEECH TEACHING MINOR

Course	Credits
CommG 131 Fundamentals of Public Speaking	2
CommG 132 Oral Interpretation	2
CommG 232 Parliamentary Law & Procedure	1
CommG 233 Interpersonal Communication	3
CommG 331 Conflict Management	3
CommG 332 Communication & the Small Group	3
Courses selected from those specified for the speech teaching major	7

THEATRE ARTS

A. 40-CREDIT THEATRE ARTS TEACHING MAJOR

Course	Credits
ThA 100 Theatre Process & Production	3
ThA 102 Theatrical Makeup	2
ThA 103 Introduction to Stagecrafts	3
ThA 104 Advanced Stagecrafts	3
ThA 105-106 Basics of Performance	4
ThA 150 Performance Lab	1
ThA 271 Play Analysis	3
ThA 272 Intermediate Acting	3
ThA 301-302 Visual Theatre & Design	6
ThA 381 Drama in Education	3
ThA 467-468 The Theatre	6
ThA 471 Directing	3

B. 25-CREDIT THEATRE ARTS TEACHING MINOR

Course	Credits
ThA 100 Theatre Process & Production	3
ThA 103 Introduction to Stagecrafts	3
ThA 104 Advanced Stagecrafts	3
ThA 105-106 Basics of Performance	4
ThA 301-302 Visual Theatre & Design	6
ThA 381 Drama in Education	3
ThA 471 Directing	3

THEATRE ARTS-SPEECH

40-CREDIT COMPOSITE TEACHING MAJOR

Course	Credits
CommG 131 Fundamentals of Public Speaking	2
CommG 132 Oral Interpretation	2
CommG 134 Nonverbal Communication	2
CommG 232 Parliamentary Law & Procedure	1
CommG 233 Interpersonal Communication	3
CommG 331 Conflict Management	3
CommG 332 Communication & the Small Group	3
Comm 431 Professional Presentation Techniques	3
ThA 103 Introduction to Stagecrafts	3
ThA 104 Advanced Stagecrafts	3
ThA 105-106 Basics of Performance	4
ThA 301-302 Visual Theatre & Design	6
ThA 381 Drama in Education	3
ThA 471 Directing	3

TRADE AND INDUSTRIAL/TECHNICAL EDUCATION

Trade and industrial/technical education are offered only in the major curriculum leading to the degree of B.S.Ed. (see part 5). Teaching minors in trade and industrial/technical education are not offered.

College of Engineering

Richard T Jacobsen, Dean (125 Janssen Engr. Bldg.); Weldon R. Tovey, Associate Dean; James H. Milligan, Associate Dean; Steven G. Penoncello, Assistant Dean.

The mission of the college is to prepare students for professional practice, admission to advanced degree programs, leadership in the profession, and lifelong learning; to promote the discovery, development, and dissemination of knowledge through excellence in research; and to contribute to the economic development of the state, region, and nation. To this end, the college provides statewide access to high quality educational programs leading to baccalaureate and advanced degrees in engineering and computer science as described below.

The Engineering Profession

Members of the engineering profession use their knowledge of mathematics and the sciences to create useful and economic devices, structures, and systems for the benefit of the human race. The engineer's talents are used in many ways: design, construction, and operation of public works and utilities systems; planning, construction, and operation of industrial processes and equipment; application of technical products; and creation of devices and systems needed for the support of all human activity, such as food production, transportation, communication, and control of the environment. Many engineers hold responsible managerial positions; others are key members of the interdisciplinary teams that solve the complex technical, economic, and social problems of the world.

The engineering profession recognizes that social, economic, political, and cultural, as well as technical considerations are involved in most of the works in which the modern engineer is engaged. A part of an engineer's education is devoted to the humanities and the social sciences to help him or her relate the technical preparation received to the world today and enhance the engineer's role as an educated, responsible citizen.

To qualify as an engineer, one usually undertakes a four-year college program leading to a Bachelor of Science (B.S.) degree in one of the major branches of engineering practice. Bachelor of Science graduates may either go directly into engineering employment or proceed to graduate study to pursue a given area of interest in depth. As the technology of engineering includes a wide range of subject matter that can be explored only to a limited extent in an undergraduate program, more and more students undertake graduate study for better preparation in a specific field before seeking employment as practicing engineers.

All states require that engineers engaged in work affecting public health and welfare be licensed or registered. This requires a qualifying examination in fundamentals of engineering, usually taken upon completion of undergraduate study, and a period of practical experience followed by a second qualifying examination in the practice of engineering. Many industries, while not legally required to use registered engineers, encourage registration as evidence of professional stature of their engineering employees.

The Computer Science Profession

Although much of the above applies to computer science, it is a profession with its own merits. Computer science is the systematic study of algorithmic processes that describe and transform information. It includes analysis, design, implementation, and application of computer software and computing systems; hardware selection; and language development and modification. Computer scientists work alongside engineers, scientists, and businessmen to provide faster and more efficient ways to calculate, record, manipulate, store, and use all kinds of information. Applications range from data base operations to sophisticated calculation and computer-aided design systems. Refer to the section on the Department of Computer Science in part 5 and/or write to the department for additional information.

Equal Opportunity

The degree programs of the college and the professions they represent actively seek out women and under-represented minorities. Opportunities are unlimited and an increasing number are entering the professions.

Preparation and Admission

A statement of admission requirements is included in part 2. A student may be admitted with less than the requirements listed, but

the deficiency must be made up before he or she can progress very far in a college engineering course of study.

Students who contemplate entering the College of Engineering with advanced standing from other institutions should complete as many of the freshman and sophomore requirements listed in the curricula as possible. Calculus and the various engineering science courses are prerequisites to many advanced courses, and their omission may delay graduation.

Students from out-of-state institutions who wish to transfer to a degree program offered by the College of Engineering are invited to apply. Those whose cumulative GPA is below 2.8 for all previous college-level courses, including any courses taken at UI, may be admitted on approval of the College of Engineering Admissions Committee.

Admission to Classes

As a prerequisite to any upper-division course normally taken in the junior or senior year and offered by the College of Engineering, students in the College of Engineering must have completed selected courses from the required courses in chemistry, computer science, engineering, mathematics, and physics that are normally to be taken by them during their first two years and must have attained a grade of C or better in each of those courses.

Scholarships and Awards

Many scholarships and awards are available to College of Engineering students and prospective students. See "Financial Aid" and "Special Awards" in the student service section of part 2.

Courses of Study and Degrees

The College of Engineering includes the degree-granting Departments of Agricultural, Chemical, Civil, Electrical, and Mechanical Engineering, and of Computer Science. Careful attention is given to curriculum content and educational philosophy to keep all programs attuned to rapidly changing technology. All engineering B.S. degree programs on the Moscow campus are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (EAC/ABET) except computer engineering, which is a new program in 1988 and has not yet applied for accreditation.

Programs in the college lead to the Bachelor of Science in seven disciplines, i.e., Bachelor of Science in Agricultural Engineering, Bachelor of Science in Chemical Engineering, Bachelor of Science in Civil Engineering, Bachelor of Science in Computer Engineering, Bachelor of Science in Electrical Engineering, Bachelor of Science in Mechanical Engineering, and Bachelor of Science in Computer Science.

The Bachelor of Science programs in engineering disciplines are designed to prepare the student either for immediate entry into the profession or for graduate study. Most of the courses taken by freshmen and sophomores are the same in all curricula. The student may postpone a final decision on a branch of study for a year or more with little, if any, consequence, thus allowing ample opportunity for professional orientation. The junior and senior years are devoted to application of basic principles in the various fields of practice.

Courses of study leading to the degrees of Master of Science (M.S.), Master of Engineering (M.Engr.), and Doctor of Philosophy (Ph.D.) are offered in agricultural, chemical, civil, electrical, and mechanical engineering. The M.S. and M.Engr. degrees are available in computer engineering, and the M.S. degree is available in computer science. The Master of Engineering in engineering management is also available. Through the facilities at the UI/Idaho Falls Center for Higher Education, the M.S., M.Engr., and Ph.D. degrees are available in nuclear engineering. The requirements for graduate degrees are outlined in the *Graduate Bulletin.*

Faculty

The faculty is the key to the quality of the engineering program. With few exceptions, faculty members in this college hold advanced engineering degrees; more than 70 percent hold the Ph.D. degree. Recognition in such publications as *Who's Who in America, Who's Who in the West, Who's Who in Engineering,* and *American Men and Women of Science* is common.

A distinguishing feature of the faculty is a blend of academic and practical experience. Many faculty members have extensive experience in practice that they bring into the classroom. This is valuable in preserving a balance between theoretical and practical aspects of engineering.

Facilities

The facilities of the College of Engineering are among the finest in the country. Work is centered in the block-square engineering complex, which includes the Allen S. Janssen Engineering Classroom Building and the J. E. Buchanan, J. Hugo Johnson, and Henry F. Gauss Engineering Laboratories. These facilities are supplemented by the agricultural engineering and isotopes laboratories at other locations on the campus. In total, more than 175,000 square feet of floor space is available for the special use of the College of Engineering. Laboratories include modern equipment for teaching and research in all areas of instruction with recent additions for computerized drafting, CAD/CAM, computerized VLSI design, and robotics. Some of the equipment is of advanced design found in only a few institutional laboratories. A microcomputer laboratory is reserved exclusively for student use. Students also have access to the University IBM 4341 and 4381 computing system, an assortment of Hewlett Packard minicomputers and engineering work stations, and various types of smaller computers.

Standing and Advantages

With a tradition of excellence dating from the founding of the University of Idaho, the College of Engineering has developed engineering bachelor's degree programs on the Moscow campus that are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology as listed previously. In recent years, degree programs in several disciplines have been made available at off-campus sites as well. Since 1896, when it granted its first degrees, graduates of the college have spread throughout the world. The large number of firms and agencies from throughout the country that send interviewers to the campus each year seeking to hire Idaho engineering graduates attest to the reputation of the university's engineering program.

The size of the college is near the median of engineering colleges in the country. It is not so large that the importance of the student as an individual is lost; it is large enough to support the faculty and facilities needed for top quality education.

Attention is given to both undergraduate and graduate programs. New concepts and knowledge resulting from the graduate program feed into the undergraduate program to keep it up to date. Undergraduate students have an opportunity to observe graduate projects to help them ascertain their interest in graduate work so that the student is better prepared and more soundly motivated if he or she does proceed to graduate work.

Engineering Experiment Station

The function of the Engineering Experiment Station is to encourage and coordinate the College of Engineering's research and extension programs that are integral parts of the college's academic and service efforts.

The research program in engineering is conducted by the regular faculty and students of the college. There is neither a separate research facility nor a separate research staff. The College of Engineering requires that any research it undertakes have academic significance. A large part of the college's research program deals

with developing new knowledge that is applicable to Idaho's economy or devising new methods or applications for using existing knowledge to the benefit of the state. Most of the funds in support of research come from sources other than legislative appropriations. These funds are the result of research contracts and grants with various local, state, and federal agencies and private industry. Information regarding research capabilities is available upon request.

Believing that education is a never-ending need of man, the College of Engineering, through the means of short courses, workshops, seminars and forums, and pertinent publications, attempts to ascertain and meet the specific continuing education needs of Idaho's graduate engineers, computer scientists, and the technical community. Staff members also endeavor to provide information to the entire population of Idaho that may contribute to the successful solving of societal problems.

Off-Campus Programs

To fulfill its charge to provide engineering education to the people of Idaho, the College of Engineering provides several degree programs off campus. The Engineering in Boise program offers B.S. and M.S. degrees in electrical and computer engineering and some course work in mechanical and civil engineering. Graduate degrees are available in all disciplines at the Idaho Falls Center for Higher Education, as well as the B.S. degree in computer science. Graduate course work in electrical engineering is offered in Pocatello, and the Engineering Education Outreach program uses video technology to provide graduate and advanced undergraduate course work, including some complete master's degrees, at any location. For more information, see "Resident Instruction Centers" in part four.

General Requirements for Graduation

University Requirements. See regulation J in part 3 for requirements that all students in the university must meet.

College Requirements. The civil engineering and electrical engineering curricula require 129 semester credits and the mechanical engineering curriculum 131. All others require a total of 128 semester credits.

Note: In calculating the credit total for engineering degrees, the College of Engineering does not include credits that a student may have been required to earn in Eng 103, Math 140, and any courses taken to remove deficiencies.

FIRST AND SECOND YEAR COURSES COMMON TO ENGINEERING CURRICULA (EXCEPT COMPUTER ENGINEERING AND COMPUTER SCIENCE)

Course	Credits
Chem 111 Principles of Chemistry	4
Chem 114 General Chemistry	4
CS 105 FORTRAN Programming for Engineers (majors in elec engr take CS 112 instead of 105)	2
Eng 104 Essay Writing	3
Engr 101 Engineering Graphics	2
ES 210 Engineering Statics	3
Math 180, 190, 200 Analytic Geometry & Calculus I, II, III	11
Math 310 Ordinary Differential Equations	3
Phys 210, 211 Engineering Physics I, II	6

Major Curricula

The curriculum for each major, beyond the freshman and sophomore courses common to engineering curricula, is listed in part 5. Each curriculum provides for electives to be arranged in consultation with the student's adviser in accordance with the student's interest and consistent with current department and college policies. The electives are intended to provide flexibility in the student's program. Undesignated electives will usually be taken outside of the student's major field of study.

College of Forestry, Wildlife and Range Sciences

John C. Hendee, Dean (202 Forestry, Wildlife and Range Sciences Bldg.); Ernest D. Ables, Associate Dean; Leon F. Neuenschwander, Associate Dean; Karel J. Stoszek, Secretary of the College Faculty.

Professional education leading to a degree in forestry began at the University of Idaho in 1909. To the initial curriculum in forest resources have been added those in forest products (1914), range resources (1917), wildlife resources (1942), fishery resources (1951), and resource recreation and tourism (formerly wildland recreation management) (1974).

The academic objective of the college is to provide its students with opportunities to become better prepared for lives of responsibility and fulfillment and to acquire competence for entry into professional careers in natural resource science and management. Each of the curricula offered by the college acquaints the student with the physical, biological, and social sciences and with the humanities, thus establishing a basis of general education and preparing the student for the scientific-professional courses addressing the use of forest and range lands and related resources. In addition to the most modern technical and academic classroom instruction, the college prides itself in "hands-on" training taking advantage of its outstanding field facilities and its emphasis on communications and student activities to enhance leadership potential.

Advantages of Location

The university is ideally located for preparing students for the renewable natural resources professions. Forest and range lands comprise 90 percent of the state's area. Forested areas include many types from the ponderosa pine in southern Idaho to the mixed coniferous and famous white pine of northern Idaho. Range lands vary from spring-fall and winter ranges in the sagebrush-grass and bunchgrass zones to summer ranges in several of the forested zones. Within the forest and range lands are hundreds of lakes and streams and extensive wilderness areas that provide habitat for fish and wildlife and opportunities for wildland recreation.

The values derived from these resources include wood products of all types; cattle and sheep in great numbers; abundant wildlife of many species; world renowned game fish; water for domestic use, power, and irrigation; and recreational activities. These natural study areas and resources are available to the student in preparing for his or her profession.

Facilities

A modern three-story, 90,000-square-foot building, the Forestry, Wildlife and Range Sciences Building incorporates classrooms, laboratories, scientific equipment, plant and animal collections, computer access, and other support functions into an ideal environment for natural resources education and research.

A university experimental forest includes 7,200 acres of forest land located about 25 miles from the campus and is managed by the college as a working forest for demonstration, research, and education. The forest properties include a 200-acre recreation area, a 33-acre privately owned nature preserve, and two smaller tracts closer to Moscow that serve as outdoor classrooms. The Frank Pitkin Forest Nursery site includes 40 acres and three greenhouses produce 750,000 seedlings annually for student training and research purposes. On the university campus, the Shattuck Arboretum, with over 60 species of trees, provides an outdoor classroom for studies in dendrology and silvics. Other field facilities include the McCall Field Campus located on Payette Lake in the mountains of west-central Idaho, the Clark Fork Field Campus in northern Idaho, the Taylor Ranch Wilderness Field Station in the heart of the Frank Church River-of-No-Return Wilderness, and the Lee A. Sharp Range Experimental Area in southern Idaho. In addition, Idaho's 37 million acres of public forest and range lands con-

stitute a vast natural laboratory for students in all of the college's curricula.

To take advantage of these facilities and implement "hands-on" training, the college employs student logging, surveying, planting, and controlled burning crews.

Standing of the College

To promote high professional standards in forestry education, the Society of American Foresters periodically evaluates all forestry schools and rates them as accredited or not accredited. Forestry education at UI has always been accredited, assuring the student of a high quality education. Similarly, in 1985 the range resources curriculum became one of the first in the nation to be accredited by the Society for Range Management.

Departments

The college has five departments: Fish and Wildlife Resources, Forest Products, Forest Resources, Range Resources, and Resource Recreation and Tourism. Although these departments are separate administrative entities, they share a common philosophy: integrated resource management. Many of the faculty members hold joint appointments in more than one department; student programs include courses in more than one department; and the teaching, research, and service missions of all the departments are integrated and coordinated at the college level. This integration is enhanced by the Forest, Wildlife and Range Experiment Station, described below.

Degrees

Curricula leading to the following degrees are offered by the college: Bachelor of Science in Fishery Resources (B.S.Fish.Res.) with options in management and aquaculture; Bachelor of Science in Forest Products (B.S.For.Prod.) with options in forest products business management, timber harvesting, pulp and paper technology, wood construction and design; Bachelor of Science in Forest Resources (B.S.For.Res.) with options in management, administration, and science; Bachelor of Science in Range Resources (B.S.Range Res.) with emphasis areas in management and science; Bachelor of Science in Resource Recreation and Tourism (B.S.Rec.Rc.) with minors in natural resource communication, wilderness and nature conservation, tourism and leisure enterprises, outdoor recreation leadership, or any other university minor; and Bachelor of Science in Wildlife Resources (B.S.Wildl.Res.) with options in quantitative sciences, habitat, aquatics, communications, policy, law and administration, and biology; Master of Science (thesis and nonthesis options); and Master of Forestry, with majors in several of the areas represented by bachelor's degrees; and Doctor of Philosophy, with dissertation topics in any of the five departments.

Admission Requirements

General. For a statement of admission requirements, see part 2.

Transfer Students. Students who propose to complete a portion of their undergraduate studies at a junior college, or elsewhere, before entering UI, should follow as closely as possible one of the curricula for the first two years set forth in part 5. A student whose program does not closely approximate one of these will not be able to graduate in four years. Transfer to UI before the end of the sophomore year is usually to the student's advantage. Correspondence with the dean of the college should be initiated at least three months before the date on which the student plans to enroll.

Total time to graduation will also be extended if field ecology, in those curricula that require it, is not completed during the summer at the end of the sophomore year. Students planning to elect one of these curricula may report directly to the field campus for their initial registration in the university if prerequisites have been met.

Undergraduate Program

The undergraduate curricula are designed to provide both a general and a professional education. The objective in the first two years is to provide students with a good foundation in the biological, physical, and social sciences and in writing and speaking skills. The basic philosophy of the college is to educate according to the principles of integrated resource management while providing specialization in the student's major area of interest.

The curricula and options in each department offer as many courses in common with those in other departments as possible, while ensuring that specific professional education requirements are met. Flexibility and individuality in each student's program are provided by curriculum choice, by options within curricula, and by elective credits. Provision is also made for advanced training leading to a military commission.

A variety of scholarships are available to undergraduate students based on need and merit.

Graduate Program

Programs leading to advanced degrees are offered in each of the fields represented by the undergraduate curricula of the college. Both the master's and the doctor's degree, with emphasis on conducting a research project and preparing a thesis or dissertation, are available. A nonthesis master's degree may also be obtained.

Excellent facilities and opportunities are available for graduate study and research in the subject-matter areas. Research in the college is organized through the Idaho Forest, Wildlife and Range Experiment Station. Research is also supported by the Idaho Cooperative Fish and Wildlife Research Unit, the Cooperative Park Studies Unit, the Wilderness Research Center, and by various state, federal, and private organizations.

Assistantships and fellowships are available to assist highly qualified students in their graduate programs.

More complete information on graduate studies may be obtained by writing the dean of the College of Graduate Studies and requesting a copy of the *Graduate Bulletin.* Specific information on specializations available and projects under way may be obtained by writing the director of graduate programs, College of Forestry, Wildlife and Range Sciences.

Requirements for Graduation

University Requirements. See regulation J in part 3 for general university requirements for degrees.

College Requirements. A total of 136 semester credits is required for the baccalaureate degree. A minimum cumulative grade-point average of 2.00 in all courses taken in this college is required for graduation. Courses in the college numbered above 299 are not open to any undergraduate student who is on academic probation.

Students who are admitted without the required unit of high school physics (see the admission requirements listed in part 2) and who select a curriculum that has no specified physics requirement must take either Phys 101 or 113, regardless of whether physics is listed as a requirement in the chosen curriculum. Courses taken to make up high-school deficiencies will not count toward the 136 semester hours required for the bachelor's degree.

The college may permit substitutions or grant waivers of specified requirements. Thus, for a student with special aptitudes or interests, a program can be devised that will provide a foundation for advanced study or research or meet other acceptable and well-defined career objectives.

All electives are subject to the approval of the faculty adviser and the dean.

Summer Camp or Summer Employment Requirements. Students who elect the forest resources or range resources curriculum are required to complete a four-credit summer field course in

wildland ecology. They must complete this requirement before beginning the professional course work of their upper-division programs. Resource recreation and tourism students may choose the summer course or a two-course ecology sequence during the regular school year.

Students who elect the fishery or wildlife resources curriculum must complete at least one summer of experience in employment deemed by the faculty to be appropriate to their professional career objectives.

Idaho Forest, Wildlife and Range Experiment Station

All members of the college faculty are on the staff of the experiment station. Other members of the station staff include full-time research associates and technicians, as well as graduate-student appointees.

The program of the experiment station is closely connected with the graduate training program of the college. Many of the graduate students enrolled in the college are on assistantships associated with station projects.

The station staff conducts research on a wide variety of renewable natural resource management problems in the areas of forestry, forest products, range, resource based recreation, resource based tourism, wildlife, and fisheries. Several projects are interdisciplinary. Funds for the station are provided by the university, by some departments of the state of Idaho, and by grants from federal, other state, and private sources. Currently a majority of these funds comes from non-university sources. More information on station activities may be obtained by writing to the associate director, Idaho Forest, Wildlife and Range Experiment Station, College of Forestry, Wildlife and Range Sciences.

College of Law

Sheldon A. Vincenti, Dean (101 Law Bldg.); Arthur D. Smith, Jr., Associate Dean.

The College of Law was organized in 1909 and is the only school devoted to the study of law in the state of Idaho. The college is a member of the Association of American Law Schools and is approved by the Council of the Section of Legal Education and Admissions to the Bar of the American Bar Association.

Purpose of the College

The role of the College of Law is to educate students for the legal profession with its many facets and its involvement in the whole range of society. The curriculum is designed to provide instruction over three academic years in principles generally applicable in the United States. The responsibilities assumed by the professional man or woman are emphasized, as are solutions to ethical problems. The study of law is also an asset to those who wish to hold positions of leadership in government or business.

Methods of instruction are adapted to the development of each student's highest potential and vary with the professor and the course. Basic instruction is accomplished primarily by way of the case system, a study of the actual decisions of appellate courts, supplemented by selected readings that provide insight into the nature of judicial and legislative processes. Problem and simulation methods are used in advanced courses. Techniques that encourage individual initiative and develop perception and communication abilities are emphasized. In the third year, clinical training provides contact with clients. Because law changes rapidly, mere accumulation of information is subordinated to the more important ends of individual development and training in critical habits of thought.

Admission to the Bar

The College of Law is fully accredited by the American Bar Association and the Association of American Law Schools, and its degree is accepted by all state bar associations. Educational prerequisites vary among states, and inquiry should be made of the secretary of the bar examiners in the state in which the applicant intends to practice to determine the existence of special requirements.

Prelegal Work

The subject matter of prelegal education is less important than the quality of work performed. Students preparing to enter law school should avoid courses that are not demanding and take those that will develop their powers of analytical thought. Intensive work will enable them to acquire the intellectual discipline and experience necessary for success in law school. Students should aspire to a critical appreciation of values and of political, economic, and social institutions; they should stress understanding, not just knowledge, in their studies. Words are the tools of the lawyer, and a major undergraduate objective in the selection both of courses and of activities outside the classroom should be development of the ability to communicate orally and in writing.

The most common undergraduate majors for law students are the social sciences or business administration. However, a degree in one of these fields is not required and many students with other backgrounds ranging from agriculture to engineering or physics are also accepted. While study of accounting is not a prerequisite for admission to the College of Law, it is highly recommended that prelaw students gain some understanding of the fundamentals of this area. As a rule, the introductory course on a college level is sufficient. Another useful skill is the ability to operate a typewriter/computer with reasonable speed and accuracy.

Within the particular college or university, prelaw advisers are available to guide students in selecting courses that will meet these objectives. The faculty of the College of Law is also available to assist in program planning.

Requirements for Admission

An applicant for admission must have a bachelor's degree from an accredited four-year college or university. Because admission to law school is competitive and because records of applicants are individually evaluated, generalizations about minimum standards are difficult. However, successful applicants ordinarily have grade-point averages that place them in the upper one-half of their graduating class and Law School Admission Test (LSAT) scores that are above the national median.

The LSAT is also required of all applicants and is given by the Law School Admission Services throughout the United States in October, December, February, and June. The exact dates, places, and cost of the test, application blanks, and a bulletin of information about the test may be obtained by writing directly to Law School Admission Services, Box 2000, Newtown, Pennsylvania 18940, or to the College of Law, University of Idaho. Applicants cannot be assured of consideration unless they take the test no later than the December administration preceding the fall semester in which they desire admission.

Registration with the Law School Data Assembly Service (LSDAS) of the Law School Admission Services is required of all applicants. Instructions concerning registration and an application blank for this purpose are contained in the same bulletin that describes the LSAT (or may be secured separately from the College of Law or the Law School Admission Services).

Procedure for Admission. All applicants must: (1) secure from the College of Law a personnel form and an application form, complete and return them to the College of Law, together with a $20 application fee; (2) take the LSAT; and (3) register with the LSDAS and send to the College of Law an Application Matching Form.

Transcripts required by the instructions on the registration blank of the LSDAS should be forwarded to that service promptly.

A decision concerning admission will be made after receipt of the College of Law personnel and application forms, the application fee, the LSAT score from the Law School Admission Services, and the file, with a transcript analysis, from the LSDAS. Applications should be initiated no later than early December before the fall term in which the student intends to register, and all information necessary to the admission decision should be on file at the College of Law by February I of the year in which admission is desired.

Admission to Advanced Standing

Students who have previously studied law in a law school that is either a member of the Association of American Law Schools or is approved by the American Bar Association may be admitted only if they are in good standing and eligible to continue in the school in which previously registered and if, in the opinion of the Law School Committee on Admissions, academic performance at that institution warrants such action. Usually the committee requires substantially above a 2.50 grade-point average on all law courses undertaken. There must also be space available to accommodate the student. When space is available, priority is accorded transfer applicants who are residents of Idaho. If entrance by transfer is granted, the number of credits to be recognized from the previous institution is determined by the dean of the College of Law in each case. The last 26 semester credits of law must be completed in residence at the University of Idaho.

Nondegree Candidates

Students who are not degree candidates in the College of Law but are enrolled elsewhere in UI are permitted to register for a course offered by the College of Law if the permission of the dean of the College of Law and the instructor of the course are both granted. Such courses cannot be credited toward a law degree even if the student is later admitted to the College of Law. In addition, the law college offers a small number of courses especially designed for graduate students in non-law graduate programs at UI and WSU.

Combined Degree Programs

A very limited exception to the requirement of a degree before admission exists for highly capable students enrolled in a regular combined degree program who will experience exceptional hardship if not accepted after 98 hours of college work. Admission of these students is discretionary with the College of Law Admissions Committee and permission is rarely granted.

The conditions that must be met for a combined degree student to receive serious consideration are: (1) demonstration of outstanding ability by a cumulative pre-law average to the time of application of at least 3.50; (2) demonstration of excellent aptitude for law study by a score on the LSAT well above average; (3) submission of a certificate from an appropriate officer of the undergraduate institution attesting to the fact that the applicant will receive the bachelor's degree from his or her college or university after the successful completion of one year of law study; and (4) demonstration of some compelling reason for accelerating his or her law school admission, such as extreme personal or family hardship.

Fees

Students in the College of Law pay $188 per semester in addition to the fees paid by students in other divisions of the university. (See "Fees and Expenses" in part 2 of this catalog.)

Grading System

1. Grades for courses taken in the College of Law shall be awarded on the basis of A, A-, B+, B, B-, C+, C, C-, D+, D, D-, and F; provided, however, that by resolution the law faculty may designate any course, or courses, to be graded on the basis of P or F.

2. Grade-point averages of students in the College of Law shall be computed by assigning the following numerical point values per semester hours: A = 4.00; A- = 3.67; B+ = 3.33; B = 3.00; B- = 2.67; C+ = 2.33; C = 2.00; C- = 1.67; D+ = 1.33; D = 1.00; D- = 0.67; F (or "fail" under the pass-fail basis) = 0.00. The cumulative grade-point average is the quotient of total points assigned, divided by total hours undertaken, except that courses in which marks of I, W, or P (pass) have been given shall be disregarded in the computation. All other courses shall be included even if they have been repeated.

3. The grading system described above became effective in 1971. It applies in determining: (a) eligibility for continuing study in the College of Law; (b) compliance with requirements for the Juris Doctor degree; and (c) class ranking within the College of Law. It is also used on any grade reports issued by the College of Law. Plus or minus grades do not appear on transcripts issued by the registrar.

4. Grades in most courses offered by the College of Law are awarded on the basis of performance in a single written examination conducted at the end of the semester. In courses where it is so announced, grades on written projects or classroom participation may be included.

Additional Information

For more detailed information about the College of Law, including descriptions of the honor system, academic requirements, requirements for graduation, and curriculum, see the College of Law Announcement.

College of Letters and Science

Kurt O. Olsson, Dean (112 Admin. Bldg.); Doyle E. Anderegg, Associate Dean; Dene K. Thomas, Associate Dean.

Established in 1900, the College of Letters and Science (L & S) is the oldest division of the university. The objectives of the college are to provide a liberal and professional education in the arts and sciences, to advance knowledge through research and scholarship, and to perform service to the university at large, the state, and the nation.

Departments and Programs of Instruction

Included within L & S are the Departments of Biological Sciences, Chemistry, English, Foreign Languages and Literatures, History, Mathematics and Statistics, Philosophy, Physics, Political Science and Public Affairs Research, Psychology, Sociology/Anthropology, and Theatre Arts. The School of Communication and the Lionel Hampton School of Music also function as departments of the college. Cooperating departments from other divisions include the Departments of Art, Bacteriology and Biochemistry, Economics, Geography, and Naval Science, and the Margaret Ritchie School of Home Economics. The departments and schools in L & S offer nearly 100 curricula and curricular options leading to baccalaureate degrees, as well as graduate study leading to master's and doctor's degrees.

Undergraduate. See departmental sections in part 5.

Graduate. The College of Graduate Studies offers work toward advanced degrees in many disciplines of the College of L & S. Currently work leading to a master's degree is available in the fields of anthropology, biological sciences, botany, chemistry, English, French, German, history, mathematics, music, physics, political science, psychology, Spanish, statistics, theatre arts, and zoology. The degree of Doctor of Philosophy is available in botany, chemistry, history, mathematics, physics, political science, and zoology. For the specific degrees available, see the list of programs offered in part 1.

Nondegree. A nondegree program is offered in which each student's course of study is worked out to meet his or her special needs. The program is intended primarily for students who (1) do not plan to obtain degrees at the University of Idaho, (2) plan to transfer to other institutions, or (3) have objectives that are not provided for by any of the established curricula in the college.

Interdisciplinary Studies. Students who have broad educational goals that necessitate work in several disciplines or departments may present an interdisciplinary curriculum for the B.A. or B.S. degree. For details, see the program in interdisciplinary studies in part 5.

Preparatory Programs in Medicine and Dentistry. Premedical and predental programs are administered by the L & S Health Studies Committee.

Environmental Sciences. The university does not offer a separate degree program in environmental sciences; however, students who wish to prepare for careers in this field should consult the L & S dean's office about the possibility of developing an appropriate plan of studies under the program in interdisciplinary studies.

Admission to the College

Students who expect to enter L & S should plan their high school electives carefully, both to lay the foundation for their general education, which will be continued in the university, and to ensure that they are adequately prepared to begin their study at the college level. Students should select subjects in English, foreign language, social sciences, natural sciences, mathematics, and fine arts that will provide a well-rounded preparation for further study. For a statement of general admission requirements, see part 2. Graduates of four-year, accredited high schools ordinarily are eligible for admission to L & S.

Regular Enrollment in a Program of Studies

Students in L & S must enroll in regular programs unless they are attending on a part-time basis (seven-credit maximum), or they are admitted to nondegree programs. Except for the two-year program in prenursing studies, a regular program is one that leads to a degree that the college offers. However, it is not necessary to select a major curriculum until the beginning of the junior year. This permits the undecided student to take courses in a wide range of fields in order to choose a major more wisely.

Teacher Education Program

Students in L & S who are preparing for secondary-school teaching should consult the section on the College of Education in this part 4.

Laboratory of Anthropology

The Alfred W. Bowers Laboratory of Anthropology, established in 1968, serves as the research arm of the College of Letters and Science for investigations in archaeology, ethnohistory, linguistics, and physical anthropology. Major contractual research has been concentrated in historical and prehistoric archaeology for the National Park Service, Bureau of Reclamation, and the U.S. Army Corps of Engineers, burial relocation for several Northwest American Indian tribes, and archaeological surveys for the U.S. Forest Service and the Bureau of Land Management. The laboratory serves as the main clearinghouse and repository for all northern Idaho archaeological collections and records. Much of the day-to-day work consists of providing public service information on archaeological sites and artifacts for interested citizens as well as environmental impact statements for industry and government.

Modern and well equipped facilities for the cleaning, preservation, and analysis of both historic and prehistoric artifacts are contained in the laboratory. The metal artifact cleaning facilities are among the largest and best equipped in the country. The laboratory also provides space and facilities for research associates, graduate student research, teaching and comparative collections, and a regionally oriented library.

Osteological analysis of human skeletal populations is a major concentration of the laboratory. As a matter of policy, no American Indian skeletal collections are maintained. Before any such material passes through the laboratory for analysis before reburial, the project must have the approval of the tribal authorities concerned.

General Requirements for Graduation

Each student working toward a baccalaureate degree from the college must satisfactorily complete 128 semester credits (unless a higher number is specified in the particular curriculum), including at least 36 credits in courses numbered 300 and above, the all-university requirements (see regulation J-3 in part 3), and the college and departmental requirements for the degree sought. The college requirements applicable to the B.A. and B.S. degrees are listed below. The requirements for the various professional degrees (i.e., B.F.A., B.Mus., B.N.S., B. Appl.Phys., and B.Tech.) are listed by academic unit in part 5. The college B.A. and B.S. requirements do not apply to these professional degrees.

College Requirements for the B.A. and B.S. Degrees

Objectives. The college requirements for the B.A. and B.S. degrees are designed to ensure a broad, liberal education through the attainment of the following objectives: (1) proficiency in written and spoken English; (2) appreciation of great literature, music, and art; (3) knowledge of human development, the growth of social and economic institutions, and an understanding of the rights and responsibilities of the individual citizen; (4) perspective of American culture in the world at large; (5) sense of historical perspective; (6) acquaintance with moral, ethical, and aesthetic values; (7) familiarity with scientific thought and method; (8) ability to use and interpret basic mathematical concepts; (9) understanding of ecology; and (10) a continuing attitude of intellectual curiosity.

Requirements for the B.A. Degree

Humanities—6 credits (two courses) in addition to the minimum university-wide core requirements.

Social Sciences—3 credits (one course) in addition to the minimum university-wide core requirements.

Foreign Language—0-16 credits (zero-four courses), i.e., competence in one foreign language equivalent to that gained by the completion of four semesters of college courses (through the intermediate level). This requirement may be satisfied by the completion of either of the following options: (1) 16 credits or four high-school units in one foreign language, or (2) 12 credits in one foreign language, and one three-credit course in literature translated from the same language. The 12 credits may be satisfied by three high-school units in one foreign language.

Requirements for the B.S. Degree.

Humanities—3 credits (one course) in addition to the minimum university-wide core requirements.

Social Sciences—3 credits (one course) in addition to the minimum university-wide core requirements.

Natural Sciences, Mathematics, and Statistics—6 credits (two courses) in addition to the minimum university-wide core requirements.

For the B.S. degree, the student may substitute the successful completion of an academic minor or area of emphasis of at least 18 credits approved by the department in which the student is majoring.

Courses satisfying the *humanities* requirement are those dealing with the arts, literature, and philosophy. Courses satisfying the *social sciences* requirement are those dealing with a person's

social condition including social relations, institutions, history, and participation in an organized community. *Mathematics and statistics* requirements can be met by taking courses in the Department of Mathematics and Statistics. Likewise, the *natural science* requirements can be met by taking courses in the life sciences and the physical sciences.

Special topic, workshop, seminar, and directed study courses are generally not applicable. However, individual departments can, at their discretion, certify one of these nonregular courses as meeting Letters and Science B.A. or B.S. requirements in an appropriate category.

Progress in Satisfying These Requirements. Students who wish to graduate by the end of four years of college work should take a program that results in substantial progress toward the fulfillment of the preceding requirements by the end of the sophomore year. In particular, students seeking the B.A. degree should take courses in fulfillment of the foreign-language requirement as early as possible. If they cannot do this during the first semester, they should immediately take a course that can be used in partial fulfillment of the science-mathematics requirement.

Major Curricula

Selection of a Major. Each student should select a major curriculum no later than the beginning of the junior year. Lower-division students who have not decided on a major may remain in a "general" classification, which permits them to explore a variety of possible major fields of study.

Major Requirements. The departmental requirements are stated under the respective curricula in part 5.

College of Mines and Earth Resources

Robert W. Bartlett, Dean (206 Mines Bldg.); Robert Hautala, Associate Dean.

The College of Mines and Earth Resources (then called "School of Mines") was established in 1917 as an administrative unit of the university. There are three academic departments in the college, the Departments of Geography, of Geology and Geological Engineering, and of Metallurgical and Mining Engineering, and four other administrative divisions, the Glaciological and Arctic Sciences Institute, the Bureau of Mining Research, the Cart-O-Graphics Laboratory, and the Idaho Mining and Mineral Resources Research Institute. The Idaho Geological Survey, the director of which also serves as the dean of the college, is an affiliate program.

The college is concerned with all aspects of earth science and technology, and the course and curricular offerings have expanded considerably since the college was founded. Following is a list of the academic degrees that have been conferred in the various disciplines; the date following each is the year in which this degree was first conferred. Cartography (B.S. 1980); mining engineering (B.S. 1918, M.S. 1918, Ph.D. 1972); metallurgy, until 1934 (B.S. 1922, M.S. 1920); metallurgical engineering (B.S. 1935, M.S. 1936, Ph.D. 1973); geology (B.S. 1912, M.S. 1922, Ph.D. 1964); geological engineering (B.S. 1935, M.S. 1940); geography (B.S. 1958, M.S. 1968); hydrology (M.S. 1970). The Ph.D. in geography became available in 1989.

In addition to the advanced degrees listed above, the College of Graduate Studies offers work leading to these degrees: Master of Arts in Teaching with majors in geography and earth science and Master of Natural Science with a major in earth science.

Equipment and Facilities

Mining Engineering. Facilities and equipment include a rock mechanics and geophysical laboratory equipped with polariscope, strain recorder, electrical resistivity and magnetic units, a universal testing machine, a shear test machine, and other instruments for stress-strain studies of rock structure. Mine surveying instruments, ventilation apparatus, and other mining engineering tools are available. Illustrative material includes maps, drawings, films, slide collections, and video tapes that show mining methods and practices. There is video taping equipment for recording at mine sites and playback in the lab. The greatest assets for laboratory or graduate studies in mining engineering, however, are the deep mines in the Coeur d'Alene district, the small operations around the state, and the open pit mines of southern Idaho. Mining students who are interested in practical investigations or basic research can usually arrange to gather necessary data at the best source—an operating mine.

Metallurgical Engineering. The extractive metallurgy laboratories are equipped for class instruction and research in ore dressing and process metallurgy. Equipment includes crushers, ball mills, pulverizers, screens and screen shakers, flotation machines, leaching equipment, and various other concentrating machines including a Carpco induced-roll magnetic separator and a high-intensity electrostatic separator. Equipment is available for modern instrumental analysis as well as wet chemical and fire assaying. Computer facilities allow training in data logging, on-line optimization, and process control techniques.

Physical metallurgy includes scanning electron microscopy with EDAX, the metallography laboratory with facilities for polishing and etching metals, alloys, minerals, and ceramic materials for macroscopic and microscopic examination, a variety of microscopes for visual examination of specimens, a metallograph, cameras, a darkroom for photographic work, and a corrosion studies laboratory. The x-ray diffraction laboratory is equipped to handle a large variety of problems in metallurgy, ceramics, and mineralogy, such as identification of alloy phases and minerals, texture studies, and phase diagram determinations. Other equipment includes melting furnaces, forging hammer, and rolling mill for specimen preparation, heat treating and thermal analysis furnaces, physical and mechanical test instruments, and ceramics fabrication equipment.

Geology and Geological Engineering. Laboratories are maintained for work in all of the basic courses, with large study collections of fossils, rocks, minerals, crystal models, ore suites, thin sections, polished sections, and topographic and geologic maps.

Equipment used in advanced courses include rock sawing and polishing facilities, binocular microscopes, reflection and polarizing microscopes, photomicrographic apparatus, x-ray diffraction and flourescent equipment, and an atomic absorption spectrophotometer. The electron microprobe of the Idaho Geological Survey is available to advanced students. Also available are computers, proton magnetometers, resistivity survey equipment, an 12-channel seismograph, a gravity meter, an EDM survey unit, soil drilling and sample kits, water-level recorders, and other geophysical and hydrological equipment. Geological engineering also shares strain testing and other apparatus with mining engineering in the Geological Engineering/Mining Engineering Rock Mechanics Laboratory.

Research laboratories are equipped for work in applied geochemistry, economic geology, paleontology, photogeologic analysis, remote sensing, engineering geology, and soil testing. Facilities for research in hydrology are also available in other divisions of the university.

Through the Glaciological and Arctic Sciences Institute, cooperative facilities for field training and research in British Columbia and Alaska are available in the disciplines of mining and exploration geology, geophysics, terrestrial photogrammetry, field surveys and mappings, geomorphology, and glaciology.

Geography. The department's main laboratories are the surrounding regions, in sequence of increasing size: The Palouse, The Inland Empire, and The Pacific Northwest. There are now about 124,000 maps, numerous atlases, and 40,000 aerial photographs of Idaho in the University Library's collection. The library is a regional depository for federal documents including products of the

Defense Mapping Agency. The department maintains a modern cartographic laboratory with a process camera and darkroom, a plate maker, word processor-drive phototypesetter, and numerous pieces of supplemental equipment. A digitizer-graphics calculator and two ISC-8052 color graphic computers are department hardware, while digital plotting and mainframe computing are provided through the University's Computer Services facilities.

Cart-O-Graphics, the Department of Geography's graphics laboratory, offers design, drafting, and reproduction services for maps and other graphics to illustrate research reports and other publications while providing work experience for students. Although this laboratory primarily serves the university's needs, it also serves other agencies in the state and region.

Scholarship and Loan Funds

Students having a high academic standing in high school or college should refer to the "Financial Aid" section in part 2 of this catalog. The Hecla-Bunker Hill Scholarships are available to students in the college, but not exclusively to them. The following are exclusively for students in the College of Mines and Earth Resources: Mineral Industries Education Foundation—five scholarships that pay $500 each year for four years (open only to entering freshmen in mining engineering or metallurgical engineering); ASARCO Foundation—one $750 scholarship (open to a currently enrolled sophomore or junior); Idaho Mining Memorial Scholarship (open to entering students); A. E. Larson Scholarship (open to currently enrolled students); W. W. Staley Scholarship (open to currently enrolled students in mining engineering); out-of-state tuition waivers (open to new students who are not residents of Idaho); Albert Hall Featherstone Scholarships and the Carl Savage Memorial Award (open to currently enrolled graduate students). Also available are other scholarships in the name of Harold and Claudia Stearns for geology students and the Norman Smith and J. Magnuson scholarships for undergraduate COMER students. The Laney and J. J. Day loan funds are also available to students enrolled in the college. Several scholarships are also available for support of summer students in the geology field camp and the Glaciological and Arctic Sciences Institute. For further information, write to the scholarship chair, College of Mines and Earth Resources, and to the Office of Student Financial Aid, University of Idaho.

Out-of-state tuition waivers are available on a limited basis and Oregon residents can enter mining, metallurgical, and geological engineering paying resident fees.

Idaho Geological Survey

Robert W. Bartlett, Director (206 Mines Bldg.); Earl M. Bennett, Associate Director and State Geologist (228 Morrill Hall).

The Idaho Geological Survey, by its statutory mission, is the state of Idaho's lead agency for the collection, interpretation, and dissemination of all scientific information on the geologic and mineral resources of the state. Administratively it operates in special program status at the University of Idaho with its director also serving as dean of the College of Mines and Earth Resources. As such it performs applied field and laboratory research and serves the university, the mineral and other industries, and the general public by publishing the results of its many programs and by answering correspondence and offering consultation. Analytical work with sophisticated instrumentation is a major part of all services offered.

Cooperative work between the survey and the educational programs of the College of Mines and Earth Resources and with other state and federal agencies, particularly the U.S. Survey of Mines and the U.S. Geological Survey, enhances the overall work of the college and the survey. The staff and that of the College of Mines and Earth Resources share equipment, as well as the specialized expertise of both groups. Survey personnel, who are experienced in both applied and academic areas, are available to any department of the university for advice, consultation, and occasional lecturing. Whenever possible, students in the College of Mines and Earth Resources are offered part-time or summer work as assistants to survey professionals, frequently on projects that are funded by grant monies available for some programs. High quality graduate student dissertations, when in accord with the survey's mission and with proper permission, are often published in one of the several survey formats.

Although equipment used by the survey is housed both in the Mines Building and Morrill Hall, the principal business office of the survey and most survey personnel are located in Morrill Hall. Here, also, the survey maintains a publication sales service, including the sale of topographic maps published by the U.S. Geological Survey; this is a service used extensively by the academic community and the general public. The University Library is a repository for the many valuable American and worldwide publications received through the bureau's publication exchange program.

The survey has been housed at the university since it was originally established in 1919 under the name Idaho Bureau of Mines and Geology. Its names was changed to the Idaho Geological Survey by an act of the legislature in 1984.

Idaho Mining and Minerals Resources Research Institute

Robert W. Bartlett, Director (206 Mines Bldg.)

The institute was established in August 1977 under title III of Public Law 95-87, which provides for an annual appropriation by the secretary of the interior via the U.S. Office of Surface Mining to assist the various states in maintaining minerals resource research centers. These centers are usually located at land-grant institutions that have schools of mines.

As a division under the university, the Idaho Mining and Minerals Resources Research Institute (IMMRRI) has its headquarters in the office of the dean of the College of Mines and Earth Resources. The institute has a teaching, research, and service mission aimed at the solution of a variety of mineral-related problems affecting the state and the nation today and in the future. Its aim is to work cooperatively with the Rocky Mountain Minerals Consortium and with federal, state, and other agencies particularly in Idaho, Oregon, and Washington.

The work of IMMRRI often involves problems that are too complex to be solved by one person; a team approach is taken that combines the knowledge and skills of specialists from several disciplines including metallurgy, mining engineering, geology, geophysics, hydrology, and minerals geography, and involves consulting scientists and engineers from other disciplines. The scientific data and information derived by the institute will lead to the recovery and use of diverse and valuable mineral resources of the state of Idaho and the nation.

Glaciological and Arctic Sciences Institute

Maynard M. Miller, Director (206 Cont. Ed. Bldg. and Geology Dept., Mines Bldg.).

The institute was established at the university in 1975 by the Board of Regents to promote field involvement learning and research participation of undergraduate and graduate students. Both formal and directed study field courses are given on the Juneau Icefield on the Alaska-B.C.-Yukon border, operating out of a series of field stations provided by the Foundation for Glacier and Environmental Research at the Pacific Science Center, Seattle, Washington. The academic program is cooperative with the University of Alaska-Southeast. The National Science Foundation and other agencies have provided substantial participantship support in recent years. The field training is interdisciplinary in nature and involves field and exploration geology, exploration geophysics, glaciology, Pleistocene stratigraphy, glacial and periglacial geomorphology, arctic geobotany, remote sensing, and allied areas of the atmospheric sciences and survey and mapping. The summer session runs for eight consecutive weeks during July and August.

Opportunities for graduate thesis work are available with a faculty/student ratio of one to one.

Teacher Education Program

Students in the College of Mines and Earth Resources who are preparing for secondary-school teaching should consult the College of Education section in this part 4.

General Requirements and Undergraduate Curricula

University Requirements. See regulation J in part 3 for the all-university requirements for graduation.

Electives. A list of acceptable electives may be consulted in the office of each head of department and adviser in the college. Electives must be approved by the head of department or the adviser involved.

Major Curricula. As specified in part 5, the programs of study in this college require from 128 to 136 credits. The curricula include the departmental and general requirements as set forth above.

University Honors Program

Marvin Henberg, Director (102 Psych. Bldg.).

The University Honors Program is open to students from all undergraduate colleges and majors. The great majority of students will be able to participate in the program without adding to the total number of credits needed for graduation.

The program director and associate director act as supplemental academic advisers to all students qualifying for honors study. Honors students can anticipate a more challenging general educational experience than would otherwise be available to them. Most honors classes are small, and honors students thus profit from close intellectual contact with their instructors and fellow students. Honors students are expected to write more, think more, and discuss more than their counterparts in non-honors courses. An attractive Honors Center facility is available for use on both a formal and informal basis.

Eligibility

On the basis of their high school record and standardized test scores (ACT or SAT), qualified incoming freshmen are invited to participate in the program. Admission is competitive. Students receiving a 27 ACT composite score, OR a 1200 SAT combined verbal and math score, OR a 3.7 high school GPA are invited to join. Students who do not meet one of these criteria can write the honors director explaining their interest in the program and their reasons for wanting admission. They must have two former teachers send letters of recommendation to the director. Students who demonstrate superior performance during their first semester at the UI may also apply for admission at the end of that semester. Transfer students are considered for admission on a case-by-case basis; students in good standing in an honors program at their previous school are automatically admitted. Their transcripts will be evaluated and appropriate credit given toward the honors certificate.

General Requirements

All honors students work toward a minimum of 30 credits in honors courses. They must further satisfy distribution requirements among specific subject areas. Full information on distribution requirements is available from the Honors Program Office.

Honors Certificate

The honors certificate is awarded to all students who (1) complete the prescribed 30 credits in honors courses, (2) satisfy all other university and departmental requirements for graduation, and (3) achieve a minimum 3.0 GPA for all honors credits taken. Only students participating in the University Honors Program qualify for the honors certificate, and only credits taken in the program count toward the certificate. Students in the program will have all honors credits indicated as such on their permanent transcripts, even if they do not complete the full 30 credits required to earn a certificate.

Academic Major

Students participating in the University Honors Program must satisfy all requirements for their respective majors. Because a prime emphasis of the program is to provide intensive and broad exposure to a variety of academic fields, students will find that over half the honors courses will satisfy the various categories in UI's general education core requirements. The other credits required for the certificate sometimes satisfy requirements for departmental majors, and all credits count toward the total required for graduation.

Suggestion to Prospective Students

Most prospective honors students are contacted during the senior year in high school and invited to join the program. Nevertheless, it is possible that highly qualified students, especially those who apply to the university during the summer or just before registration, will be overlooked. Any student who is interested in honors study and who thinks he or she would qualify for admission is urged to write the director or drop by the program office.

Cooperative Programs

The university participates in a number of cooperative arrangements in the state and region to extend resources and take advantage of special facilities.

Washington State University

Located only eight miles apart, the University of Idaho and Washington State University, in order to take advantage of unique strengths of each institution, have for some time operated a cooperative graduate and undergraduate course program. Courses available on either campus are identified in departmental listings, and offerings are listed in the Time Schedule. In addition, the two schools cooperate in programs in medicine, veterinary medicine, and food science and technology.

Medical Education (WAMI Program)

Michael B. Laskowski, Director, Idaho WAMI Medical Education Program (302 Student Health Serv. Bldg.).

In the WAMI Medical Education Program, offered by the University of Washington School of Medicine (UWSM) and selected universities and communities in Washington, Alaska, Montana, and Idaho (WAMI), medical students from Idaho (special residency requirements apply) receive the first year of their medical training at the University of Idaho. Students attend classes at the University of Idaho and Washington State University, thus benefiting from a large group of instructors and varied selection of elective courses; laboratories and other facilities for individual work are available at both institutions. First-year students also have the opportunity to work with local physician-preceptors. After completing the second year of the basic curriculum at the UWSM, the student continues in a program of clinical pathway electives during the third and fourth years that may be taken entirely at the UWSM or that may include participation in any of 23 UWSM WAMI community clinics in the

four participating states. Six-week clerkships in these community clinics under the auspices of the UWSM, supervised by local physicians at the office and in the hospital, offer the student a realistic approach to the problems of medical practice.

Veterinary Medical Education (WOI)

The University of Idaho cooperates with Washington State University and Oregon State University in a program of veterinary medical education, research, and service. In the WOI program, students from Idaho take the first three years of professional training in veterinary medicine at Washington State University. In the fourth year of the program, students receive part of their clinical training at a veterinary medical facility at Caldwell, Idaho, where they can specialize in preventive food-animal medicine. Cooperative graduate programs leading to M.S. and Ph.D. degrees are also available. Idaho students seeking to enter the professional program must complete a Washington State University Uniform Undergraduate Application Form as well as a WOI Program application. Both may be obtained from and returned to the Office of Student Services, College of Veterinary Medicine, Washington State University, Pullman, Washington 99164. In addition, Idaho applicants must secure certification of Idaho residency status by completing and submitting the appropriate residency certification forms available through the University of Idaho Admissions Office.

Idaho Falls Center for Higher Education

In cooperation with other universities in the state and region, with the U.S. Department of Energy, and with others, the University of Idaho administers graduate and undergraduate programs at the University of Idaho/Idaho Falls Center for Higher Education. For more information, see "Special Programs" further on in this part 4 of the catalog.

AWU Program

The university is a member of Associated Western Universities, which is a cooperative venture of certain institutions to make use of national laboratories located in the west. Financial support is available from the U.S. Department of Energy for graduate students and faculty to spend periods of time, up to one year, pursuing research projects at a number of these laboratories.

Interuniversity Program in Public Administration

Florence A. Heffron, Department of Political Science and Public Affairs Research (201A Admin. Bldg.).

The University of Idaho, with Idaho State University and Boise State University, offers a cooperative graduate program leading to the M.P.A. degree to provide present and prospective public administrators with a professional education and to prepare them to understand and adjust to a changing and challenging environment. Courses in core areas and in optional areas of emphasis, such as general public administration, natural resources administration, public works administration, and public finance, management, and budgeting, may be taken at any of the participating institutions without restriction. For further information, consult the Department of Political Science and Public Affairs Research.

College of Graduate Studies

Jean'ne M. Shreeve, Dean (112 Morrill Hall); Roger P. Wallins, Associate Dean.

The College of Graduate Studies was formally organized in 1925 (then designated as the Graduate School), but the university has offered advanced degrees for more than 90 years, awarding the first master's degree in 1897. The Graduate College encompasses all divisions of the university, but does not supervise programs in the College of Law. This coverage of all regular disciplines and professional fields provides a wide variety of academic programs. Enrollments are large enough to make possible the vital interchange of ideas among students and between students and faculty that is necessary for graduate programs, and yet enrollments are sufficiently small to permit close faculty-student relationships. Interdepartmental cooperation is an important factor on the Idaho campus. The university is the chief research center for the state and as such operates active graduate programs in most areas providing a broad research base upon which graduate programs have been built.

Degree programs are offered in 69 areas for master's degrees, 6 for professional degrees, and 22 for doctoral degrees. Specific degree offerings are listed in the *Graduate Bulletin,* which also provides detailed information about the Graduate College, appointments, financial aid, library, research facilities, and procedures.

Undergraduate Enrollment in Graduate Studies (Partial Enrollment)

A senior who must complete no more than 12 credits to earn a baccalaureate degree and who has a cumulative grade-point average of 2.80 or higher may apply for partial enrollment in the Graduate College. Seniors desiring partial enrollment must submit to the Graduate College a "Partial Enrollment Application" form that contains a registration plan designating undergraduate and graduate courses, thereby allowing a separate graduate transcript to be established. Capable students who are in their last year and who receive departmental approval for such enrollment can thus begin limited graduate work at an earlier date than would otherwise be possible. Partial enrollment is for one semester at a time only and does not admit or guarantee subsequent admission of such students to the Graduate College. Students who have been granted partial enrollment and who later wish to be admitted to the Graduate College for work on a degree must apply for admission to the Graduate College following usual procedures. The deadline to apply for partial enrollment is the last day of registration for that semester or session.

Senior in 500-Level Course

A senior may enroll in one 500-level course a semester provided that the student has (1) a cumulative grade-point average of 2.80 or higher; (2) obtained the written approval of the instructor of the course, his or her adviser, and the dean of the Graduate College; and (3) filed a "Senior in 500-Level Course" form with the Graduate office. Failure to file the form with all requisite approvals, including that of the graduate dean, will constitute a registration error, and no such registration is complete until the form has been accepted by the Graduate College. Credits earned under this regulation are recorded on the student's undergraduate record only and may not be used subsequently toward an advanced degree. The deadline for a senior to apply for enrollment in a 500-level course is the same as the deadline to register for that semester or session.

Continuing Education

Continuing education programs at UI are divided into several classifications, each separately administered: credit courses, correspondence study, video outreach, noncredit classes, and workshops, shortcourses, and conferences. Each college is responsible for the development of continuing education programs based on the needs that are identified.

Credit Courses. These courses offer University of Idaho credit and are available throughout the state within the limitations indicated above. Usually a minimum of 13 students is required to offer a course, and more may be needed if instructor travel is required. In northern Idaho, courses are more commonly taught by members of the resident faculty commuting from the Moscow campus. In locations distant from the home campus, local instructors who are fully

qualified may be employed subject to approval of the respective college in which the course is offered.

Generally, no single catalog of continuing education courses is available before the beginning of a semester. Instead, it is simply noted that nearly any course in the university catalog may be offered provided that an adequate number of students, a qualified instructor, and appropriate facilities are available. The schedule of courses in any geographic area is developed near the beginning of each semester and summer session. Each college is responsible for identifying and developing the courses needed, registration of students, and the administration of these programs. Individuals interested in taking courses for credit should directly contact the respective college to determine the courses available in their geographic area.

Admission procedures for enrolling in continuing education courses are streamlined. Generally, it is possible to register for a course at the time of the initial class session. In some cases to guarantee in advance the offering of a course, advance registration may be requested. Standards for admission to these courses are usually the same as for admission to credit courses on campus. Students in residence must have approval of their college before enrolling in additional credit courses.

Correspondence Study. Many UI courses are also offered through correspondence study. Each course parallels its campus counterpart in content and credits and may be started at any time, with one year allowed for completion. Most institutions limit the amount of correspondence study applicable toward a degree. For UI limitations, see regulation J-5 in part 3. A student currently enrolled at an institution of higher learning should receive permission from his or her dean before registering for a correspondence study course. Correspondence grades are not computed in the student's grade-point average at UI.

For a bulletin that contains further information on procedures, enrollment forms, and a complete listing of college, high school, and noncredit courses, write or call the Correspondence Study Office (telephone 885-6641).

Video Outreach Program. The Video Outreach Program delivers course work by videotape leading to master's degrees in civil engineering, computer engineering, computer science, electrical engineering, geological engineering, interdisciplinary studies, mechanical engineering, and psychology with an emphasis in human factors. Many other courses in business, chemistry, engineering science, mathematics, physics, and statistics are also available as well as a few noncredit shortcourses.

Lectures for regular on-campus classes are videotaped in special studio classrooms. Copies of these videotapes, together with the handouts provided by the instructors, are shipped to students once a week to their homes or workplaces. These courses are also available at reduced fees at the University of Idaho Centers in Coeur d'Alene, Boise, and Idaho Falls.

For further information, contact Engineering Outreach, University of Idaho, Moscow, Idaho 83843; (208) 885-6373.

Noncredit. The Conferences and Enrichment Program office (CEP) develops and administers the noncredit courses for the UI campus, Moscow, and the surrounding communities. During the fall, spring, and summer terms, over 100 classes are offered per semester to the community with total enrollments each year of approximately 6,000 participants, including children, youth, and adults. The program consists of classes in the arts, dance and music, recreation and hobbies, languages, health and fitness, foods and cooking, and computers and career development. Programs are developed with consideration given to the needs and desires of the general public, as well as to the economic times. Each class and instructor is independent in content, teaching style, duration, and fees; however, all have the common bond of extending the opportunities and resources of UI to the surrounding area. These evening and weekend classes are scheduled to complement the working person's schedule.

Conferences, Workshops, and Shortcourses. These offerings usually originate in the academic departments. University personnel develop the substantive parts of the workshop on a higher education level, and CEP arranges all logistics and handles all details throughout the course. The length of the programs, the format of the conference or seminar/workshop, and the fees charged the participants vary greatly and are determined by the departments or groups sponsoring the event. Some workshops continue for three weeks while other professional conferences convene for one day only. Continuing education units (CEU's) may be available for conferences, workshops, and shortcourses. For information about CEU's, contact the department or college sponsoring the activity.

CEP is able to assist UI faculty with workshops or professional conferences by (1) making all logistical arrangements and reservations, (2) handling the bills and incoming fees, (3) preparing materials for participants, (4) registering participants at the opening of the event, and (5) presenting a complete financial statement to the department or sponsor.

Any surplus money after the bills are paid is returned to the department and/or the sponsor of the event. If the program is unable to cover the costs, the department and/or sponsor is expected to reimburse CEP.

For further information, write or call Conference Services, University of Idaho, Moscow, Idaho 83843 (208/885-6486).

Elderhostel. Each summer UI offers one Elderhostel week in Moscow, one week in the forestry facility at Clark Fork, Idaho, and another week in the forestry facility at McCall, Idaho, where Elderhostelers combine educational classes and recreation. Inspired by youth hostels and folk schools of Europe and guided by the needs of older citizens for intellectual stimulation and physical adventure, Elderhostel is for elder citizens on the move—not just in terms of travel, but in the sense of reaching out to new experiences. Elderhostel is based on the belief that retirement does not have to mean withdrawal, but rather that one's later years are an opportunity to enjoy new experiences.

Elderhostel programs are available at 1,000 colleges, universities, independent schools, and other educational institutions in the U.S. and abroad. Those 60 and over are eligible for this program, which costs approximately $255 per week for classes, room, board, field trips, and entertainment.

For a catalog of schools and classes, write: Elderhostel, 80 Boylston Street, Suite 400, Boston, MA 02116. For more information about UI Elderhostel, call the Conference Services office (208/885-6486).

Resident Instructional Centers

Boise Center for Higher Education

Roger L. Reynoldson, Director, UI/Boise Center for Higher Education (800 Park Blvd., Boise, Idaho 83712).

The University of Idaho/Boise Center was established to serve certification and graduate program needs for persons involved in elementary, secondary, and higher education within Boise and the adjacent areas. Certification programs are available in vocational teacher and adult education, educational administration, and special education administration. A baccalaureate degree may also be earned in vocational teacher education.

Graduate programs in education include the master's and doctorate with an emphasis on vocational teacher education, educational administration, and adult education. Sixth year professional programs may be completed in educational administration, special education, and vocational teacher education.

The Boise Center serves as an outreach site for the Video Outreach engineering program. Persons interested in master's level engineering courses may enroll in the Video Outreach program.

College of Agriculture communication specialists, an agricultural education supervisor, and a professional staff development program for school administrators, Project LEAD, are also housed in the Boise Center.

Coeur d'Alene Center for Higher Education

Jack Dawson, Director, UI/Coeur d'Alene Center for Higher Education (800 W. Garden Ave., Coeur d'Alene, Idaho 83814).

The University of Idaho/Coeur d'Alene Center started in 1963 with one course from the College of Education. The number of courses and programs offered through the center continued to expand, and in 1980 a full-time director was appointed and a new location developed.

Today this center is located on the campus of North Idaho College, 85 miles north of Moscow. The shores of beautiful Lake Coeur d'Alene are a mere three-minute walk away. North Idaho College students receive advice on transferring to UI, as do many Coeur d'Alene area residents who take advantage of pursuing a degree while still at home. Recently the Coeur d'Alene Center, in an effort to provide services to the more northern reaches of the state, has been offering teacher certification classes in Sandpoint, Idaho. Also available to North Idaho students are graduate degree programs in education, educational administration, counseling and human services, vocational teacher and adult education, physical education, and sport and recreation management. An undergraduate elementary education program is being offered in conjunction with North Idaho College, as are teacher certification programs in both elementary and secondary areas.

The Coeur d'Alene Center is also an off-campus location for the Video Outreach Program.

The center offers over 100 courses and enrolls approximately 1,800 students each academic year including an eight-week summer session.

Idaho Falls Center for Higher Education

Fred H. Tingey, Director, UI/Idaho Falls Center for Higher Education (P.O. Box 778, Idaho Falls, Idaho 83402).

The University of Idaho/Idaho Falls Center for Higher Education, which began evolving in the early 1950s in support of the atomic energy operation at the Idaho National Engineering Laboratory, has developed into a general education center administered by the University of Idaho. Supported in part by funds provided by the U.S. Department of Energy, the center provides undergraduate and graduate education to INEL professionals and to the general public in the Idaho Falls area. The program is administered by a resident director who reports to the vice president for academic affairs and research. Through the center students holding undergraduate degrees may earn UI master's degrees in interdisciplinary studies, mathematics, metallurgy, and engineering. Also through the center, Ph.D. degrees in electrical, mechanical, civil, chemical, nuclear, and metallurgical engineering, physics, and chemistry may be obtained.

In addition to the graduate degrees, students may earn bachelor's degrees in technology, computer sciences, applied math, and general studies. Certificates of General Proficiency are also offered in many different areas. These certificates recognize the successful completion of approximately 30 semester credits in a particular discipline. The center offers approximately 85 courses and enrolls approximately 750 students each semester.

UI Engineering in Boise

Robert E. Rinker, Director, UI Engineering in Boise, (1910 University Drive, TB 201, Boise, Idaho 83725)

In cooperation with Boise State University and Boise area industries, the University of Idaho College of Engineering maintains resident instruction programs leading to B.S. degrees in electrical engineering and computer engineering in Boise. Courses are also available in mechanical and civil engineering. Housed in the recently completed Technology Building on the BSU campus, the program allows students to blend pre-engineering courses from BSU with upper-division engineering courses taught by UI faculty members to earn UI engineering degrees.

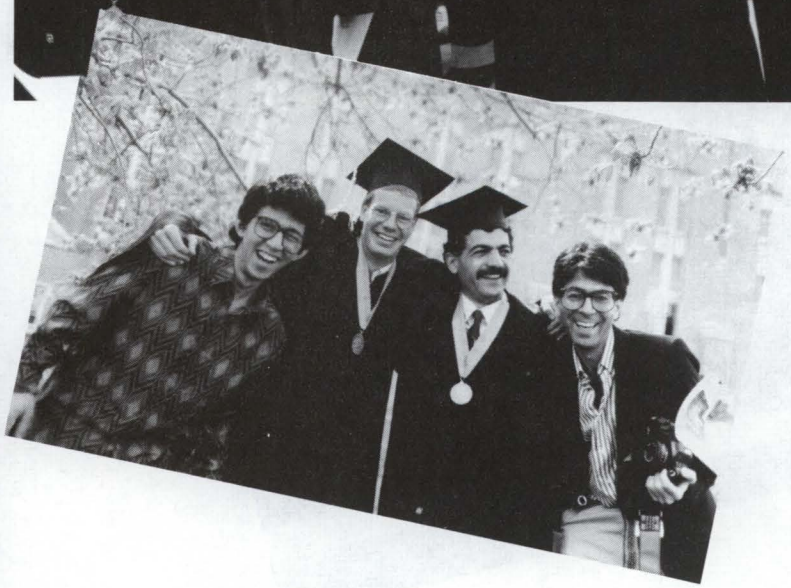
Summer Session

Sid Eder, Director of Summer Session (507 Education Bldg.).

A fourteen-week summer session begins about the third week in May. The flexible summer schedule includes a three-week early session. two four-week terms, two six-week terms, an eight-week term, and a three-week post-session. During any of the terms, many courses are accelerated into one-, two-, or three-week concentrated sessions. Many recreational and cultural activities are scheduled through the Campus Recreation Office and the Outdoor Programs Office, as well as programs presented through the Hampton School of Music and the Department of Theatre Arts. Special pre-college programs for elementary, junior, and senior high school students are also available in several departments.

Academic regulations included in this catalog are applicable during the summer session. Anyone interested in enrolling is invited to write the Summer Session Office for a copy of the summer bulletin that is published each year in March. The bulletin contains complete information needed to register for the summer session. For more information, call (208) 885-6237.


IDAHO



Course Numbering System and Key to Abbreviations and Symbols

Departments and programs in this section are listed in alphabetical order. Courses are listed by subject field with the departments and programs in which they are offered. For example, under the Division of Vocational Teacher and Adult Education, the following groups appear: business education, industrial education, and vocational teacher education.

Numbering System

Courses numbered 010-099 are remedial-level courses carrying no credit; those numbered 100-299 are lower-division courses primarily for undergraduates; 300-499 are upper-division courses primarily for advanced undergraduates, fifth-year students, and graduates; courses numbered 500-600 are intended for and are restricted to students enrolled in the College of Graduate Studies (see regulation B-8 in part 3 for the exception to this rule); courses numbered 800-999 are intended for and are restricted to students enrolled in the College of Law.

Letter Designations with Numbers

Certain course numbers also include letters preceding the arabic number — R101, C100, etc.:

C; (C) — when included as part of the course number, offered by correspondence study only; when shown in parentheses following the number of credits, also offered by correspondence study.

H — offered only in University Honors Program.

ID — cooperative course with Washington State University offered at the University of Idaho and available to WSU students.

J — courses conducted jointly, e.g., MusA J365/J565 (Chamber Ensemble), in which students' assignments and expected levels of performance reflect the levels for which they are enrolled.

R — offered only at the UI/Idaho Falls Center for Higher Education.

WS — cooperative course with Washington State University offered at WSU and available to University of Idaho students. For complete description, consult the WSU catalog.

Subtitled Courses

An "s" in parentheses between the number and title of a course indicates that the course may be offered under the main title and/or with an appended subtitle, e.g., "Seminar" and/or "Seminar in the History of the Pacific Northwest." The specific area normally will be listed in the Time Schedule as a separate section of the main course.

Credit Designations

Immediately following each course title, the number of credits authorized is shown in parentheses. Typical designations are:

(3 cr) — three semester credits (for courses with more than one number, e.g., 101-102-103, the three credits apply to each number).

(1-3 cr) — one to three semester credits.

(3 cr; 2 cr) — three credits fall semester; two credits spring semester.

(1-3 cr, max 3) — one to three credits during any academic session and the course may be repeated until the maximum of three credits has been earned.

(3 cr, max 12) — three credits during any academic session and the course may be repeated until the maximum of twelve credits has been earned (for a course with more than one number, e.g., 301-302, the maximum is overall and applies to the combined numbers).

(cr arr) — credits to be arranged (may be repeated for credit without restriction as to maximum).

(1-3 cr, max arr) — one to three credits during any academic session, and the course may be repeated.

Parenthetical Course Numbers

Course numbers that appear in parentheses after the course credits are former numbers and appear for one edition only.

Other Abbreviations

alt/yrs — offered in alternate years
coreq — corequisite
cr — credit
dem — demonstration
dept — department
disc — discussion
div — division
exam — examination
GPA — grade—point average
grad — graduate
hr — hour
intro — introduction(-tory)
jr — junior
lab(s) — laboratory(-ies)
lec — lecture(-s)
perm — permission of instructor
perm of dept — permission of department or subject—field chair
P/F — (graded) on the basis of pass or fail
prereq — prerequisite
reqd — required
soph — sophomore
sr — senior
undergrad — undergraduate

Department of Accounting

Jeffrey L. Harkins, Dept. Head (209-G Admin. Bldg.). Faculty: Teresa P. Gordon, Jeffrey L. Harkins, Melvin G. Jolly, Michael R. Ruble, Vickie H. Ruble, Glen G. Utzman, Jerry L. Wegman.

The objective of the accounting program is to prepare students to achieve their full potential in their professional careers. The program is designed to develop and enhance a student's critical thinking, judgment, and communication skills. Students are provided the opportunity to study in a full spectrum of accounting areas including financial and managerial accounting, information systems, the public sector and not-for-profit organizations, auditing, business law, and tax.

Because the demands on today's accounting professional require that individuals entering the field have a complete understanding of their professional, ethical, and social responsibilities, the program stresses the development of the individual's professional intellect, insight, and conduct. Each student will be challenged by a wide variety of teaching techniques—the traditional lecture and examination method, the case method, seminars, and directed study. The curriculum is organized to provide for the extensive use of comprehensive oral and written assignments, analytical practice sets, and the exercise of professional judgment and decision-making. Computer resources are fully integrated into the learning process, especially as a tool for analysis and problem-solving.

The curriculum is designed to accommodate students seeking careers in public accounting, industry, and the public sector. Students are required to complete a comprehensive 136-hour program of studies. The program provides for a minimum of 55 hours of course

work in communications, mathematics, social sciences, humanities, and natural sciences; 36 hours of study in the common body of knowledge in business administration and economics; 35 hours of accounting and business law; and 10 hours of free electives.

Courses

ACCOUNTING

NOTE: Enrollment in 300- and 400-level accounting courses is restricted to students who have completed at least 58 credits. In addition, CBE students must have earned at least a 2.4 GPA in the CBE predictor courses.

No course (CBE or outside the college) that is required in a CEB student's major may be taken by CBE undergraduates on a P/F basis, with the exception of courses that are taught only on a P/F basis. Only upper-division CBE courses used as free electives may be taken by CBE undergraduates on a P/F basis.

Acctg **200** (s) **Seminar** (cr arr). Prereq: perm.

Acctg **201 Principles of Accounting** (3 cr) (C). Description and derivation of the primary financial statements prepared by accountants; accounting rationale; reports to stockholders and other investors. May involve some evening exams.

Acctg **202 Managerial Accounting** (3) (C). Intro to cost behavior and managerial use of accounting information for planning, control, and performance evaluation. May involve some evening exams.

Acctg **203** (s) **Workshop** (cr arr). Prereq: perm.

Acctg **204** (s) **Special Topics** (cr arr).

Acctg **299** (s) **Directed Study** (cr arr). Individual sections may be graded P/F. Prereq: perm.

Acctg **300 Accounting Concepts and Systems** (3 cr). Carries no cr after 301. Foundations of accounting concepts and theories; conceptual framework of accounting; intro to accounting information systems; includes computer applications reinforced by practice cases; wordprocessing and spreadsheet software proficiency reqd. May involve some evening exams. Prereq: Acctg 201, 202; coreq: Bus 332, 350.

Acctg **301 Financial Accounting and Reporting I** (3 cr). Financial reporting issues related to assets, liabilities, and stockholders' equity; emphasis on general purpose financial statements for external users. May involve some evening exams. Prereq: Acctg 300.

Acctg **302 Financial Accounting and Reporting II** (3 cr). Financial reporting issues on special areas including leases, pensions, deferred taxes, earnings per share, changing prices, and accounting changes. May involve some evening exams. Prereq: Acctg 301.

Acctg **305 Accounting Information Systems** (3 cr). Accounting info systems as collector, effective control of organizations; system analysis, design, implementation, and evaluation as they relate to major transaction cycles; sales, purchases, production, payroll, cash receipts, and disbursements. May involve some evening exams. Prereq: Acctg 300.

Acctg **330 Accounting for Public Sector Organizations** (3 cr). Conceptual and procedural issues involving accounting, reporting, and auditing public sector organizations including state and local governments, universities, hospitals, and health and welfare organizations. May involve some evening exams. Prereq: Acctg 300.

Acctg **381 Financial and Administrative Accounting** (3 cr). Not open for cr to accounting majors. Management accounting concepts with emphasis on planning control and decision techniques; topics include budgeting, cost concepts, control systems. May involve some evening exams. Prereq: Acctg 202.

Acctg **385 Cost and Management Accounting** (3 cr). Accumulation of product and activity costs for various types of entities through use of management information system; appropriate use of cost data in decision making. May involve some evening exams. Prereq: Acctg 300.

Acctg **395 Fundamentals of Accounting** (2-4 cr, max 4). Primarily for students in the M.B.A. program. Financial statements, limitation of data, partnership and corporate accounting, financial and cost analysis, and interpretation. May involve some evening exams. Prereq: perm.

Acctg **399 Accounting Internship Program** (1-3 cr, max 3). Graded P/F. Provide career-relevant learning experience in actual work setting and expose employers to students. Prereq: accounting major and perm.

Acctg **400** (s) **Seminar** (cr arr). Prereq: perm.

Acctg **401 Financial Accounting and Reporting III** (3 cr). Accounting and reporting issues for complex organizations; consolidations, partnerships, foreign currency, and interim/segment reporting. May involve some evening exams. Prereq: Acctg 301.

Acctg **403** (s) **Workshop** (cr arr). Prereq: perm.

Acctg **404** (s) **Special Topics** (cr arr).

Acctg **J405/J505*** (s) **Professional Development** (cr arr). Credit earned in these courses will not be accepted toward graduate degree programs. Prereq: perm.

Acctg **483 Federal and State Taxes I** (3 cr). Income determination, deductions, accounting methods, sales of property, deferral of tax, taxation of the individual, tax research, with primary emphasis on tax planning; the case method is used. Prereq: Acctg 202 (BLaw 366, BLaw 466, and sr standing recommended).

Acctg **484 Federal and State Taxes II** (3 cr). Taxation of corporations and partnerships with emphasis on tax planning, tax research; the case method is used. Prereq: Acctg 202 (BLaw 366, BLaw 466, Acctg 483, and sr standing recommended).

Acctg **485 Federal Gift and Estate Taxation and Personal Financial Planning** (3 cr). Gift and estate tax consequences on property transfer during life and at death, tax research, and estate planning and personal financial planning. May involve some evening exams. Prereq: Acctg 483, 484.

Acctg **486 Advanced Cost and Management Accounting** (3 cr). Special applications of management accounting techniques for mgt planning and control; current developments in management accounting. May involve some evening exams. Prereq: Acctg 385; coreq: Bus 370.

Acctg **491 Accounting Theory** (3 cr). Accounting theory and contemporary issues in financial accounting. May involve some evening exams. Prereq: Acctg 301.

Acctg **493 Auditing Theory** (3 cr). Concepts, standards, and methods in audit judgment formulation; independent auditor's role, legal responsibilities, and codes of ethical conduct. May involve some evening exams. Prereq: Acctg 301, 305.

Acctg **494 Auditing Procedures** (3 cr). Application of auditing prin and standards in internal control evaluation, audit program development, statistical sampling, EDP auditing and SEC Practice; exploration of important topical issues in accounting profession. May involve some evening exams. Prereq: Acctg 493.

Acctg **498 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

Acctg **499** (s) **Directed Study** (cr arr). Individual sections may be graded P/F. Prereq: perm.

Acctg **501** (s) **Seminar** (cr arr). Prereq: perm.

Acctg **502** (s) **Directed Study** (cr arr). Individual sections may be graded P/F. Prereq: perm.

Acctg **504** (s) **Special Topics** (cr arr).

Acctg **505** (s) **Professional Development** (cr arr). See Acctg J405/J505.

Acctg **520 Accounting for Managers and Investors** (3 cr). Development of skills in use of accounting information to enhance management and/or investment decision-making, survey of fundamentals of financial and managerial accounting issues, procedures, and practices. Prereq: Acctg 395 or equiv.

Acctg **586 Costs: Relevance, Measurement, and Applications** (3 cr). Development of cost control. Prereq: perm.

BUSINESS LAW

BLaw **265 Legal Environment of Business** (3 cr) (C). Law and its relationship to society; legal framework of business enterprises; court organization and operation; private property and contracts as basic concepts in a free enterprise system. May involve evening exams.

BLaw **366 Commercial Law: Business Organizations** (3 cr). Law of agency, partnerships, and corporations. May involve some evening exams. Prereq: BLaw 265.

BLaw **466 Commercial Law: The Uniform Commercial Code** (3 cr). Law of sales, bailments, bulk sales, commercial paper, and security interests in personal property. May involve some evening exams. Prereq: BLaw 366.

Curricular Requirements

ACCOUNTING (B.S.BUS.)

This curriculum is designed to provide a broad range of accounting-oriented career opportunities and includes a well-defined body of knowledge and rigorous, comprehensive examinations to test such knowledge. Due to the magnitude of knowledge required, most accounting students will need more than eight semesters to obtain their undergraduate degree. Accounting students may want to consider the Accounting Internship Program that enables students to gain practical experience. Normally these internships involve three to six months away from the campus. Accounting professors are available as advisers to tailor the curriculum and the Internship Program to meet the needs of individual students.

Required course work includes the university requirements (see regulation J-3), the general requirements for graduation from the College of Business and Economics (see part 4), and:

Course	Credits
Acctg 300 Accounting Concepts & Systems	3
Acctg 301 Financial Accounting & Reporting I	3
Acctg 305 Accounting Information Systems	3
Acctg 330 Accounting for Public Sector Organizations	3
Acctg 385 Costs & Management Accounting	3
Acctg 483 Federal & State Taxes I	3
Acctg 493 Auditing Theory	3
BLaw 366 Commercial Law: Business Organizations	3
Upper-division accounting electives	11

The minimum number of credits for the degree is 136. No more than 36 credits of upper-division accounting courses beyond Acctg 201 and 202 may be included in the 136 credits required for the degree.

ADULT EDUCATION—see Division of Vocational Teacher and Adult Education

Aerospace Studies

William Johansen, Head (Student Union Annex). Faculty: Kenneth W. Bottemiller, James C. Hatfield, Brett A. Hyde, William A. Johansen.

The Air Force Reserve Officer Training Corps (ROTC) offers to eligible students education and training that leads to a commission as a second lieutenant in the U.S. Air Force. Air Force ROTC students may major in any degree program offered at UI; they supplement their major curricula with the specialized aerospace studies courses to prepare for active commissioned service.

Four-Year Program (General Military Course and Professional Officer Course). A formal application is not required for students entering the four-year program. They may register for the program at the same time and in the same manner as they enroll in their other college courses. During their freshman and sophomore years, students enroll in the General Military Course (GMC), and there is NO MILITARY OBLIGATION. They then may compete for entry into the Professional Officer Course (POC), which is normally taken during the last two years of college. Selection into the POC is highly competitive and is based on qualification on an Air Force medical examination, a physical fitness test, scores achieved on the Air Force Officer Qualifying Test (AFOQT), successful completion of a paid four-week field training course at an Air Force base, and the recommendation of the professor of aerospace studies.

Two-Year Program (Professional Officer Course). The two-year program consists of the Professional Officer Course (POC), the last two years of the four-year program. It is designed to provide greater flexibility to meet the needs of the students desiring Air Force opportunities. The basic requirement is that applicants have at least two academic years remaining at either the undergraduate or graduate level, or a combination of both.

After being nominated by the professor of aerospace studies, applicants seeking enrollment in the two-year program are evaluated on scores achieved on the AFOQT, the Air Force medical examination, a physical fitness test, and a personal interview. Because the processing procedure must be completed approximately six months in advance of intended enrollment, interested students should apply early in the fall preceding the fall term in which they plan to enter the program. Application should be made in writing or by a personal visit to the professor of aerospace studies, Student Union Annex. After successfully completing a paid six-week field training course at an Air Force base during the summer, applicants meeting all requirements may then enroll in the Professional Officer Course.

Air Force ROTC also offers financial assistance to selected students in the form of scholarships and subsistence allowances. The students compete for the scholarships through a national screening process. The Air Force offers 3 1/2-, 3-, 2 1/2-, and 2-year scholarships that cover student fees and the cost of required labs, include a textbook allowance, and provide a $100-a-month subsistence allowance for each school year a student is on scholarship. Students interested in applying for scholarships should get in touch with this department. Nonscholarship students receive the $100-a-month subsistence allowance while in the POC.

Field Training. Air Force ROTC field training is offered during the summer months at selected Air Force bases throughout the U.S. Students in the four-year program participate in four weeks of field training, usually between their sophomore and junior years. Students applying for entry into the two-year program must successfully complete six weeks of field training before enrollment in the Professional Officer Course. The major areas of study in the four-week field training program include junior officer training, aircraft and aircrew orientation, career orientation, survival training, base functions and Air Force environment, and physical training. The major areas of study included in the six-week field training program are essentially the same as those conducted at four-week field training and in the General Military Course including Leadership Laboratory.

Leadership Laboratory. Leadership Laboratory is taken an average of two hours a week throughout the student's enrollment in Air Force ROTC. Instruction is conducted within the framework of an organized cadet corps with a progression of experiences designed to develop each student's leadership potential. Leadership Laboratory involves a study of Air Force customs and courtesies, drill and ceremonies, career opportunities in the Air Force, and the life and work of an Air Force junior officer. Students develop their leadership potential in a practical, supervised laboratory, which typically includes field trips to Air Force installations throughout the U.S.

Aerospace Studies Courses

Aero **101-102 U.S. Aerospace Forces** (2 cr). Aero 101: structure and capabilities of the U.S. aerospace strategic and defensive air forces; relationship of the individual to the Air Force. Aero 102: structure and capabilities of the U.S. aerospace general purpose and support forces; responsibilities and opportunities of the Air Force officer. One lec and 2 hrs of lab a wk.

Aero **201-202 Evolution of Aerospace Power** (2 cr). Aero 201: growth and development of airpower doctrine and concepts from the origins of manned flight through WWII. Aero 202: development of airpower doctrine and concepts from the Berlin Airlift to today; peaceful employment of airpower as a force for stability. One lec and 2 hrs of lab a wk. Prereq: perm of dept.

Aero **291 Four-Week Field Training Course** (2 cr). Successful completion of this unit meets the prereq for the Professional Officer Course. Four weeks of orientation in military skills, career fields, military operations, and leadership training, conducted during the summer at an active Air Force installation. Reqd for AFROTC cadets before being commissioned. Graded P/F. Prereq: Aero 101-102, 201-202, and perm of dept.

Aero **292 Six-Week Field Training Course** (6 cr). Cr will not be allowed in Aero 292 and Aero 101-102-201-202-291. Application must be made at least six months before attendance date. Successful completion of this course meets the prereq for the Professional Officer course. Six wks of academics and orientation in military skills, career fields, military operations, and leadership training, conducted during the summer at an active Air Force installation. Reqd for two-year AFROTC cadets before entering Aero 311. Graded P/F. Prereq: two yrs' college work and perm of dept.

Aero **311 Air Force Leadership** (4 cr). Professional leadership and management responsibilities, Air Force communications, and functions reqd of career Air Force officers. Three lec and 2 hrs of lab a wk. Prereq: Aero 291 or 292, or perm of dept.

Aero **312 Air Force Management** (4 cr). Management principles and functions pertaining to command and supervision. Three lec and 2 hrs of lab a wk.

Aero **411 The Professional Military Officer** (4 cr). Military officership as a profession; role of national security forces in the U.S. civil-military interactions and relations. Three lec and 2 hrs of lab a wk.

Aero **412 National Security Forces in Contemporary American Society** (4 cr). Defense strategy and conflict management; formulation and implementation of U.S. defense policy; intro to the military justice system. Three lec and 2 hrs of lab a wk; one 1-day field trip.

Aero **499** (s) **Directed Study** (cr arr). Prereq: perm of dept.

Programs

The following programs are designed to provide students with a good military and leadership foundation so students completing them can serve as effective Air Force officers. They are not designed to be academic majors and thus no bachelor's degree is offered.

For a student to receive an Air Force commission, he or she must have completed either the Four-Year Program or the Two-Year Program. Prior-service students should consult the department to find out what course of study will be required for them. In addition to the courses in aerospace studies, students must take a course in mathematical reasoning. Scholarship students must take two semesters of a foreign language.

Four-Year Program

Course	Credits
Aero 101-102 U.S. Aerospace Forces	4
Aero 201-202 Evolution of Aerospace Power	4
Aero 291 Four-Week Field Training Course	2
Aero 311 Air Force Leadership	4
Aero 312 Air Force Management	4
Aero 411 The Professional Military Officer	4
Aero 412 National Security Forces	4

Two-Year Program

Course	Credits
Aero 292 Six-Week Field Training Course	6
Aero 311 Air Force Leadership	4
Aero 312 Air Force Management	4
Aero 411 The Professional Military Officer	4
Aero 412 National Security Forces	4

Department of Agricultural and Extension Education

Lou E. Riesenberg, Dept. Head (224 Morrill Hall). Faculty: Maurice E. Johnson, John P. Mundt, Douglas A. Pals, Lou E. Riesenberg. Affiliate Faculty: L. Devere Burton, Richard L. Ledington, Michael G. Rush. Adjunct Faculty: Laurie L. Lancaster.

The mission of the Department of Agricultural and Extension Education includes teaching, research, and service. The specific objectives of the department are: (1) to prepare educators for employment in teaching agriculture and extension programs; (2) to provide service and direction to FFA in Idaho; (3) to provide an opportunity for graduate study in the areas of agricultural and extension education; (4) to assist in providing inservice education for agricultural educators in Idaho; (5) to provide service to related agencies and organizations for the support of education and the development of human resources; (6) to conduct quality research in agricultural and extension education; (7) to assist in maintaining viable agricultural education programs; and (8) to assist in the development of information and instructional materials for the support of agricultural educators and extension personnel.

Courses in animal science, agricultural economics, agricultural mechanics, entomological science, plant science, and soil science will prepare graduates to teach these areas as secondary agriculture instructors and develop educational programs as county extension faculty. The agricultural education curriculum is approved by the State Board for Vocational Education. Graduates who have completed a minimum of 24 credits in agricultural education and who meet the state certification requirements for a standard secondary teaching certificate are qualified to teach secondary agriculture. Students must be admitted to the Teacher Education Program, which requires a grade-point average of at least 2.50 and success in the National Teacher Exam, before being allowed to enroll in upper-division teacher education courses and participate in student teaching. In addition, government and agribusiness agencies that seek persons with training in agriculture and education provide employment opportunities for graduates of this curriculum. Courses provide students an opportunity to develop employment opportunities in teaching agriculture, cooperative extension, and agribusiness occupations.

The department provides opportunities for professional growth and development to agricultural educators through a planned program of graduate study. The pursuit of an M.S. degree allows for the development of problem-solving skills through scientific investigation of appropriate research topics. Graduate work in agricultural and extension education is offered with the opportunity for students to elect options in agricultural sciences, extension education, vocational teacher education, international agricultural education, or other areas that parallel their career goals. Because of the diversity of research efforts by departmental faculty members, a graduate student has a wide variety of specializations from which to choose a thesis topic. Students with this degree are well prepared to move into a job market or to pursue a Ph.D. program at another institution.

The department welcomes inquiries about its programs and suggests that anyone interested in possible pursuit of a degree in agricultural and extension education should contact the department (telephone 208/885-6358).

Courses

AGRICULTURAL EDUCATION

AgEd **180 Introduction to Agricultural Education** (1 cr). Overview of purposes and career opportunities in agricultural education; role of secondary agriculture instructor in secondary school systems. Accelerated; first half of fall semester.

AgEd **181 Introduction to Extension Education** (1 cr). Overview of purpose and career opportunities available in extension education profession; role of cooperative extension faculty; basic principles and practices of Cooperative Extension System including related legislation. Accelerated; second half of fall semester.

AgEd **200** (s) **Seminar** (cr arr). Prereq: perm.

AgEd **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

AgEd **211 Agricultural Education Skills** (1 cr). Alt/yrs. Technical agriculture skills applicable to teaching agriculture.

AgEd **299** (s) **Directed Study** (cr arr). Prereq: perm.

AgEd **351 Principles of Vocational Education** (2 cr) (C). See VocEd J351/J551.

AgEd **356 Experiential and Leadership Programs** (1 cr). Principles and practices in planning, developing, conducting, supervising, and evaluating experiential and leadership programs for agricultural education, home economics education, and 4-H. Coreq: AgEd 358 or 359 or HEc 357.

AgEd **358 Supervising FFA and SAE Programs** (2 cr). Role of secondary agriculture instructors in supervising FFA and SAE programs. Coreq: AgEd 356.

AgEd **359 Developing 4-H Youth Programs** (1 cr). Application of leadership and management principles of 4-H/youth program planning and development; role of 4-H/youth agent and volunteer leader. Coreq: AgEd 356.

AgEd **400** (s) **Seminar** (cr arr). Prereq: perm.

AgEd **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

AgEd **J409/J509 Adult Education, Training and Development in Agriculture and Home Economics** (3 cr). Same as HEc J409/J509. Alt/yrs. Social and psychological factors affecting adult motivation and learning, development of leadership and group dynamics; nature, philosophy, and concepts of adult life-long learning related to agricultural and extension education, inservice training and retraining in agribusiness; human resource development in agriculture and home economics within federal and state agencies, business, commerce, and industry. Cr earned in AgEd 509 by completion of in-depth paper on some aspect of adult education. Prereq for AgEd 509: perm of dept.

AgEd **J448/J548 Principles and Practices of Extension Education** (3 cr). Alt/yrs. Philosophy and principles, social and economic significance of extension education in agriculture, home economics, and 4-H youth development; exam of behavioral science concepts in organization, development, and management of extension programs. Cr earned in AgEd 548 by completion of in-depth paper on some aspect of extension education. Prereq for AgEd 548: perm of dept.

AgEd **452 Methods of Teaching Agriculture** (3 cr). Procedures of identifying and selecting instructional methods and materials, planning, and student evaluation criteria to effectively teach agriculture. Five lec and one 3-hr lab a wk for 8 wks.

AgEd **453 Program Planning in Secondary and Adult Agricultural Education** (1 or 3 cr). Planning, organizing, and implementing secondary and adult programs in agriculture. Includes only the adult section of the course when taken for 1 cr.

AgEd **454 Facilities Organization & Management** (2 cr). Applications of efficient planning, organizing, and teaching skills reqd in management of lab and shop facilities. Two lec and one 3-hr lab a wk for 8 wks.

AgEd **459 Cooperative Extension Practicum** (1-9 cr, max 9). Observation, participation, and supervised teaching experience with an extension agent in a selected county. Prereq: jr or sr standing and perm.

AgEd **460 Practicum: Secondary School Teaching in Agriculture** (9 cr). Nine wks of practical experience student teaching in secondary agriculture program; in addition each student will be expected to complete one wk of early field-based experience at their student teaching center, to be completed the first wk of school after Jan. 1. Prereq: GPA of 2.50, admission to the Teacher Education Program, and perm of dept.

AgEd **470 Proseminar in Agricultural Education** (1 cr). Issues and problems in agricultural education.

AgEd **499** (s) **Directed Study** (cr arr). Prereq: perm.

AgEd **500 Master's Research and Thesis** (cr arr).

AgEd **501** (s) **Seminar** (cr arr). Prereq: perm.

AgEd **502** (s) **Directed Study** (cr arr). Prereq: perm.

AgEd **503** (s) **Workshop** (cr arr). Prereq: perm.

AgEd **506** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

AgEd **509 Adult Education, Training and Developments in Agriculture and Home Economics** (3 cr). See AgEd J409/J509.

AgEd **548 Principles and Practices of Extension Education** (3 cr). See AgEd J448/J548.

AgEd **557 Problems in Teaching Agriculture** (1-3 cr, max 9). Methods and new developments. Prereq: perm.

AgEd **560 Beginning Teacher Induction in Agricultural Education** (2 cr). On-site clinical supervision, technical assistance, and leadership to beginning teachers of secondary agricultural education programs.

AgEd **562 Instructional Methods in Agricultural Education** (3 cr). Innovations and advanced principles in teaching methods and materials.

AgEd **583 Program Evaluation and Planning in Agricultural and Extension Education** (3 cr). Alt/yrs. Criteria and procedures for evaluation of programs in agricultural and extension education; selection and construction of evaluation devices; use of results in program planning and implementation.

AgEd **598** (s) **Internship** (cr arr). Prereq: perm.

AgEd **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

AGRICULTURE (GENERAL)

PREREQUISITE: Enrollment in courses in this subject field requires perm of the department.

Ag **200 Seminar** (cr arr). Prereq: perm.

Ag **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Ag **299** (s) **Directed Study** (cr arr). Prereq: perm.

Ag **389 Internship** (1-6 cr, max 6). Graded P/F. Prereq: perm.

Ag **404** (s) **Special Topics** (cr arr).

Ag **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Ag **499** (s) **Directed Study** (cr arr). Prereq: perm.

Curricular Requirements

AGRICULTURAL EDUCATION (B.S.Ag.Ed.)

The following curriculum is approved by the State Board of Vocational Education for the preparation of high school agriculture instructors. Graduates who have completed at least 24 credits in agricultural education, and who meet the state certification requirements for a Standard Secondary Teaching Certificate, are eligible to teach secondary agriculture in Idaho. In addition, government and business agencies and the Cooperative Extension Service that seek persons with training in agriculture and education provide employment opportunities for graduates of this curriculum.

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
AgEd 180 Introduction to Agricultural Education	1
AgEd 351 Principles of Vocational Education	2
AgEd 356 Experiential & Leadership Programs	1
AgEd 358 Supervising FFA & SAE Programs	2
AgEd 452 Methods of Teaching Agriculture	3
AgEd 453 Program Planning in Secondary & Adult Ag Ed	3
AgEd 454 Facilities Organization & Management	2
AgEd 460 Practicum: Secondary School Teaching in Ag	9
AgEd 470 Proseminar in Agricultural Education	1
AgMech 107 Beginning Welding	2
AgMech 202 Agricultural Shop Practices	2
AgMech 210 Small Engines	2
CommG 131 Fundamentals of Public Speaking	2
Ed 201 Introduction to Teaching	2
Ed 312 Educational Psychology	2
Ed 340 Methods of Teaching Content Reading	3
Eng 313 Business Writing or 317 Tech & Engr Report Writing or 205 Adv Expository Writing	3
Math 140 Pre-calculus Algebra & Analytic Geom or 111 Finite Math	3-4
Computer science course	3
Ag electives, incl a minimum of 6 cr in ag econ, 6 cr in animal sc, 6 cr in plant sc, and 4 cr in soils	40
Natural and applied sc electives, incl 4 cr in chem and 4 cr in biol sc	16
Humanities and social sc electives, incl Econ 152 and Psych 100	14
Electives to total 132 cr for the degree	—

GENERAL AGRICULTURE (B.S.Gen.Ag.)

Designed for students interested in a broad education with emphasis on agriculture. The flexibility permitted enables students to get the education needed in a general farming/ranching operation and/or prepare to work as a generalist within extension settings. Students who have not decided on a major in agriculture may enroll in this curriculum and take courses in a number of departments to decide on a departmental major. Those who start in this curriculum will be informed of the requirements in other majors and plan course selections to avoid loss of time if they transfer to another major. Note: No student may become a candidate for the B.S.Gen.Ag. degree who has already earned a degree in the College of Agriculture or who is a candidate for another degree offered by the college.

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
CommG 131 Fundamentals of Public Speaking	2
Eng 205 Adv Expository Writing or 313 Business Writing or 317 Tech & Engr Report Writing	3
Ag econ, business, and accounting courses	12
Agriculture courses, incl courses in at least four depts or divisions	50
Humanities and social sc electives, incl Econ 151 and/or 152	14
Math, statistics, and computer sc courses, incl at least 3 cr in math	6
Natural and applied sc courses, incl at least 4 cr of chem and 4 additional cr of either chem or physics	16
Electives to total 132 cr for the degree	—

Academic Minor Requirements

AGRICULTURAL EXTENSION EDUCATION MINOR

Course	Credits
AgEd 181 Intro to Extension Education	1
AgEd 356 Experiential & Leadership Programs	1
AgEd 359 Developing 4-H Youth Programs	1
AgEd 409 Adult Ed, Training & Development (or equivalent course)	3
AgEd 448 Prin & Practices of Extension Education	3
AgEd 452 Methods of Teaching Agriculture	3
AgEd 459 Cooperative Extension Practicum	9

Department of Agricultural Economics and Rural Sociology

James R. Nelson, Dept. Head (39A Iddings Wing, Ag. Sc. Bldg.). Faculty: Ahmed A. Araji, John E. Carlson, Robert D. Carver, Stephen C. Cooke, C. Wilson Gray, Joseph F. Guenthner, Joel R. Hamilton, James R. Jones, Biing-Hwan Lin, Roger B. Long, LeRoy D. Luft, Corinne M. Lyle, Larry D. Makus, Gerald E. Marousek, Neil L. Meyer, Edgar L. Michalson, James R. Nelson, Paul E. Patterson, Neil R. Rimbey, David J. Walker, Russell V. Withers. Adjunct Faculty: Richard D. Gibb.

Agricultural economics is an applied branch of economics. It is a social science that deals with economic problems in agriculture, the food industry, rural communities, and the use and conservation of our natural resources. Economic principles and theories are used to obtain maximum economic efficiency in the production and marketing of agricultural commodities and in the use of natural resources in rural areas.

The agricultural economics program prepares students to solve problems faced by farmers and ranchers, agricultural marketing and supply companies, natural resource agencies, and rural communities. The department offers the degree of Bachelor of Science in Agricultural Economics with majors in agribusiness, agricultural economics, and natural resources and rural development. Areas of study within the majors include agricultural finance, agricultural policy, marketing, farm and resource management, rural community development, international trade and development, and management of agribusiness firms.

The agribusiness major prepares students in the management functions of farms, ranches, and businesses involved with the production and marketing of farm commodities and farm production inputs. The agricultural economics major prepares students to become professional economists in marketing and supply firms and governmental agencies—many students pursue advanced degrees in this field before entering the profession. Students completing the natural resources and rural development major are prepared to enter private industry and governmental agencies that deal with economic analysis of natural resource use and rural development problems. The demand for graduates in all three options has consistently exceeded the supply.

The department also offers the degree of Master of Science with a major in agricultural economics. Because of the diversity of research efforts by departmental faculty, a graduate student has a wide variety of specializations from which to choose a thesis project. Students with this degree are well qualified for employment in industry or public service or to pursue a Ph.D. degree.

The department welcomes inquiries about its program and suggests that anyone interested in possible pursuit of a degree in agricultural economics should get in touch with the department head (telephone 208/885-7635).

Agricultural Economics Courses

AgEc **101 Agricultural Economics and Agribusiness** (3 cr). Applications of economic and business principles to agriculture industry; factors affecting production and marketing of agricultural products.

AgEc **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

AgEc **278 Principles of Farm and Ranch Management** (4 cr) (C). Decision making and profit maximization using economic principles, records, enterprise analysis, and comparison of alternative farming practices. Three lec and one 2-hr lab a wk. Prereq: AgEc 101 or Econ 152 or perm.

AgEc **289 Agricultural Markets and Prices** (3 cr). Economics of agricultural markets and pricing institutions; analysis of supply, demand, elasticity, futures markets; effects on agricultural markets and prices. Prereq or coreq: Econ 152.

AgEc **332 Economics of Agricultural Development** (3 cr). Problems associated with the economics of development of major agricultural areas of the world. Prereq: prin of econ.

AgEc **356 Agricultural Programs and Policies** (3 cr). Goals, methods, results of econ programs and policies in agriculture, including role of governmental and farm organizations. One 1-day field trip. Prereq: Econ 151, 152.

AgEc **ID361 Farm and Natural Resource Appraisal** (3 cr). Same as For 361. WSU Ag Ec 361. Methods; factors affecting the value of land and related resources; valuations for loans, sale, assessment, condemnation, and other purposes; procedures used by governmental and commercial agencies. One 1-day field trip. Prereq: AgEc 278 or Econ 152 or perm.

AgEc **383 Economics for Natural Resource Managers** (3 cr). See For 383.

AgEc **389 Internship** (1-6 cr, max 6). Graded P/F. Prereq: perm of dept.

AgEc 391 Agribusiness Management (3 cr). Economic theory of business; applications to management of agricultural processing and service firms; accounting, statistics, and efficiency studies for problem-solving. Prereq: Econ 152 and 3 cr in accounting.

AgEc **394 Analytical Techniques in Agribusiness and Economics** (3 cr) (AgEc 414). Linear equations, linear programming, marginal analysis, and statistical methods applied to problem solving in agribusiness and economics. Prereq: Econ 321 and Math 160 or equiv.

AgEc **404** (s) **Special Topics** (cr arr).

AgEc **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

AgEc **WS430 Financial Arrangements in Agriculture** (3 cr). WSU Ag Ec 430.

AgEc **451 Land and Natural Resource Economics** (3 cr). Agricultural, forest, and mineral land use and classification; factors affecting land use; ownership, tenure, taxation, values, credit, and governmental policies. Prereq: Econ 321.

AgEc **453 Agricultural Price Analysis** (3 cr). Analytical tools for explaining and predicting price behavior of agricultural products; application of economics and statistics to price analysis. Prereq: Econ 321 and Stat 251, or perm.

AgEc **467 Economics of Rural Community Development** (3 cr). Economic theory, analytical methods, and literature relevant to study of development of rural areas. Prereq: Econ 151, 152.

AgEc **477 Economics of Developing Countries** (3 cr). See Econ 477.

AgEc **481 Agricultural Market Analysis** (3 cr). Structure, competition, and economic performance of agricultural product and input markets. Prereq: Econ 321, 372, or perm.

AgEc **493 Agricultural Production Economics** (3 cr). Economic theory related to agricultural production at the enterprise, firm, and industry levels. Prereq: AgEc 278 and Econ 321.

AgEc **499** (s) **Directed Study** (cr arr). Prereq: perm.

AgEc **500 Master's Research and Thesis** (cr arr).

AgEc **501** (s) **Seminar** (cr arr). Prereq: perm.

AgEc **502** (s) **Directed Study** (cr arr). Prereq: perm.

AgEc **506** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

AgEc **507 Research Methodology** (3 cr). Same as Econ, HEc, and Soc 507. Theoretical background of the scientific method applied to social science research; organization, procedures, reporting, and evaluation of research. Prereq: grad standing and perm.

AgEc **508 Problems in Production Economics Research** (3 cr). Application of mathematical programming to issues in agricultural production. Prereq: AgEc 493 and Stat 401.

AgEc **509 Advanced Microeconomic Theory I** (3 cr). See Econ 509.

AgEc **510 Advanced Microeconomic Theory II** (3 cr). See Econ 510.

AgEc **522 Advanced Aggregate Economics** (3 cr). See Econ 522.

AgEc **524 Agricultural Trade and Development** (3 cr). Economics of international agricultural trade and development, with emphasis on policy and research issues that arise from interaction of economic events in the world food economy. Prereq: Econ 474 or perm.

AgEc **525 Econometrics** (3 cr). Same as Econ 525. Mathematical formulation of theoretical economic models that serve as the basis for empirical investigations of economic behavior. Prereq: Econ 321 and 6 cr in stat.

AgEc **551 Economics of Natural Resource Development** (3 cr). Allocation of natural resources over time and among uses; welfare economics; project evaluation and benefit cost analysis; valuation of extramarket goods; problems for public policy. Prereq: AgEc 451 or equiv and Econ 509 or perm.

AgEc **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Curricular Requirements

The agricultural economics area has three programs designed to prepare students for professional careers in the agricultural economics profession. The agribusiness major is designed to prepare students for employment as managers, administrators, or for managerial-related positions in agribusiness. The agricultural economics major is designed to provide students with the theory behind decisions concerning agricultural production, marketing, resource use, pricing, and policy. The natural resource and rural development major is designed to provide understanding of the economics of pricing, public policy, and management of natural resources and community and human resources in rural society. Students in this major may elect courses in supporting fields for a focus in natural resource economics or in rural development economics.

CORE COURSES FOR B.S.AG.ECON.

Course	Credits
AgEc 101 Agricultural Economics & Agribusiness	3
AgEc 278 Principles of Farm & Ranch Management	4
AgEc 356 Agricultural Programs & Policies	3
Biol 100 Intro to Biology or 201 Intro to Life Sciences or Bact 250 General Microbiology	4
Chem 103 Intro to Chemistry or 111 Prin of Chemistry	4
CommG 131 Fundamentals of Public Speaking	2
CS 102 Programming & Problem Solving for Scientists or 112 Intro to Problem Solving & Programming	3
Econ 151, 152 Principles of Economics (may not also be used to satisfy the core requirements in regulation J-3-d)	6
Econ 321 Intermediate Microeconomic Analysis	3
Eng 317 Technical & Engr Report Writing	3
Stat 251 Principles of Statistics	3
Humanities and social sciences (at least 6 cr of each; may not include Econ 151-152)	14

AGRICULTURAL ECONOMICS (B.S.Ag.Econ.)

Required course work includes the university requirements (see regulation J-3), the agricultural economics core, and:

Course	Credits
AgEc 289 Agricultural Markets & Prices	3
AgEc 453 Agricultural Price Analysis	3
AgEc 481 Agricultural Market Analysis	3
AgEc 493 Agricultural Production Economics	3
Acctg 201 Principles of Accounting	3
Acctg 202 Managerial Accounting	3
Econ 372 Intermediate Macroeconomic Analysis	3
Math 180 Analytic Geometry & Calculus I	4
Math, stat, or CS electives above the specific requirements	3-4
Agricultural economics electives	3
Economics electives	6
Technical agriculture electives	12
Electives to total 132 cr for the degree	—

AGRIBUSINESS (B.S.Ag.Econ.)

Required course work includes the university requirements (see regulation J-3), the agricultural economics core, and:

Course	Credits
AgEc 289 Agricultural Markets & Prices	3
AgEc 391 Agribusiness Management	3
AgEc 394 Analytical Techniques in Agribusiness & Economics	3
Two of the following courses AgEc 453 Agricultural Price Analysis AgEc 481 Agricultural Market Analysis AgEc 493 Agricultural Production Economics	6
Acctg 201 Principles of Accounting	3
Acctg 202 Managerial Accounting	3
Acctg 381 Financial & Administrative Accounting	3
BLaw 265 Legal Environment of Business	3
Bus 413 Organizational Behavior	3
Math 160 Survey of Calculus or 180 Analytic Geom & Calc I	4
Math, stat, or CS electives above the specific requirements	3-4
Agricultural economics electives	3
Ag economics, econ, business, or accounting electives	3
Technical agriculture electives	12
Electives to total 132 cr for the degree	—

NATURAL RESOURCES AND RURAL DEVELOPMENT (B.S.Ag.Econ.)

Required course work includes the university requirements (see regulation J-3), the agricultural economics core, and:

Course	Credits
AgEc 451 Land & Natural Resource Economics or 467 Economics of Rural Community Development	3
AgEc 493 Agricultural Production Economics	3
Econ 372 Intermediate Macroeconomic Analysis	3
Econ 430 Regional/Urban Economics	3
Econ 485 Environmental Economics	3
Math 180 Analytic Geometry & Calculus I	4
PolSc 275 American State & Local Government	3
Soc 310 Rural Sociology	3
Agricultural economics electives (select from AgEc 289, 332, 361, 394, 451, and 467)	9
Math, stat, or CS electives above the specific requirements	3-4
Supporting field electives (see list in dept office)	18
Electives to total 132 cr for the degree	—

Academic Minor Requirements

AGRICULTURAL ECONOMICS MINOR

Course	Credits
AgEc 101 Agricultural Economics & Agribusiness	3
AgEc 278 Principles of Farm & Ranch Management	4

AgEc 289 Agricultural Markets & Prices 3
AgEc 332 Econ of Ag Development or 356 Ag Programs & Policies 3
Two of the following courses 6
AgEc 453 Agricultural Price Analysis
AgEc 481 Agricultural Market Analysis
AgEc 493 Agricultural Production Economics

AGRIBUSINESS MINOR

Course	Credits
AgEc 101 Agricultural Economics & Agribusiness	3
AgEc 278 Principles of Farm & Ranch Management	4
AgEc 289 Agricultural Markets & Prices	3
AgEc 394 Analytical Techniques in Agribusiness & Econ or 453 Ag Price Analysis or 481 Ag Market Analysis	3
Two of the following courses	6
AgEc 356 Agricultural Programs & Policies	
AgEc 361 Farm & Natural Resource Appraisal	
AgEc 391 Agribusiness Management	

NATURAL RESOURCE ECONOMICS AND COMMUNITY DEVELOPMENT MINOR

Course	Credits
AgEc 101 Agricultural Economics & Agribusiness	3
AgEc 278 Principles of Farm & Ranch Management	4
AgEc 356 Agricultural Programs & Policies	3
AgEc 451 Land & Natural Resource Economics or 467 Economics of Rural Community Development	3
Two of the following courses	6
AgEc 332 Economics of Agricultural Development	
AgEc 361 Farm & Natural Resource Appraisal	
AgEc 383 Economics for Natural Resource Managers	

Department of Agricultural Engineering

Delbert W. Fitzsimmons, Acting Dept. Head (102 Ag. Engr. Office Bldg.). Faculty: George L. Bloomsburg, Charles E. Brockway, Mark E. Casada, Edwin A. Dowding, Delbert W. Fitzsimmons, James L. Halderson, Behzad Izadi, Ian R. McCann, Jack M. McHargue, Myron P. Molnau, Charles L. Peterson, Geoffrey J. Shropshire.

Agricultural engineering is the profession that bridges the area between two fields of applied science—engineering and agriculture. It is the engineering discipline oriented to the design of equipment and systems for the production, processing, and transportation of food, feed, natural raw fiber, and forest products and the efficient use of natural resources. Agricultural engineers have the education and interests that make them uniquely capable to develop engineering solutions for agricultural and biological systems from the efficient use of natural resources to the production of plants and animals to the final processing of food, feed, and fiber products.

In contrast to agricultural engineering, which emphasizes the design of systems and equipment, agricultural mechanization emphasizes the use and management of equipment and systems based on an understanding of their design. Agricultural mechanization courses are designed to provide students with basic competences in agricultural power and machinery, agricultural electrification, soil and water management, agricultural buildings, basic shop skills, and systems analysis.

The agricultural engineering program at UI is designed to prepare students for a variety of interesting and rewarding engineering careers. Many graduates are employed as design or development engineers by farm equipment manufacturers, irrigation companies, trade associations, consulting engineering firms, and governmental agencies. Others are self-employed in their own consulting firms, farming, farm equipment manufacturing, and other engineering-related enterprises.

The curriculum leading to the B.S.Ag.E. is accredited by the Engineering Accreditation Commission of the Accrediting Board for Engineering and Technology. Students in this program are eligible to take the Engineer-in-Training (EIT) Examination just before they graduate and to become registered professional engineers after graduating and completing an experience requirement.

The undergraduate degree program in agricultural mechanization (B.S.Ag.Mech.) is designed to prepare students to apply biological, physical, mechanical, and business knowledge to the production, service, sales, application and management of the equipment, and processes used in agriculture. The curriculum stresses courses in agriculture, agricultural mechanization, and basic and applied sciences, and includes a strong background in agricultural economics, accounting, and business. It prepares students for a variety of important and rewarding career opportunities. Many graduates return to farming. Others pursue careers as farm managers or are employed by agriculturally oriented businesses, banking firms, educational institutions, or governmental agencies. This curriculum is recognized by the American Society of Agricultural Engineers.

The agricultural mechanization courses are available to nonmajors interested in obtaining an understanding of the technology used in modern agricultural production systems. A minor in agricultural mechanization can be used to support degree programs in other departments.

Graduate study is offered in agricultural engineering with specialization in irrigation and drainage, hydrology, and soil and water conservation; energy sources, use, and conservation; harvesting, handling, and processing agricultural crops; equipment design and development; and environmental systems and animal waste management. The degrees offered are the Master of Science, the Master of Engineering, and the Doctor of Philosophy.

Courses

AGRICULTURAL ENGINEERING

NOTE: All 300-, 400-, and 500-level agricultural engineering courses require a working knowledge of computers including the use of mainframe and microcomputers, structured programming, electronic spreadsheets, and word processing.

AgE **142 Introduction to Agricultural Engineering** (2 cr). Intro to engineering principles used to solve agricultural problems, including use of computers. One lec and two labs a wk; two half-day field trips.

AgE **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

AgE **242 Agricultural Engineering Analysis and Design** (2 cr). Methods of analyzing and solving engineering problems and intro to elements of design; use of computers in engineering problem solving. Prereq: CS 105 or 112; Math 190.

AgE **299** (s) **Directed Study** (cr arr). Prereq: perm.

AgE **ID351 Hydrology** (3 cr). Same as CE 321. WSU Ag E 341. Analysis of precipitation and runoff events; principles of climatology, evaporation, infiltration, and snowmelt. Prereq: one semester of calculus.

AgE **ID352 Soil and Water Engineering** (3 cr). WSU Ag E 352. Plant-soil-water relationships, applied hydraulics, soil erosion principles and control, drainage, and legal aspects of water resources. Two lec and one 3-hr lab a wk. Prereq: ES 320 and AgE 351.

AgE **ID&WS372 Agricultural Power and Machines** (3 cr). WSU Ag E 362. Performance, operation, and testing of agricultural power units and machinery; functional requirements, force analysis, power transmission, safety, and economics. Two lec and three hrs of lab a wk; one 1-day field trip.

AgE **WS385 Principles of Environmental Control** (3 cr). WSU Ag E 385.

AgE **WS390 Introduction to Soil and Water Engineering** (3 cr). WSU Ag E 390.

AgE **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

AgE **ID&WS-J441/ID&WS-J541 Instrumentation and Measurements** (3 cr). WSU Ag E 584. Sensing elements, signal conditioning, data output and control. Two lec and one 3-hr lab a wk. Additional projects/assignments reqd for grad cr. Prereq for AgE 541: perm.

AgE **ID449 Design of Agricultural Structures** (3 cr). WSU Ag E 472. Design of timber, steel, and reinforced concrete members and connections for agricultural structures. Two lec and one 3-hr lab a wk. Prereq: ES 340.

AgE **ID451 Engineering Hydrology** (3 cr). Same as CE 421. WSU Ag E 451. Hydrologic cycle as applied to engineering projects; hydrograph routing; design hydrographs; intro to hydrologic simulation. Prereq: AgE 351 and ES 320.

AgE **ID-J454/ID-J554 Drainage System Design** (2 cr). WSU Ag E 454/554. Theory and design of subsurface drainage systems in agriculture, waste management, and construction; intro to unsaturated flow. Additional projects/assignments reqd for grad cr. Prereq: ES 320; prereq for AgE 554: perm.

AgE **ID&WS-J456/ID&WS-J556 Irrigation System Design** (3 cr). WSU Ag E 490, 491/591. Crop water requirements, irrigation scheduling and water management, selection and design of irrigation systems, pump selection. Two lec and one 3-hr lab a wk; one 1-day field trip. Additional projects/assignments reqd for grad cr. Prereq: AgE 352.

AgE **458 Open Channel Hydraulics** (3 cr). Same as CE 428. Hydraulics of uniform and varied flow in open channels with fixed and movable beds. Prereq: AgE 352 or CE 322.

AgE **ID461 Agricultural Processing and Environment** (3 cr). WSU Ag E 385. Analysis and design of processing and environmental systems for animal production, crop processing, and storage facilities. Two lec and one 3-hr lab a wk. Prereq: ES 321.

AgE **ID&WS462 Electric Power and Controls** (3 cr). WSU Ag E 380. Design and on-farm use of elec equipment and systems; design of electronic control systems for agricultural applications. Two lec and one 3-hr lab a wk; one 1-day field trip. Prereq: EE 207.

AgE **ID-J474/ID-J574 Fluid Power and Control Systems** (3 cr). WSU Ag E 474/574. Circuit components; circuit design and testing; sequential and feedback control applications. Two lec and one 3-hr lab a wk. Additional projects/assignments reqd for grad cr. Prereq for AgE 574: perm.

AgE **478 Agricultural Engineering Design I** (1 cr). Intro to design process, CAD/CAM facility, product liability, and project scheduling; formulation of a design problem.

AgE **479 Agricultural Engineering Design II** (2 cr). Individual or team design of an agriculture related problem; incl synthesis, analysis, construction, and testing; final report reqd. Two 3-hr labs a wk. Prereq: AgE 478.

AgE **WS-J482/WS-J582 Microcomputer Controls in Agriculture** (3 cr). WSU Ag E 482/582.

AgE **WS-J487/WS-J587 Food Process Engineering** (3 cr). WSU Ag E 487/587.

AgE **491 Seminar** (1 cr). Professional aspects of the field, employment opportunities and preparation of occupational inventories. Graded P/F. Prereq: sr standing.

AgE **WS-J496/WS-J596 Conservation Engineering** (3 cr). WSU Ag E 496/596.

AgE **499** (s) **Directed Study** (cr arr). Prereq: perm.

AgE **500 Master's Research and Thesis** (cr arr).

AgE **501** (s) **Seminar** (cr arr). Graded P/F. Prereq: perm.

AgE **502** (s) **Directed Study** (cr arr). Prereq: perm.

AgE **506** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

AgE **ID&WS541 Instrumentation and Measurements** (3 cr). See AgE J441/J541.

AgE **ID551 Advanced Hydrology** (3 cr). WSU C E 518. Principles of the hydrologic cycle in mountainous areas, including precipitation, snowmelt, and systems simulation.

AgE **WS552 Advanced Theory of Irrigation Water Requirements** (3 cr). WSU Ag E 590. Alt/yrs.

AgE **WS553 Advanced Theory and Design of Irrigation Systems** (3 cr). WSU Ag E 592. Alt/yrs.

AgE **ID554 Drainage System Design** (2 cr). See AgE J454/J554.

AgE **ID555 Natural Channel Flow** (3 cr). WSU C E 555. Same as CE 529. Hydraulics of nonuniform flow in irregular channels, unsteady flow, and flow routing.

AgE **556 Irrigation System Design** (3 cr). See AgE J456/J556.

AgE **ID558 Fluid Mechanics of Porous Materials** (3 cr). WSU Ag E and C E 558. Statics and dynamics of multiflow systems in porous materials; properties of porous materials; steady and unsteady flow.

AgE **WS561 Advanced Agricultural Engineering Topics** (1-4 cr, max 6). WSU Ag E 551.

AgE **ID574 Fluid Power and Control Systems** (3 cr). See AgE J474/J574.

AgE **WS582 Microcomputer Controls in Agriculture** (3 cr). See AgE J482/J582.

AgE **WS587 Food Process Engineering** (3 cr). See AgE J487/J587.

AgE **589 Water Resources Seminar** (1 cr). See Inter 589.

AgE **WS593 Drainage Engineering** (3 cr). WSU Ag E 593.

AgE **WS596 Conservation Engineering** (3 cr). See AgE J496/J596.

AgE **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

AgE **600 Doctoral Research and Dissertation** (cr arr).

AGRICULTURAL MECHANIZATION

AgMech **ID107 Beginning Welding** (2 cr). WSU Ag M 107. Principles of operation, use, and care of arc and acetylene welding equipment. One lec, one 2-hr lab, and two hrs of individual practice a wk. Enrollment limited to 12 per section.

AgMech **ID112 Introduction to Agricultural Mechanization** (3 cr). WSU Ag M 112. Application of basic engineering principles to solving problems dealing with farm machinery, buildings, processing, irrigation, and energy use.

AgMech **115 Graphical Representation** (2 cr). Drafting procedures, lettering, orthographic projection, pictorial drawings, etching, graphs, and computer drafting. One lec and one 2-hr lab a wk.

AgMech **200** (s) **Seminar** (cr arr). Prereq: perm.

AgMech **201 Agricultural Building Construction** (2 cr). Farm building construction principles and practices including carpentry; concrete work and experience with tools and materials. Two 2-hr labs a wk; one 1-day nonscheduled class time.

AgMech **ID202 Agricultural Shop Practices** (2 cr). WSU Ag M 202. Primarily for agricultural mechanization and agricultural education students. Operation, use, and care of shop tools and equipment. One lec and one 3-hr lab a wk.

AgMech **204** (s) **Special Topics** (cr arr).

AgMech **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

AgMech **ID210 Small Engines** (2 cr). WSU Ag M 313. Principles of engine operation, tune-up, and maintenance; repair and overhaul of small engines. One lec, one 2-hr lab, and two hrs of individual practice a wk. Enrollment limited to 12 per section.

AgMech **WS211 Agricultural Machinery** (3 cr). WSU Ag M 211.

AgMech **240 Computer Applications in Agriculture** (3 cr). Application of computers in production agriculture; review of programming languages and operating systems; spread sheets, data base management, and other application programs. Prereq: 4 cr of college math and CS 100, or perm.

AgMech **304 Agricultural Hydraulics and Control** (1 cr). Fundamentals of hydraulic power and control as applied to agricultural machinery, tractors, and processing equipment. Two hrs of lec-lab a wk.

AgMech **ID305 Agricultural Machinery and Equipment** (3 cr). WSU Ag M 211. Application, management, adjustment, and care of farm equipment; machinery fabrication, power transmission, and hydraulic systems. Two lec and one 3-hr lab a wk.

AgMech **ID306 Agricultural Structures and Environmental Systems** (3 cr). WSU Ag M 306. Planning farm buildings, construction materials, beam and column design, insulation and ventilation for environmental control. Two lec and one 3-hr lab a wk.

AgMech **ID307 Metal Fabrication Processes** (2 cr). WSU Ag M 207. Principles of joining ferrous and nonferrous metals, MIG and TIG welding, and metal fabricating projects. One lec and one 2-hr lab a wk. Prereq: AgMech 107 and 202, or perm.

AgMech **ID&WS312 Electric Power Applications** (3 cr). WSU Ag M 331. Basic circuits; wiring and the code; motors and controls; heating, lighting, and power. Two lec and one 3-hr lab a wk.

AgMech **ID&WS315 Irrigation and Drainage** (2 cr). WSU Ag M 344. Irrigation methods, irrigation management, water rights, conveyance and measurement, pumps, soil-water-plant relationships, and drainage.

AgMech **ID&WS316 Irrigation and Drainage Lab** (1 cr). WSU Ag M 345. Irrigation system layout and design, irrigation scheduling, land grading, pump test, water measurement, and drainage design. Prereq or coreq: AgMech 315.

AgMech **WS346 Turf Irrigation Systems** (1 cr). WSU Ag M 364.

AgMech **389 Internship** (1-6 cr, max 6). Graded P/F. Prereq: perm of dept.

AgMech **400** (s) **Seminar** (cr arr). Prereq: perm.

AgMech **ID&WS405 Agricultural Processing** (3 cr). WSU Ag M 433. Grain cleaning, mixing, and drying; materials handling, heat transfer, pumps, fans, refrigeration, and instrumentation. Two lec and one 3-hr lab a wk; one 1-day field trip.

AgMech **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

AgMech **ID409 Agricultural Tractors and Power Units** (4 cr). WSU Ag M 312. Selection, operation, adjustment, service, and testing; fuels and combustion; fuel, lubrication, cooling, and electrical systems; tractor power trains, hitching, traction, and safety. Three 1-hr lec and one 3-hr lab a wk.

AgMech **414 Analysis of Agricultural Systems** (2 cr). Analysis of systems and equipment associated with agricultural production, handling, storage, and processing; system analysis techniques considering physical, social, and economic constraints; a project involving analysis of a system. One 1-day field trip. Prereq: AgMech 240 or equiv and sr standing.

AgMech **WS416 Mobile Hydraulics** (3 cr). WSU Ag M 416

AgMech **WS421 Agricultural Building Design** (3 cr). WSU Ag M 421.

AgMech **499** (s) **Directed Study** (cr arr). Prereq: perm.

Curricular Requirements

AGRICULTURAL ENGINEERING (B.S.Ag.E.)

Designed to prepare students for professional careers in agricultural engineering. The curriculum is administered under the College of Engineering and is accredited by the Engineering Accreditation Commission of the Accreditation Board of Engineering and Technology.

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
Courses common to engineering curricula (see part 4) (Chem 275-276 or 277-278 may be substituted for 114 and CS 112 may be substituted for 105)	38
AgE 142 Intro to Agricultural Engineering	2
AgE 242 Agricultural Engineering Analysis & Design	2
AgE 351 Hydrology	3
AgE 352 Soil & Water Engineering	3
AgE 372 Agricultural Power & Machines	3
AgE 441 Instrumentation & Measurements	3
AgE 449 Design of Agricultural Structures	3
AgE 456 Irrigation System Design	3
AgE 461 Agricultural Processing & Environment	3
AgE 462 Electric Power & Controls	3
AgE 478, 479 Agricultural Engineering Design I, II	3
AgE 491 Seminar	1
CE 211 Engineering Measurements	3
EE 207 Introduction to Electrical Engineering	3
ES 220 Engineering Dynamics	3
ES 320 Fluid Mechanics	3
ES 321 Thermodynamics & Heat Transfer	3

ES 340 Mechanics of Materials 3
Soils 205 General Soils 3
Stat 301 Probability & Statistics 3
Biological science electives 3
Communications electives 2
Humanities and social sciences electives, incl at least (1) one upper-div course or (2) a course that has another humanities/social sc course as a prereq 16
Technical electives (may incl upper-div biol sc and must incl at least two formal 400-level ag engr courses) 11
Undesignated electives 2

AGRICULTURAL MECHANIZATION (B.S.Ag.Mech.)

Designed to prepare students for careers in agriculture and agriculturally related businesses that require a knowledge of engineering methods. Emphasis is placed on the practical application of technology to agriculture. This curriculum is administered by the Department of Agricultural Engineering.

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
AgMech 112 Intro to Agricultural Mechanization	3
AgMech 115 Graphical Representation	2
AgMech 200 Seminar	1
AgMech 202 Agricultural Shop Practices	2
AgMech 240 Computer Applications in Agriculture	3
AgMech 304 Agricultural Hydraulics & Control	1
AgMech 305 Agricultural Machinery & Equipment	3
AgMech 306 Agricultural Structures & Environmental Systems	3
AgMech 312 Electric Power Applications	3
AgMech 315, 316 Irrigation & Drainage & Lab	3
AgMech 405 Agricultural Processing	3
AgMech 409 Agricultural Tractors & Power Units	4
AgMech 414 Analysis of Agricultural Systems	2
Acctg 201 Principles of Accounting	3
Acctg 202 Managerial Accounting	3
AgEc 278 Principles of Farm & Ranch Management	4
AgEc 391 Agribusiness Management	3
Biol 100 Introduction to Biology	4
BLaw 265 Legal Environment of Business	3
CE 218 Elementary Surveying	2
Chem 103 Intro to Chem or 111 Principles of Chem	4
CommG 131 Fundamentals of Public Speaking	2
Phys 101 Fundamentals of Physics	4
PlSc 102 Introduction to Plant Science	3
Soils 205, 206 General Soils & Lab	4
Advanced writing electives	3
Agricultural electives	12
Business electives	3
Humanities and social sciences electives (to incl Econ 152)	14
Life sciences electives	3
Math electives (approved by dept head)	7
Major field electives	5
Electives to total 132 cr for the degree	—

Academic Minor Requirements

AGRICULTURAL MECHANIZATION MINOR

Course	Credits
AgMech 202 Agricultural Shop Practices	2
At least four credits from the following skill courses:	
AgMech 107 Beginning Welding (2 cr)	
AgMech 115 Graphical Representation (2 cr)	
AgMech 201 Agricultural Building Construction (2 cr)	
AgMech 210 Small Engines (2 cr)	
At least ten credits from the following application courses:	
AgMech 304 Agricultural Hydraulics & Control (1 cr)	
AgMech 305 Agricultural Machinery & Equipment (3 cr)	
AgMech 306 Agricultural Structures & Environmental Systems (3 cr)	
AgMech 312 Electrical Power Application (3 cr)	
AgMech 315 Irrigation & Drainage (2 cr)	
AgMech 405 Agricultural Processing (3 cr)	
AgMech 409 Agricultural Tractors & Power Units (4 cr)	

The minimum number of credits in agricultural mechanization courses for the minor is 19.

Program in American Studies

Walter A. Hesford, Coordinator (121 Brink Hall). Faculty: Katherine G. Aiken, Roy A. Atwood, Anna Banks, David S. Barber, Richard W. Beeson, Donald W. Crowley, Jack L. Davis, Mary H. DuPree, Shaikh M. Ghazanfar, H. Lynne Haagensen, Sandra Haarsager, Peter A. Haggart, Walter A. Hesford, Eric L. Jensen, Harley E. Johansen, Alan Lifton, William R. Lund, Barbara R. Meldrum, Raymond L. Miller, Sheila O'Brien, Roderick Sprague, William R. Swagerty, Margrit von Braun, Diane B. Walker, Dennis D. West, Gary Williams. Affiliate Faculty: Bruce Wollenberg.

American Studies Courses

AmSt **404** (s) **Special Topics** (cr arr).

AmSt **499** (s) **Directed Study** (cr arr). Prereq: perm.

AmSt **301 Interpreting America** (4 cr). Satisfies core requirement J-3-d. Interdisciplinary approach to study of major aspects of American culture from its beginning to the present. Prereq: junior standing or perm.

Curricular Requirements

AMERICAN STUDIES (B.A.)

Required course work includes the university requirements (see regulation J-3), general requirements for the B.A. degree, and:

1. Ten credits in courses offered specifically for students in the American Studies program, including AmSt 301, Interpreting America (normally, one course each semester will be offered—see adviser); and

2. Completion of one of the following major areas of emphasis:

A. LITERATURE EMPHASIS

Course	Credits
Eng 343-344 Survey of American Literature	6
Two courses in English literature	6
Courses selected from the following list	15
Eng 427 American Fiction, 1914-1945	
Eng 439 Modern English & American Drama	
Eng 441 Intro to the Study of Language	
Eng 470 American Literature to 1830	
Eng 471 Poe, Hawthorne, & Melville	
Eng 472 Emerson, Thoreau & Whitman	
Eng 473 Literature of the American West	
Eng 474 American Literature, 1865-1914	
Eng 480 Ethnic & Minority Literature	
Eng 483 Black Literature	
Eng 484 American Indian Literature	
Courses in history and social science, incl at least 6 cr in each (selected from courses listed under the social sc emphasis and from upper-div courses listed under the history emphasis)	18

B. HISTORY EMPHASIS

Course	Credits
Hist 101-102 History of Civilization	6
Hist 111-112 Introduction to U.S. History	6
Five courses selected from the following list	15
Art 302 History of Art	
CommG 384 History of American Film	
Hist 411 American Colonial History to 1763	
Hist 412 The American Revolution, 1763-1789	
Hist 413 U.S.: Early National Period	
Hist 415 Civil War & Reconstruction, 1828-1877	
Hist 417 United States, 1900-1941	
Hist 418 Recent America	
Hist 420 History of Women in American Society	
Hist 423 Idaho & the Pacific Northwest	
Hist 428 History of the American West	
Hist 431 History of Indian-White Relations	
Hist 433-434 Social & Cultural History of the U.S.	
MusH 440 Studies in American Music	
Courses in literature and social science, incl at least 6 cr in each (selected from courses listed under the social sc emphasis and the following lit courses)	18
Eng 343-344 Survey of American Literature	
Eng 427 American Fiction, 1914-1945	
Eng 470 American Literature to 1830	
Eng 471 Poe, Hawthorne, & Melville	
Eng 472 Emerson, Thoreau, & Whitman	
Eng 473 Literature of the American West	
Eng 474 American Literature, 1865-1914	
Eng 483 Black Literature	
Eng 484 American Indian Literature	

C. SOCIAL SCIENCE EMPHASIS

Course	Credits
Anthr 329 North American Indians or Anthr 325 Indians of Idaho	3
Econ 151, 152 Principles of Economics or 272 Foundations of Economic Analysis and 435 American Economic Development	6-7
Geog 362 United States & Canada	3
PolSc 435 or Soc 410 Research Methods	3
Soc 230 Social Problems	3
Soc 322 Racial & Ethnic Relations	3
Soc 414 Modern Social Theory	3
Courses selected from the following list	14
Anthr 100 Introduction to Anthropology	
Arch 483 Introduction to City Planning	
Arch 484 City Planning	
Arch 499 Directed Study: American Architecture	
CommG 384 History of American Film	
CommG 386 American Documentary Film/Television	

Comm 140 Mass Media & Society
Comm 444 Communication & Public Opinion
Comm 445 History of Mass Communication
Econ 410 State & Local Government Finance
Econ 441 Labor Economics
Geog 165 Human Geography
Geog 330 Urban Geography
Geog 360 Population Dynamics & Distribution
Geog 364 Idaho & Pacific Northwest
MusH 440 Studies in American Music
Phil 411 Social Philosophy
PolSc 275 American State & Local Government
PolSc 431 American Political Parties & Elections
PolSc 432 American Congress
PolSc 433 American Political Culture
PolSc 438 Conduct of American Foreign Policy
PolSc 467 Constitutional Law
Soc 220 Marriage & the Family
Soc 310 Rural Sociology
Soc 313 Collective Behavior

Four courses in literature and history, incl at least 3 cr in each (selected from the following list) 12
Eng 343-344 Survey of American Literature
Eng 427 American Fiction, 1914-1945
Eng 470 American Literature to 1830
Eng 471 Poe, Hawthorne, & Melville
Eng 472 Emerson, Thoreau, & Whitman
Eng 473 Literature of the American West
Eng 474 American Literature, 1865-1914
Eng 483 Black Literature
Eng 484 American Indian Literature
Hist 417 United States, 1900-1941
Hist 418 Recent America
Hist 433-434 Social & Cultural History of the U.S.

Academic Minor Requirements

AMERICAN STUDIES MINOR

Course	Credits
AmSt 301 Interpreting America	4
Six courses numbered 300 or above, chosen from the emphasis lists under the American Studies major	18

Note: No course used toward an American Studies minor may also be used toward any major.

Department of Animal and Veterinary Science

Al J. Lingg, Acting, Dept. Head (213 Ag. Sc. Bldg.).

Animal Science Faculty: Mark V. Boggess, Ernest L. Brannon, Richard C. Bull, James E. Butler, Edward P. Duren, Dean E. Falk, Dennis G. Falk, Edward A. Fiez, Dan D. Hinman, Carl W. Hunt, Thomas B. McFadden, John C. Miller, Richard J. Norell, Ronald P. Richard, Richard A. Roeder, R. Garth Sasser, Gerald T. Schelling.

Veterinary Science Faculty: Bruce C. Anderson, Marie S. Bulgin, Jerry H. Exon, V. Michael Lane, Stuart D. Lincoln, Gary G. Mather, Greg Moller, David P. Olson, Elizabeth H. South, Alton C. S. Ward, Gordon L. Woods, Jerry Zaugg. Affiliate Faculty: William P. Cheevers, Victor P. Eroschenko, Norman L. Gates, John Gorham, Robert C. Ritter, Sue W. Ritter, David Stiller.

Animal agriculture has a major role in the supply of high quality food, not only for the people of the United States, but also for those of other nations. Food and fiber obtained from animals include meats, milk, eggs, wool, and many byproducts. Knowledge and skills resulting from a college education in this field will permit the graduate to contribute to improved production and health of the nation's livestock including beef, sheep, dairy, swine, poultry, horses, and companion animals.

In addition to classrooms and laboratories located in the Agricultural Science Building, the department's facilities include centers for dairy, beef, and sheep, as well as a meats laboratory and livestock judging pavilion. Several breeds are maintained for instructional and research purposes. The academic program is designed to prepare students for a variety of important and rewarding career opportunities. For more specific information, get in touch with the department head (208/885-6345).

The B.S. curricula offer four programs designed to prepare students for professional careers in animal agriculture. The agribusiness major with its dual emphasis on animal science and business is designed for students who want to enter management positions in livestock-related industries. The animal science major prepares students to pursue a career in livestock production, for graduate study in any of the varied disciplines in animal science, or for employment that requires intensive training in animal biology. The major in range-livestock management provides training in animal science with a sound background in the relationship between animals and plants and is intended for students interested in the management of range and pasture related to beef cattle or sheep operations. The fourth option is a poultry production program offered in cooperation with Oregon State University.

Under the major in animal science, graduate study leading to an M.S. degree is offered in animal breeding and genetics, nutrition, physiology, endocrinology, and meat science. Prospective students should have an undergraduate degree (B.S.) in animal, dairy, or poultry science, or a closely related field. For more detailed information, see the Graduate Bulletin.

A pre-veterinary medical education program is offered by the Department of Veterinary Science for those students preparing for admission to a college of veterinary medicine. Students with majors other than veterinary science may participate and receive counseling. If, after successful completion of 99 credits, a student majoring in veterinary science is admitted to a recognized college of veterinary medicine, the successful completion of the first year of study at the college of veterinary medicine (at least 33 credits in approved courses) will constitute the senior year toward the degree of B.S.Vet.Sc. at UI. Students under this option must complete their junior year (at least 33 credits) in residence on the Moscow campus.

Support courses in biological sciences, animal disease, reproduction and health, and electron microscopy are offered to students in other departments of the university.

The Department of Animal and Veterinary Science and the Washington, Oregon, Idaho (WOI) Regional Program in Veterinary Medical Education, University of Idaho, offers a program of graduate study leading to an M.S. degree at the UI or the Ph.D. degree at Washington State University. Prospective students for the M.S. degree in veterinary science should have the D.V.M. degree or have completed the requirements for a B.S. degree in biology, bacteriology, animal science, or other biological science. For more detailed information, see the Graduate Bulletin.

Courses

ANIMAL SCIENCE

AnSc **109 The Science of Animals that Serve Mankind** (3 cr). Role of animal agriculture in providing food, work, and pleasure for mankind; intro to animal genetics, physiology, endocrinology, nutrition, and other disciplines essential for an understanding of the contributions of animals in the expanding human population. Coreq for majors in the Animal Sc Dept: AnSc 110.

AnSc **110 Animal Science Lab** (1 cr). Lab exercises demonstrating the importance of domestic animals to human welfare. One 2-hr lab a wk. Coreq: AnSc 109.

AnSc **152 Livestock Management Practices** (2-3 cr). Management practices in the production, exhibition, and marketing of livestock and poultry. Two or three 2-hr labs a wk; one 1/2-day field trip. Graded P/F.

AnSc **WS176 Sheep Management Lab** (1 cr). WSU A S 176.

AnSc **203 Live and Carcass Evaluation** (3 cr). Evaluation and selection of cattle, sheep, and swine for herd replacements; evaluation of market animals; carcass evaluation and grading, and factors that affect quality and quantity of meat; visual and objective appraisals. One lec and two 3-hr labs a wk; four 1-day and four 1/2-day field trips or equiv time.

AnSc **205 Introduction to Animal Nutrition** (3 cr). May not be used for major cr by majors in animal science or range-livestock management. Functions, metabolism, and requirements of nutrients with applications to the diets of animals and birds.

AnSc **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

AnSc **WS212 Dairy Cattle Traits** (2 cr). WSU A S 272.

AnSc **222 Animal Reproduction and Breeding** (3 cr). May not be used for major cr by majors in animal science or range-livestock management. Application of principles of genetics and reproductive physiology in domestic animal improvement, fertility, systems of mating, and selection of techniques.

AnSc **263 Introduction to Meat Science** (3 cr). Duplicate cr not allowed in AnSc 263 and 264. The meat industry, sanitation, slaughtering, processing, and factors that affect the quality and palatability of meat. Two lec and one 3-hr lab a wk.

AnSc **264 Consumer Meats** (3 cr). Duplicate cr not allowed in AnSc 263 and 264. Meat as a food; meat inspection, pricing, selection, processing, storage, and cookery. Two lec and one 3-hr lab a wk.

AnSc **265 Abattoir Skills** (1 cr). Practical experience in meat animal slaughter. Prereq: AnSc 263 or 264.

AnSc **299** (s) **Directed Study** (cr arr). Graded P/F. Prereq: perm of dept.

AnSc **304 Advanced Animal Evaluation** (3 cr). Emphasis on use of records in selection and use of carcass value in pricing live market animals; factors that affect the economic value of meat animals. Students participate in live animal-carcass evaluation contests. One lec and two 3-hr labs a wk; four 1-day and four 1/2-day field trips in addition to contests or equiv time. Prereq: AnSc 203.

AnSc **305 Animal Nutrition** (3 cr). Proteins, carbohydrates, fats, minerals, and vitamins; physiology of digestion, absorption and metabolism of nutrients, and the relationship of enzymes and hormones in these phenomena. Prereq: Biochem 380.

AnSc **306 Feeds and Ration Formulation** (4 cr). Application of principles of nutrition to ration formulation for poultry and livestock; evaluating feedstuffs for use in ration formulation. Three lec and one 2-hr lab a wk. Prereq: AnSc 205 or 305.

AnSc **320 Animal Breeding** (3 cr). Same as Genet 320. Application of genetic principles to the improvement of farm animals, effects of inbreeding, outbreeding, assortative, and disassortative mating on animal populations, selection for economically important traits; heritability; genetic correlations; use of selection indexes. Prereq: Genet 314 and Stat 251.

AnSc **321 Beef Cattle Science** (3 cr). Breeding, feeding, and management; commercial and purebred enterprises; management of beef cattle on ranges, pasture, and in the feedlot. One 1-day field trip. Prereq: AnSc 205 and 222 or equiv.

AnSc **ID&WS322 Sheep Science** (3 cr). WSU A S 476. Application of principles of genetics, reproduction, nutrition, health, and marketing to the management of commercial and purebred sheep; new developments related to sheep industry; production, evaluation, and use of wool. Two lec and one 2-hr lab a wk; one 1-day field trip or equiv time. Prereq: AnSc 205 and 222 or equiv.

AnSc **ID&WS323 Dairy Cattle Management** (4 cr). WSU A S 472. Establishing a dairy farm, housing and managing large dairy herds, selection of breeding cattle, and marketing quality milk. One 4-day field trip. Prereq: AnSc 205 and 222 or equiv.

AnSc **ID&WS326 Swine Science** (3 cr). WSU A S 478. Principles of breeding, feeding, management, and marketing of swine. Two 2-hr lec-labs a wk; two 1-day field trips or equiv time. Prereq: AnSc 205 and 222 or equiv.

AnSc **WS388 Horse Production** (3 cr). WSU A S 466.

AnSc **389 Internship** (1-6 cr, max 6). Graded P/F. Prereq: perm of dept.

AnSc **403** (s) **Workshop** (cr arr). Normally offered in nutrition, breeding, products, and management. Graded P/F. Prereq: perm.

AnSc **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

AnSc **410 Production and Processing Practices** (1 cr, max 2). Livestock, dairy, and poultry production; processing practices and facilities. One 7-day field trip or equiv time. Graded P/F.

AnSc **ID&WS413 Physiology of Lactation** (3 cr). WSU A S 452. Alt/yrs. Anatomy, physiology, and endocrine control of mammary dev and milk secretory process. Prereq: Biol 202 (VS 371 recommended) or perm.

AnSc **ID&WS-J415/ID&WS-J515 Lab Methodology** (2 cr). WSU A S 415. Research methodology used in experimental nutrition and physiology. Additional projects/assignments reqd for grad cr. One lec and two 2-hr labs a wk. Prereq for AnSc 515: grad status and perm.

AnSc **421 Population Genetics** (3 cr). Same as Genet 421. Gene frequency analysis; effects of natural and artificial selection on the genetic composition of populations; inheritance of quantitative characters; concepts of heritability; effects of inbreeding and outbreeding on populations. Prereq: Genet 314 and Stat 251.

AnSc **J430/J530 Advanced Topics in Embryo Physiology** (3 cr). Alt/yrs. Analysis of biochemical, endocrine, and anatomical events of embryonic development with emphasis on lab and domestic animals; critical analysis of current scientific literature; lab techniques in developmental biology. Outside reading, class presentation, and term paper reqd; additional projects/assignments reqd for grad cr. Two lec and one lab a wk.

AnSc **450 Proseminar** (1 cr, max 2). Special topics in animal science.

AnSc **J451/J551 Endocrine Physiology** (3 cr). Same as Zool J417/J517. Structure and physiology of glands of internal secretion and their hormonal effects on processes of growth, dev, metabolism, and production of vertebrates; minor emphasis on invertebrates. Cr earned in AnSc 551 by completion of term paper. Prereq: Biol 202 and Biochem 380.

AnSc **452 Physiology of Reproduction** (4 cr). Physiology of reproduction; growth, structure, development, endocrinology, and control of reproductive function with emphasis on farm animals. Three lec and one 2-hr lab a wk. Prereq: Biol 202.

AnSc **454 Artificial Insemination and Pregnancy Detection** (2 cr). Anatomy and physiology of pregnant and nonpregnant reproductive systems; artificial insemination; male reproduction; pregnancy detection in domestic livestock. Two 2-hr lec-labs a wk. Enrollment limited to 20 students. Preregistration required; consult dept administrator. Prereq: AnSc 222 or Zool 411 (may be concurrent) and perm.

AnSc **ID&WS472 Meat Science** (3 cr). WSU A S 360. Alt/yrs. Growth and development of meat animals; factors affecting quantity and quality of meat. Prereq: AnSc 263 and biochemical.

AnSc **499** (s) **Directed Study** (cr arr). Graded P/F. Prereq: perm of dept.

AnSc **500 Master's Research and Thesis** (cr arr). Graded P/F.

AnSc **501** (s) **Seminar** (cr arr). Prereq: perm.

AnSc **502** (s) **Directed Study** (cr arr). Graded P/F. Prereq: perm.

AnSc **503** (s) **Workshop** (cr arr). Prereq: perm.

AnSc **504** (s) **Special Topics** (cr arr).

AnSc **506** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

AnSc **511 Protein and Energy Nutrition** (3 cr). Current concepts in protein and energy metabolism and function relating to nutrients reqd for maintenance, growth, and development of animals. Prereq: AnSc 305, Biochem 380 or equiv.

AnSc **WS512 Nutrient Metabolism** (5 cr). WSU A S 507. Alt/yrs.

AnSc **513 Microbiology and Physiology of Ruminant Nutrition** (3 cr). Alt/yrs. Physiology and microbiology aspects of ruminant digestion and their influence on the metabolism of extraruminal tissues; interpretation of nutritive requirements in terms of rumen microbiology activities; evaluation of research techniques. Prereq: perm.

AnSc **514 Physiology of Nonruminant Nutrition** (3 cr). Alt/yrs. Physiology of digestion, absorption, and metabolism of nutrients in monogastric animals and birds; biological evaluation of nutrients and nutritional interrelationships. Prereq: perm.

AnSc **ID&WS515 Lab Methodology** (2 cr). See AnSc J415/J515.

AnSc **ID&WS520 Seminar in Animal Physiology** (1 cr, max arr). WSU A S 540. Current topics in animal physiology.

AnSc **522 Statistical Genetics** (3 cr). Same as Stat and Genet 522. Statistical techniques used in population genetics research; methods of estimating heritability, genetic correlations, and phenotypic correlation, construction of selection indexes; mating systems; genetic homeostasis. Prereq: perm.

AnSc **WS526 Advanced Reproduction** (4 cr). WSU A S 550. Alt/yrs.

AnSc **530 Advanced Topics in Embryo Physiology** (3 cr). See AnSc J430/J530.

AnSc **WS538 Neuroendocrinology** (3 cr). WSU V Ph 538.

AnSc **551 Endocrine Physiology** (3 cr). See AnSc J451/J551.

AnSc **552 Adv Endocrine Physiology** (3 cr). Biochemical and physiological properties of hormones; lab techniques in experimental endocrinology. Two lec and one 2-hr lab a wk. Prereq: AnSc J451/J551, Chem J482/J542.

AnSc **ID&WS560 Domestic Animal Growth and Development** (3 cr). WSU A S 560. Development, differentiation, growth, and endocrine regulation of major organ systems in domestic animals. Prereq: AnSc 511, Biochem 380, and perm.

AnSc **WS596 Advanced Topics in Animal Science** (1-2 cr, max arr). WSU A S 598.

AnSc **597** (s) **Practicum** (cr arr). Prereq: perm.

AnSc **598** (s) **Internship** (cr arr). Prereq: perm.

AnSc **600 Doctoral Research and Dissertation** (cr arr).

VETERINARY SCIENCE

Courses in this subject field that have a WS prefix are open only to students who have veterinary science graduate student status or by permission of the director of the Idaho faculty of the WOI Regional Program in Veterinary Medical Education.

VS **200** (s) **Seminar** (cr arr). Prereq: perm.

VS **203** (s) **Workshop** (cr arr). Prereq: perm.

VS **204** (s) **Special Topics** (cr arr).

VS **205 Veterinary Medical Orientation** (2 cr). Prereq: perm.

VS **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

VS **299** (s) **Directed Study** (cr arr). Prereq: perm.

VS **371 Anatomy and Physiology** (4 cr). Structure and function of tissues and organ systems of domestic and wild animals. Three lec and one 2-hr lab a wk.

VS **389 Internship** (1-6 cr, max 6). Graded P/F. Prereq: perm of dept.

VS **400** (s) **Seminar** (cr arr). Prereq: perm.

VS **WS401 Gross Anatomy** (5 cr). WSU V M 401. Grad cr not granted to those who have DVM degree.

VS **WS402 Veterinary Anatomy** (2 cr). WSU V M 402. Grad cr not granted to those who have DVM degree.

VS **404** (s) **Special Topics** (cr arr).

VS **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

VS **WS-J408/WS-J508** (s) **WOI Topics** (cr arr). Used for WSU courses that have not been cross-listed. Consult the Time Schedule for courses offered.

VS **WS413 Advanced Anatomy** (3 cr, max 6). WSU V An 413.

VS **J427/J527 Transmission Electron Microscopy** (3 cr). Discussion and application of basic skills reqd in use of transmission electron microscope, including simple specimen

preparation techniques and photographic darkroom skills. Additional projects/assignments reqd for grad cr.

VS **WS430 Veterinary Immunology** (3 cr). WSU V M 430.

VS **WS431 Veterinary Virology** (3 cr). WSU V M 431.

VS **WS432 Veterinary Bacteriology** (4 cr). WSU V M 432.

VS **WS435 Disease Concepts for Wildlife Biologists** (3 cr). WSU V Mic 435. Note: Students on the Idaho campus who need this course enroll in VS 446A.

VS **WS436 Disease of Commercial Fowl** (3 cr). WSU V M 436. One lec and two 3-hr labs a wk.

VS **J440/J540 Biological Electron Microscopy** (4 cr). Application of biological specimen preparation techniques in EM, including ultramicrotomy and use of specific stains. Registration for VS 540 requires completion of a written report. Prereq: VS J427/J527.

VS **J441A/J541 Scanning Electron Microscopy** (3 cr). Theory and principles of scanning electron microscopy as investigative tool; includes operation and maintenance of electron microscope, specimen preparation, and photographic darkroom procedure. Students registering for VS 541 are reqd to complete an additional research paper.

VS **WS441B Pharmacological Basis of Therapeutics I** (3 cr). WSU PharS 441.

VS **WS442 Pharmacological Basis of Therapeutics II** (3 cr). WSU PharS 442.

VS **WS443 Pharmacological Basis of Therapeutics III** (4 cr). WSU PharS 443.

VS **WS444A Small Animal Pathology** (3 cr). WSU V M 444.

VS **WS444B Pharmacological Basis of Therapeutics IV** (4 cr). WSU PharS 444.

VS **WS445 Pathology I** (3 cr). WSU V M 445.

VS **446A Diseases of Wild Birds and Mammals** (2 cr). See WLF 446.

VS **WS446B Pathology II** (6 cr). WSU V M 446.

VS **WS446C Pharmacological Basis of Therapeutics Lab** (1 cr). WSU PharS 446.

VS **WS449 Pathology of Large Animal Diseases** (3 cr). WSU V M 449.

VS **WS451 Veterinary Parasitology** (5 cr). WSU V M 451.

VS **452 Diseases and Care of Lab Animals** (3 cr). Alt/yrs. Vertebrate animal species commonly employed as lab animals; diseases, sanitation, environmental control, and general care. Two lec and one 2-hr lab a wk.

VS **WS454 Special Animal Medicine** (3 cr). WSU V M 454.

VS **473 Herd Health Management** (3 cr). Impact of immunity, sanitation, housing, chemotherapy, quarantine, and stress on livestock disease prevention. Prereq: AnSc 205 and/or 305 and jr standing.

VS **474 Animal Disease** (3 cr). Causes, transmission, susceptibility, symptoms, diagnosis, prevention, and control of major infectious diseases and parasites of domestic animals. Prereq: VS 371, Bact 250.

VS **481 Virology** (3 cr). See Bact 481.

VS **483 Virology Lab** (1 cr). Same as Bact 483. Familiarization with tissue culture techniques used in virology; infection of cultures with selected viruses; observation and evaluation of infected cultures by different diagnostic techniques. One 3-hr lab a wk. Prereq or coreq: VS 481.

VS **499** (s) **Directed Study** (cr arr). Prereq: perm.

VS **500 Master's Research and Thesis** (cr arr).

VS **501A** (s) **Seminar** (cr arr). Prereq: perm.

VS **WS501B Concepts of Pharmacology and Toxicology** (1 cr). WSU P/T 501.

VS **502** (s) **Directed Study** (cr arr). Prereq: perm.

VS **504** (s) **Special Topics** (cr arr).

VS **WS505 Principles of Toxicology** (3 cr). WSU P/T 505.

VS **WS506 Principles of Pharmacology I** (3 cr). WSU P/T 506.

VS **WS507 Principles of Pharmacology II** (3 cr). WSU P/T 507.

VS **WS508** (s) **WOI Topics** (cr arr). See VS J408/J508.

VS **WS510A Advanced Pharmacokinetics** (2 cr). WSU P/T 510. Alt/yrs.

VS **WS510B Advanced Food Chemistry** (3 cr). WSU FSHN 510. Alt/yrs.

VS **WS511A Applied Anatomy of Large Animals** (2 cr). WSU V M 511.

VS **WS511B Selected Topics in Toxicology** (1-4 cr). WSU P/T 511.

VS **ID512A Principles of Comparative Pathology** (4 cr). WSU P/T 543. Alt/yrs. Gross and micro pathology, histological techniques, neoplasia. Prereq: Zool 324, 427 or equivalent, or perm.

VS **WS512B Applied Anatomy of Small Animals** (2 cr). WSU V M 512.

VS **WS512C Selected Topics in Pharmacology** (1-4 cr). WSU P/T 512.

VS **WS513 Advanced Neuroanatomy** (3 cr). WSU V An 513. Alt/yrs.

VS **WS517 Mammalian Neuroscience** (3 cr). WSU V M 517.

VS **WS518 Veterinary Physiology** (5 cr). WSU V M 518.

VS **WS520 Techniques in Mammalian Physiology** (2 cr). WSU V Ph 520. Alt/yrs.

VS **WS521 Cardiorespiratory Systems** (3 cr). WSU V Ph 521. Alt/yrs.

VS **WS525 Instrumental Methods in Pharmacology/Toxicology** (3 cr). WSU P/T 525.

VS **527 Transmission Electron Microscopy** (3 cr). See VS J427/J527.

VS **WS529 Neurochemistry** (3 cr). WSU V Ph 529. Alt/yrs.

VS **WS531 Advanced Immunology and Immunogenetics** (3 cr). WSU V Mic 531. Alt/yrs.

VS **WS532A Metabolism of Drugs and Toxins** (2 cr). WSU P/T 532. Alt/yrs.

VS **WS532B Virology** (3 cr). WSU V Mic 532. Alt/yrs.

VS **WS533 Pharmacology and Toxicology II** (4 cr). WSU V M 533.

VS **WS535A Advanced Readings in Veterinary Microbiology** (1 cr, max arr). WSU V Mic 535.

VS **WS535B Pathophysiology of Blood** (3 cr). WSU V Ph 535. Alt/yrs.

VS **WS536 Diagnostic Microbiologic Conference** (1 cr, max arr). WSU V Mic 536.

VS **WS537A Diagnosis of Viral and Rickettsial Diseases of Domestic Animals** (3 cr). WSU V Mic 537.

VS **WS537B Physiology and Biochemistry of Neuropeptides** (3 cr). WSU P/T and V Ph 537.

VS **540 Biological Electron Microscopy** (4 cr). See VS J440/J540.

VS **541 Scanning Electron Microscopy** (3 cr). See VS J441A/J541.

VS **WS542A Advanced Diagnostic Pathology** (1-4 cr, max 8). WSU V Pa 542.

VS **WS542B Diseases of Wildlife** (2 cr). WSU V M 542.

VS **WS543 Lab Animal Pathology** (3 cr, max 6). WSU V Pa 543. Alt/yrs.

VS **WS544 Immunopathology** (3 cr). WSU V Pa 544. Alt/yrs.

VS **WS545A Mechanisms of Disease** (5 cr). WSU V Pa 545.

VS **WS545B Toxicology of Pesticides** (3 cr). WSU Entom 545. Alt/yrs.

VS **WS546 Advanced Readings in Veterinary Parasitology** (1 cr, max arr). WSU V Pa 546.

VS **WS548 Seminar in Experimental Pathology** (1 cr, max arr). WSU V Pa 548.

VS **WS557 Advanced Mammalian Physiology** (6 cr). WSU V Ph 557.

VS **WS560 Molecular Genetics** (3 cr). WSU Micro 560.

VS **WS561 Receptorology** (2 cr). WSU P/T 561. Alt/yrs.

VS **WS563 General Biochemistry** (3 cr). WSU BC/BP 563. Note: Students on the Idaho campus enroll in Biochem J481/J541 or Chem J481/J541.

VS **WS564 General Biochemistry** (3 cr). WSU BC/BP 564. Note: Students on the Idaho campus enroll in Biochem J482/J542 or Chem J482/J542.

VS **WS565 Teratogenesis, Mutagenesis, and Carcinogenesis** (2 cr). WSU P/T 565. Alt/yrs.

VS **WS566 Target Organ Toxicity** (2 cr). WSU P/T 566. Alt/yrs.

VS **WS567 Risk Assessment Methodologies** (2 cr). WSU P/T 567. Alt/yrs.

VS **WS570 Advanced Immunology** (3 cr). WSU Micro 570.

VS **WS587 Hospital Rotation** (3 cr, max 6). WSU V MS 587.

VS **WS592** (s) **Seminar** (1 cr, max arr). V An, V Mic, V MS, V Pa, V Ph 592.

VS **WS597 Pharmacology and Toxicology Seminar** (1 cr, max 4). WSU P/T 597. Graded P/F.

VS **598** (s) **Internship** (cr arr). Prereq: perm.

Curricular Requirements

Animal Science

Three programs are designed to prepare students for professional careers in animal agriculture. The agribusiness major with its dual emphasis on animal science and business is designed for students who want to enter management positions in livestock-related industries. The animal science major prepares students to pursue a career in livestock production, for graduate study in any of the varied disciplines in animal science, or for employment that requires intensive training in animal biology. The major in range-livestock management provides training in animal science with a sound background in the relationship between animals and plants and is intended for students interested in the management or operation of range and pasture beef cattle or sheep operations.

CORE COURSES FOR B.S.An.Sc.

Course	Credits
AnSc 109 The Science of Animals that Serve Mankind	3
AnSc 222 Animal Reproduction & Breeding	3
AnSc 263 Introduction to Meat Science	3
AnSc 305 Animal Nutrition	3
AnSc 306 Feeds & Ration Formulation	4
AnSc 320 Animal Breeding	3
AnSc 450 Proseminar	1
Two of the following courses	6-7
AnSc 321 Beef Cattle Science	
AnSc 322 Sheep Science	

AnSc 323 Dairy Cattle Management
AnSc 326 Swine Science
AnSc 388 Horse Production
Biol 201 Intro to the Life Sciences 4
Chem 111 Principles of Chemistry 4
Chem 275 Carbon Compounds 3
CommG 131 Fundamentals of Public Speaking 2
Stat 251 Principles of Statistics 3
Computer science electives 2-3

AGRIBUSINESS (B.S.An.Sc.)

Required course work includes the university requirements (see regulation J-3), the animal science core, and:

Course	Credits
Acctg 201 Principles of Accounting	3
Acctg 202 Managerial Accounting	3
AgEc 278 Principles of Farm & Ranch Management	4
AgEc 289 Agricultural Markets & Prices	3
AgEc 391 Agribusiness Mgt or Bus 311 Intro to Mgt	3
Econ 151, 152 Principles of Economics	6
Eng 313 Business Writing	3
Math 140 Pre-calculus Algebra & Analytic Geometry	3
Agricultural economics or accounting electives	6
Business electives	9
Electives to total 132 cr for the degree	—

ANIMAL SCIENCE (B.S.An.Sc.)

Required course work includes the university requirements (see regulation J-3), the animal science core, and:

Course	Credits
AnSc 452 Physiology of Reproduction or 451 Endocrine Physiology	3-4
Biochem 380, 382 Introductory Biochem & Lab	4
Biol 202 General Zoology	4
Chem 276 Carbon Compounds Lab	1
Eng 317 Technical & Engineering Report Writing	3
Genet 314 General Genetics	3
Math 160 Survey of Calculus	4
VS 371 Anatomy & Physiology	4
Life science electives	4
Electives to total 132 cr for the degree	—

POULTRY SCIENCE (B.S.An.Sc.)

This program is offered in cooperation with Oregon State University. Idaho resident students will not be charged out-of-state tuition by OSU. Two options are listed below. If a student is interested in obtaining additional instruction in poultry science but wants a degree in animal science from UI, option A should be chosen. If a student wants a degree in poultry science from OSU, option B should be chosen.

OPTION A—B.S.An.Sc.

Required course work includes the university requirements (see regulation J-3) and:

First and Second Years	Credits
AnSc 263 Introduction to Meat Science	3
Biol 201 Introduction to the Life Sciences	4
Biol 202 General Zoology	4
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
Chem 277, 278 Organic Chemistry I & Lab	4
CommG 131 Fundamentals of Public Speaking	2
Genet 314 General Genetics	3
Math electives	8
Humanities and social sciences electives	9
Electives	6

Third Year—45 quarter credits taken at OSU, chosen from a list of courses available from the Department of Animal and Veterinary Sciences.

Fourth Year	Credits
AnSc 305 Animal Nutrition	3
AnSc 450 Proseminar	1
AnSc 451 Endocrine Physiology or 452 Physiology of Reproduction	3-4
Eng 313 Business Writing or 317 Tech & Engr Report Writing	3
Stat 251 Principles of Statistics	3
Humanities and social sciences electives	6
Electives	14

OPTION B—B.S. in Poultry Science from OSU

First and Second Years	Credits
All courses listed under first and second years in option A (taken at UI)	60

Third and Fourth Years—90 quarter credits taken at OSU, chosen from a list of courses available from the Departments of Poultry and Animal Sciences.

RANGE-LIVESTOCK MANAGEMENT (B.S.An.Sc.)

Required course work includes the university requirements (see regulation J-3), the animal science core, and:

Course	Credits
AnSc 203 Live & Carcass Evaluation	3
AnSc 452 Physiology of Reproduction	4
Biochem 380 Introductory Biochemistry	3
Biol 202 General Zoology	4
Biol 203 General Botany	4
Bot 241 Systematic Botany	3
Chem 276 Carbon Compounds Lab	1
Eng 317 Technical & Engineering Report Writing	3
Genet 314 General Genetics	3
Math 160 Survey of Calculus	4
PlSc 308 Forage Crops	3
Range 351 Elements of Range Management	3
Range 452 Range Communities	4
Range 453 Rangeland Vegetation Inventory & Analysis	3
Soils 205, 206 General Soils & Lab	4
Electives to total 132 cr for the degree	—

VETERINARY SCIENCE (B.S.Vet.Sc.)

Students in the College of Agriculture who successfully complete a minimum of 99 credits with a major in animal science, bacteriology, or veterinary science, who complete all major requirements in the specified major, and who are admitted to a recognized college of veterinary medicine will, upon successful completion of the first year at the college of veterinary medicine (at least 33 credits), be awarded the appropriate UI baccalaureate degree (B.S.An.Sc., B.S.Bact., or B.S.Vet.Sc.). Students who choose this option must be enrolled for their junior year (at least 33 credits) in the major in which they will receive their degree.

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
VS 205 Veterinary Medical Orientation	2
Biochem 380, 382 Introductory Biochemistry & Lab	4
Biol 201 Introduction to the Life Sciences	4
Biol 202 General Zoology	4
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
Chem 277, 278 Organic Chemistry I & Lab	4
Math 111 Finite Math or 140 Pre-calculus Algebra & Analytic Geometry or 180 Analytic Geometry & Calculus I	3-4
Phys 113-114 General Physics	6
Advanced writing electives	3
Agricultural electives	18-20
Approved electives (1st year of vet medicine)	33
Humanities and social sciences electives (minimum 6 cr in each area)	14
Speech electives	2
Electives to total 132 cr for the degree	—

ANTHROPOLOGY—see Department of Sociology and Anthropology

Department of Architecture

Robert M. Baron, Acting Dept. Chair (207 Art and Arch. South). Faculty: Robert M. Baron, Ronald D. Bevans, Cynthia D. Blue-Blanton, William B. Bowler, Jr., Kenneth D. Carper, Bruce T. Haglund, Wendy R. McClure, William B. McCroskey, M. Joe Numbers, John L. Pulliam, Gifford Pierce, D. Nels Reese, Brian F. Sumption.

The Department of Architecture offers two undergraduate options that contain the fundamentals for the design of the human environment. Linked together by a common core experience in design and allied fields, these options allow the undergraduate to pursue specialized programs leading to either the five-year degree of Bachelor of Architecture (B.Arch.) or the four-year degree of Bachelor of Fine Arts in interior planning and design (B.F.A.). Both are professional programs that combine a specialized core curriculum with a breadth of opportunities in electives and general education.

In the department, the studio method of learning emphasizes the development of individual creativity and technical competence in the student's chosen field of concentration. The department's objective is the achievement of a sense of involvement, integrity, and social responsibility by the student. Architects and interior designers are dedicated to the creation of a more effective and responsive human environment.

The facilities of the Department of Architecture are housed in four buildings totaling over 35,000 square feet of usable space. Specialized laboratories for white printing, photo processing, printmaking, and graphics are contained within the facilities. A reference and slide library as well as a complete shop are housed within the com-

plex. The college facilities also include a fully equipped computer laboratory.

Students who are interested in continuing their education at the graduate level in architecture will find two programs available. The Master of Arts in architecture is a program that provides an opportunity for persons with nonarchitectural undergraduate backgrounds to prepare themselves for participation in the team approach to the solution of environmental problems, involving an individualized program of study and a written thesis. The Master of Architecture is a professional degree program in architecture in which the thesis is a comprehensive architecturally oriented project or projects in written and visual form. Admission to this latter program requires the five-year professional B.Arch. degree.

Students interested in careers in construction business and wood products may wish to consider the wood construction and design option in the Department of Forest Products.

Courses

Note: On registering for a studio course offered in this department, the student agrees that the department may retain work completed by the student. The department will make retained work available to the student for photographing.

ARCHITECTURE

Arch **155 Introduction to Architecture** (2 cr). Slide lec course introducing architecture and interior architecture; methods of critical analysis; history of modern movement to contemporary design.

Arch **156 Graphic Communication** (2 cr). Intro to the process of graphic communication; studio projects to explore graphics through projects, lec, and readings. Two 2-hr studios a wk and assigned work.

Arch **200** (s) **Seminar** (cr arr). Prereq: perm.

Arch **203** (s) **Workshop** (cr arr). Prereq: perm.

Arch **204** (s) **Special Topics** (cr arr).

Arch **255 Advanced Architectural Graphics** (2 cr). Two- and three-dimensional drawing applying various delineation techniques; preliminary presentation techniques and use of color in graphics. Two 2-hr studios a wk and assigned work. Prereq: Arch 156 or perm.

Arch **256 Basic Architectural Design** (3 cr). Intro to design process, space and space relationships, character of design, and form; development of sketch presentation techniques. Two 3-hr studios a wk and assigned work.

Arch **266 Materials and Methods** (3 cr). Materials characteristics from manufacture to construction; production information and resource literature investigation.

Arch **299** (s) **Directed Study** (cr arr). Prereq: perm.

Arch **353-354 Architectural Design I** (5 cr). Expansion of student vocabulary of architectural forms and their means of generation; a broad scope and nonrestrictive (though directed) class covering aspects of form generation from human to climatic conservations, influences of history, research, and materials of construction related to architectural design; encouragement of student experimentation and creativity. Three 3-hr studios a wk and assigned work; field trips will be reqd at student expense; some class jury sessions will meet outside of scheduled hours. Prereq: Arch 256, 266.

Arch **365-366 Building Technology I** (3 cr). Arch 365: basic structural design including elementary statics and principles and technology of wood structural design. Arch 366: principles and technology of structural reinforced concrete building design problems by integrating solutions with Architectural Design studio. Prereq: Phys 113, Math 140, Arch 365 for 366, or perm.

Arch **374 Computer Applications in Architecture** (3 cr). Principles of current computer technologies in architecture and interior design; emphasis on development of tool using skills applied in preliminary design, design development, and presentation phases of design process.

Arch **383 Architectural Site Design** (3 cr). Fundamentals of site analysis, site design, and site planning for architects; principles and theories in technical, functional, social, legal, and perceptual issues related to the building site. Non-credit lab section for discussion and presentation of additional technical issues and site-related design projects; field trips and special sessions may be reqd.

Arch **384 Computer-Aided Design** (2 cr). Applications of computer-aided design concepts and methods in architecture and interior design; emphasis on development of tool using skills applied in design development and production phases of the design process. Prereq: Arch 374 or perm.

Arch **385-386 History of Architecture** (3 cr). Arch 385: Ancient, Classical, and Medieval worlds. Arch 386: Renaissance through the modern world.

Arch **400** (s) **Seminar** (cr arr). Prereq: perm.

Arch **403** (s) **Workshop** (cr arr). Prereq: perm.

Arch **404** (s) **Special Topics** (cr arr).

Arch **453-454 Architectural Design II** (5 cr). Study directed at specifics of building design synthesizing related course work into a comprehensive problem solution from multiple-building planning to working drawings on a single building. Three 3-hr studios a wk and assigned work; field trips will be reqd at student expense; some class jury sessions will meet outside of scheduled hours. Prereq: Arch 353-354.

Arch **455-456 Architectural Design III** (5 cr). Expansion to the urban scale of the student's design awareness and ability; to acquaint the student with the multiplicity of considerations involved as project scope increases beyond a single site; to encourage creative and broad-scope thought and action on the future configuration of our cities. In Arch 456, the student undertakes a self-directed arch design study with faculty consultation. Three 3-hr studios a wk and assigned work; field trips will be reqd at student expense; some class jury sessions will meet outside of scheduled hours. Prereq; Arch 453-454.

Arch **463-464 Environmental Control Systems** (4 cr). Principles and design of solar and mechanical heating and cooling systems, natural and artificial lighting, water and waste systems, and acoustics. Three 1-hr lec and one 2-hr lab a wk.

Arch **465-466 Building Technology II** (3 cr). Arch 465: structural design with steel in buildings; principles and technology of steel design applied to practical building problems by integrating solutions with Architectural Design studio. Arch 466: structural design of buildings with seismic analysis; principles and technology of masonry design. Prereq: ForPr 365, Arch 366, or perm.

Arch **473 Architectural Programming** (2 cr). Research and evaluation for architectural thesis program; research methods and their application.

Arch **475-476 Professional Practice I-II** (3 cr). The architect's duties and responsibilities in practice (construction documents and contracts), project supervision, office administration, and comprehensive services; specification writing, unit costs, and building estimation.

Arch **482 Preservation of the Built Environment** (2 cr). See IntPD 482.

Arch **483 Introduction to City Planning** (3 cr). History and theory of city planning and problems associated with urban growth.

Arch **484 City Planning** (2 cr). Analysis of 20th-century planning in the U.S. and Europe; group housing and urban development patterns. Prereq: Arch 483.

Arch **497 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

Arch **499** (s) **Directed Study** (cr arr). Prereq: perm.

Arch **500 Master's Research and Thesis** (cr arr).

Arch **501** (s) **Seminar** (cr arr). Prereq: perm.

Arch **502** (s) **Directed Study** (cr arr). Prereq: perm.

Arch **503** (s) **Workshop** (cr arr). Prereq: perm.

Arch **504** (s) **Special Topics** (cr arr). Prereq: perm.

Arch **597** (s) **Practicum** (cr arr). Prereq: perm.

Arch **598** (s) **Internship** (cr arr). Prereq: perm.

Arch **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

INTERIOR PLANNING AND DESIGN

IntPD **200** (s) **Seminar** (cr arr). Prereq: perm.

IntPD **203** (s) **Workshop** (cr arr). Prereq: perm.

IntPD **204** (s) **Special Topics** (cr arr).

IntPD **261 Elements and Materials of Interior Design** (3 cr). Intro to elements and materials of interiors; materials and their relationship to the elements; emphasis on design, function, construction, installation, maintenance, and relative cost of products and materials specified for interior use. One 2-hr lec and one 3-hr studio a wk.

IntPD **262 Interior Design I** (4 cr). Intro to residential interior design theory and problem solving; emphasis on space planning, materials, and components of interiors; development of presentation techniques. Field trips reqd at student expense; some class jury sessions will meet outside of scheduled hours. Prereq: Arch 156, IntPD 261.

IntPD **299** (s) **Directed Study** (cr arr). Prereq: perm.

IntPD **351-352 Interior Design II-III** (4 cr). Intro to small scale commercial interior design theory and problem solving; emphasis on formation of interior spaces to correspond to function and flow patterns. Two 3-hr studios a wk; field trips reqd at student expense; some class jury sessions outside of scheduled hours. Prereq: Arch 256 or perm.

IntPD **400** (s) **Seminar** (cr arr). Prereq: perm.

IntPD **403** (s) **Workshop** (cr arr). Prereq: perm.

IntPD **404** (s) **Special Topics** (cr arr). Prereq: perm.

IntPD **451-452 Interior Design IV-V** (4 cr). Advanced problems in commercial interior design; electrical, mechanical, and plumbing systems for interior designers; interior construction; working drawings. Two 3-hr studios a wk; field trips reqd at student expense; some class jury sessions will meet outside of scheduled hours.

IntPD **461 History of Interior Design: Antiquity to 1900** (3 cr). Historical furnishings, furniture, interior architecture, and decorative arts from antiquity to beginning of the 20th century.

IntPD **462 History of Interior Design: 20th Century** (3 cr). International in scope; social and aesthetic theories incl Arts and Crafts Movement, Art Nouveau, De Stijl, Bauhaus, International Style, Scandinavian furniture, modern classics manufactured in America by Knoll and Miller, and recent Italian innovations. Two 1 1/2-hr lec a wk. Prereq: IntPD 461.

IntPD **482 Preservation of the Built Environment** (2 cr). Same as Arch 482. Cross-disciplinary examination of historic preservation movement, including survey of preservation

history and theory; exploration of current issues concerning curatorial management and revitalization of historic structures and communities through case study. Two hrs of seminar a wk; field trips may be reqd.

IntPD **499** (s) **Directed Study** (cr arr). Prereq: perm.

Curricular Requirements

ARCHITECTURE (B.Arch.)

A five-year professional curriculum divided into two parts: preprofessional (first two years) and professional (remaining three years). Due to a limited enrollment capacity, admission to the program is highly competitive; prospective students should write to the department chair early to learn admission procedures. A cumulative GPA of 2.50 in all required courses in the two preprofessional years and the approval of a faculty review committee are required for admission to the professional program. Grades are subject to faculty review and any probation, if granted, shall be at the discretion of the faculty. The 2.50 average must be maintained in all required courses in order to remain in good standing in the department. The program is accredited by the National Architectural Accrediting Board (NAAB).

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
Arch 155 Introduction to Architecture	2
Arch 156 Graphic Communication	2
Arch 255 Advanced Architectural Graphics	2
Arch 256 Basic Architectural Design	3
Arch 266 Materials & Methods	3
Arch 353-354 Architectural Design I	10
Arch 366 Building Technology I	3
Arch 383 Architectural Site Design	3
Arch 385-386 History of Architecture	6
Arch 453-454 Architectural Design II	10
Arch 455-456 Architectural Design III	10
Arch 463-464 Environmental Control Systems	8
Arch 465-466 Building Technology II	6
Arch 473 Architectural Programming	2
Arch 475-476 Professional Practice I-II	6
Arch 483 Introduction to City Planning	3
Art 101 Visual Art	3
Art 111-112 Drawing I	4
Art 121-122 Visual Communication & the Design Process	6
CE 218 Elementary Surveying	2
ForPr 365 Wood Building Technology	3
Math 140 Pre-calculus Algebra & Analytic Geometry	3
Math 160 Survey of Calculus or Phil 211 Logic or Stat 251 Principles of Statistics	3-4
Phys 113-114, 115 General Physics & Lab	7
Electives to total 160 cr for the degree (at least 4 cr from art and 10 cr from an adviser-approved list of electives)	—

INTERIOR PLANNING AND DESIGN (B.F.A.)

A four-year professional curriculum divided into two parts: preprofessional (first two years) and professional (remaining two years). A cumulative grade-point average of 2.00 in all required courses in the two preprofessional years and the approval of a faculty review committee are required for admission to the professional program. Grades are subject to faculty review and any probation, if granted, shall be at the discretion of the faculty. The 2.00 average must be maintained in all required courses in order to remain in good standing in the department.

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
IntPD 261 Elements & Materials of Interior Design	3
IntPD 262 Interior Design I	4
IntPD 351-352 Interior Design II-III	8
IntPD 451-452 Interior Design IV-V	8
IntPD 461 History of Interior Design: Antiquity to 1900	3
IntPD 462 History of Interior Design: 20th Century	3
Arch 155 Introduction to Architecture	2
Arch 156 Graphic Communication	2
Arch 255 Advanced Architectural Graphics	2
Arch 256 Basic Architectural Design	3
Arch 266 Materials & Methods	3
Arch 384 Computer-Aided Design	2
Arch 385-386 History of Architecture	6
Arch 464 Environmental Control Systems	4
Arch 475-476 Professional Practice I-II	6
Arch 499 Directed Study	2
Art 101 Visual Art	3
Art 111-112 Drawing I	4
Art 121-122 Visual Communication & the Design Process	6
Art 221 Graphic Design	3
HEc 123 Textiles	3
Math 101 Spirit of Math or Math 111 Finite Math	3-4
Psych 100 Introduction to Psychology	3
Art electives	6
Electives to total 128 cr for the degree (incl 6 cr from a list of adviser-directed electives)	—

WOOD CONSTRUCTION AND DESIGN

For information on a major in forest products with an option in wood construction and design, see the Department of Forest Products section.

Department of Art

Frank A. Cronk, Dept. Chair (Art and Arch. Library Bldg.). Faculty: Frank A. Cronk, Nelson S. Curtis, Jill Dacey, David F. Giese, H. Lynne Haagensen, J. Willard L'Hote, R. Michael Rainey, George H. Roberts, George T. Wray. Adjunct Faculty: Johanna B. Hays, James M. Loney, William P. Woolston, Larry K. Wriggle.

The purpose of the program in art is twofold: (1) to meet the needs of all who have an interest in the visual arts and desire to gain experience in them, and (2) to provide a program designed for the development of persons who intend to practice art seriously as a professional or who plan to pursue advanced study in art. The department has a faculty, studios, and other facilities enabling the student to concentrate in one of eight specific areas, each structured to foster the development of the student in his or her chosen direction.

Graduate study is directed toward full professional competence, regardless of the degree objective. Study is based on overall artistic ability, as well as the development of a substantive personal direction. Faculty specialties and facilities are available to appropriately assist each student in attaining these goals.

Art Courses

Note: On registering for a studio course offered in this department, the student agrees that the department may retain work completed by the student.

Art **101 Visual Art** (3 cr). Satisfies core requirement J-3-d. Introductory historical overview of important visual arts to promote an understanding and appreciation of artistic output with primary emphasis on painting, sculpture, and architecture. Two 1-1/2-hr lec and one 1-hr quiz/recitation a wk.

Art **102 Survey of Art** (2 cr). Historical overview of artistic production to promote an understanding and appreciation of the various arts with emphasis on painting, sculpture, and architecture.

Art **111-112 Drawing I** (2 cr). Freehand drawing; emphasis on expressive use of materials.

Art **121-122 Visual Communication and the Design Process** (3 cr). Intro to visual communication and design process; studio problems to familiarize students with basic design process, elements of design and individual design criteria as related to traditional and experimental concepts of visual communication; studio problems explore basic design through the two- and three-dimensional production, experiences, readings, and written analysis. One lec and two 2-hr studios a wk and assigned work; attendance at outside events (lecs, symposiums, Prichard and Univ Gallery openings).

Art **200** (s) **Seminar** (cr arr). Prereq: perm.

Art **H201 Art Studio** (3 cr). Emphasis on free hand drawing using a wide range of drawing and rendering tech; intro to artistic media and concepts; guest lec and slide presentations by members of art faculty and art grad program; in-class discussion of area gallery shows and college guest lec series. Two 2-hr studios a wk and assigned work. Prereq: perm of director of University Honors Program.

Art **203** (s) **Workshop** (cr arr). Prereq: perm.

Art **204** (s) **Special Topics** (cr arr). Prereq: perm.

Art **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Art **211 Drawing II** (3 cr). Life drawing; work with various media to develop an understanding of the human figure. Prereq: Art 111-112 or perm.

Art **214 Textile Design I** (3 cr). Intro to basic textile design techniques including woven, non-woven, resist, and direct application. Two lec and 4 hrs of lab a wk; one 1-day field trip may be reqd.

Art **221 Graphic Design I** (3 cr). Basic philosophy and working processes of commercial art with stress on diverse approaches to solving basic design and communication problems; also emphasizes contemporary use of typography.

Art **225 Communication Graphics** (2 cr). Intro to graphic communication using elementary techniques emphasizing typography and advertising layout. Two 2-hr studios a wk and assignments. Not for graphics majors. Class limited to 35.

Art **231 Painting I** (3 cr). Intro to basic fundamentals of painting.

Art **241 Sculpture I** (3 cr). Studio work in basic spatial design concepts; creation of expressive order in space with attention to form, space, arrangement, movement, proportion, volume, unity, and contrast.

Art **251 Printmaking I** (3 cr). Intro to basic printmaking techniques, relief, intaglio, and serigraphy; emphasis on sensitivity to materials and individual development.

Art **261 Ceramics I** (3 cr). Intro to clay-forming tech, wheel-thrown and hand-built forming methods, ceramic design concepts, development of individual design criteria, glaze experimentation; fundamental types of ceramic ware; kiln procedures.

Art **271 Jewelry I** (3 cr). Intro to basic jewelry materials and techniques; basic jewelry design concepts; development of individual design criteria.

Art **281 Water Color I** (3 cr). Intro to techniques of water color painting by individual instruction and group criticism.

Art **299** (s) **Directed Study** (cr arr). Prereq: perm.

Art **301-302 History of Art** (3 cr). Art 301: 19th century. Art 302: 20th century.

Art **311 Drawing III** (3 cr). Advanced drawing from the model, nature, and abstract form; emphasis on individual development. Prereq: Art 211 or perm.

Art **314 Textile Design II** (3 cr). Continuation of basic textile design techniques with emphasis on individual development; printed textiles; croquis. Two lec and 4 hrs of lab a wk; one field trip may be reqd.

Art **321 Graphic Design II** (3 cr). Study of design representative of contemporary graphic design; technical aspects of commercial design; preparation of art for the print medium; projects deal with design for print, TV, and various 3-D media. Prereq: Art 221.

Art **331 Painting II** (3 cr). Intermediate painting from the model, nature, and abstract form. Prereq: Art 231 or perm.

Art **341 Sculpture II** (3 cr). Studio investigation of various sculptural concepts, materials, and techniques. A common project is done with the Dept of Landscape Architecture. Prereq: Art 241 or perm.

Art **351 Printmaking II** (3 cr). Continuation of basic printmaking techniques; emphasis on individual development. Prereq: Art 251 or perm.

Art **361 Ceramics II** (3 cr). Continuation of basic clay-forming and glazing techniques; emphasis on expressive use of materials, design criteria, and development of individual concepts. Prereq: Art 261 or perm.

Art **371 Jewelry II** (3 cr). Advanced jewelry techniques: casting, etching, enameling, metalsmithing, and related areas, processes, and materials; emphasis on both technique and design. Prereq: Art 271 or perm.

Art **381 Water Color II** (3 cr). Techniques of water color painting; sketching from still life and nature. Prereq: Art 281 or perm.

Art **400** (s) **Seminar** (cr arr). Prereq: perm.

Art **403** (s) **Workshop** (cr arr). Prereq: upper-div standing and perm.

Art **404** (s) **Special Topics** (cr arr). Prereq: perm.

Art **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Art **411 Drawing IV** (3 cr, max 12). Advanced drawing with emphasis on individual development. Prereq: Art 331 or perm.

Art **414 Textile Design III** (3 cr, max 12). Advanced textile design problems; emphasis on individual dev; designing for industry. One lec and 4 hrs of lab a wk.

Art **421 Graphic Design III** (3 cr, max 12). Adv design problems; projects are actual design problems drawn from campus community. One 5-day field trip spring semester. Prereq: Art 321 or perm.

Art **431 Painting III** (3 cr, max 12). Advanced painting with emphasis on individual development. Prereq: Art 331 or perm.

Art **441 Sculpture III** (3 cr, max 12). Studio investigation of advanced sculptural concepts, materials, and techniques. A common project is done with the Dept of Landscape Architecture. Prereq: Art 341 or perm.

Art **451 Printmaking III** (3 cr, max 12). Advanced printmaking techniques; intro to lithography; emphasis on individual development. Prereq: Art 351 or perm.

Art **461 Ceramics III** (3 cr, max 12). Advanced work in clay-forming techniques, glaze experimentation, and kiln procedures; continuation of individual studio work. Prereq: Art 361 or perm.

Art **471 Jewelry III** (3 cr, max 12). Advanced jewelry techniques with emphasis on design. Prereq: Art 371 or perm.

Art **481 Water Color III** (3 cr, max 12). Advanced water color painting; sketching from still life and nature, emphasizing individual development. Prereq: Art 381 or perm.

Art **488 Faculty Directed Internship** (1-3 cr, max 9). Experience in professional practices under art faculty supervision. Graded P/F. Prereq: upper-div standing.

Art **490 Gallery** (1 cr, max 4). Descriptive analysis of gallery functions; hands-on student participation installing, packaging art works for shipping, lighting, promotions, advertising, and marketing; speakers series of professionals in the field and in allied areas, e.g., gallery directors, artists as presenters/installers, professional art movers. Prereq: adv standing or perm.

Art **495 Senior Thesis Show** (1 cr). Preparation of BFA thesis show. Graded P/F. Prereq: sr standing.

Art **496 Graphics Proseminar** (1 cr). Seminar in professional art practices; exposure to areas, processes, and problems of professional practice; contact with area professionals; emphasis on development of portfolio. Graded P/F. Prereq: upper-div standing.

Art **497 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

Art **498** (s) **Internship** (1-12 cr, max 12). Supervised experience in professional practice. Graded P/F. Prereq: perm of dept chair.

Art **499** (s) **Directed Study** (1-4 cr, max 12). Individual study areas selected by the student and approved by the faculty; it is the student's responsibility to select a study area and prepare a semester study program; the student contacts one of the art faculty who agrees to direct the study; it is the student's responsibility to initiate the study program and to maintain regular contact with the faculty member who has agreed to direct the study. Prereq: upper-div standing and perm.

Art **500 Master's Research and Thesis** (cr arr).

Art **501** (s) **Graduate Seminar** (3 cr, max 6). Seminar in professional art concerns; College Guest Art Programs and University Gallery activities included; field trips. Prereq: grad standing.

Art **502** (s) **Directed Study** (cr arr). Prereq: perm.

Art **503** (s) **Workshop** (cr arr). Prereq: perm.

Art **504** (s) **Studio Problems** (cr arr).

Art **505** (s) **Special Topics** (cr arr). Prereq: perm.

Art **506** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Art **597** (s) **Practicum** (cr arr). Prereq: perm of art grad coordinator.

Art **598** (s) **Internship** (cr arr). Prereq: perm.

Art **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Curricular Requirements

ART (B.F.A.)

Required course work includes the university requirements (see regulation J-3) and a studio emphasis in one of the following areas: drawing, graphic design, painting, textile design, sculpture, printmaking, ceramics, jewelry, and watercolor.

Course	Credits
Art 101 Visual Art	3
Art 111-112 Drawing I	4
Art 121-122 Visual Communication & the Design Process	6
Art 211 Drawing II	3
Art 241 Sculpture I	3
Art 301-302 History of Art	6
Art 311 Drawing III	3
Art 490 Gallery	2
Art 495 Senior Thesis Show	1
Courses selected from the following	7-9
Art 214 Textile Design I	
Art 221 Graphic Design I	
Art 231 Painting I	
Art 251 Printmaking I	
Art 261 Ceramics I	
Art 271 Jewelry I	
Art 281 Water Color I	
Courses selected from the following	6
Arch 385 History of Architecture	
Arch 386 History of Architecture	
CommG 382 History of Photography	
CommG 384 History of American Film	
Comm 445 History of Mass Communication	
HEc 329 Historic Costume	
IntPD 461 History of Interior Design: Antiquity to 1900	
IntPD 462 History of Interior Design: 20th Century	
Art studio electives: three courses selected from Art 314, 321, 331, 341, 351, 361, 371, 381	9
Art studio emphasis: three semesters in 400-level studio	9
Art studio electives: two courses in addition to the art studio emphasis above, selected from Art 411, 414, 421, 431, 441, 451, 461, 471, 481	6
Electives to total 128 cr for the degree	—

Students who wish to gain an area emphasis in graphic design must include Art 496, Graphics Proseminar, in their programs.

ART (B.A.)

Required course work includes the university requirements (see regulation J-3), the general requirements for the B.A. degree, and:

Course	Credits
Art 101 Visual Art	3
Art 111-112 Drawing I	4
Art 121-122 Visual Communication & the Design Process	6
Art 211 Drawing II	3
Art 241 Sculpture I	3
Art 301-302 History of Art	6
Art 311 Drawing III	3
Courses selected from the following	7-9
Art 214 Textile Design I	
Art 221 Graphic Design I	
Art 231 Painting I	
Art 251 Printmaking I	
Art 261 Ceramics I	
Art 271 Jewelry I	
Art 281 Water Color I	
Courses selected from the following	6

Arch 385 History of Architecture
Arch 386 History of Architecture
CommG 382 History of Photography
CommG 384 History of American Film
HEc 329 Historic Costume
IntPD 461 History of Interior Design: Antiquity to 1900
IntPD 462 History of Interior Design: 20th Century
Three art studio electives selected from Art 314, 321, 331, 341, 351, 361, 371, or 381 9
One art studio elective selected from Art 411, 414, 421, 431, 441, 451, 461, 471, or 481 3
Electives to total 128 cr for the degree ..... —

ART EDUCATION (B.S.Art Ed.)

Note: For registration in upper-division courses in the field of education, students must have been admitted to the teacher education program and have a GPA of 2.5, unless a higher average is stated as a prerequisite in the course description. For admission criteria, refer to "Admission to the Teacher Education Program" in the College of Education section of part four of this catalog.

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
Art 101 Visual Art	3
Art 111-112 Drawing I	4
Art 121-122 Visual Communication & the Design Process	6
Art 211 Drawing II	3
Art 241 Sculpture I	3
Art 301-302 History of Art	6
Art 311 Drawing III	3
Courses selected from the following	7-9
Art 214 Textile Design I	
Art 221 Graphic Design I	
Art 231 Painting I	
Art 251 Printmaking I	
Art 261 Ceramics I	
Art 271 Jewelry I	
Art 281 Water Color I	
Courses selected from the following	6
Arch 385 History of Architecture	
Arch 386 History of Architecture	
CommG 382 History of Photography	
CommG 384 History of American Film	
HEc 329 Historic Costume	
IntPD 461 History of Interior Design: Antiquity to 1900	
IntPD 462 History of Interior Design: 20th Century	
Three art studio electives selected from Art 314, 321, 331, 341, 351, 361, 371, or 381	9
Two art studio electives selected from Art 411, 414, 421, 431, 441, 451, 461, 471, or 481	6
Ed 201 Introduction to Teaching	2
Ed 314 Strategies for Teaching	3
Ed 328 Audiovisual Aids	1
Ed 340 Methods of Teaching Content Reading	3
Ed 431 or Ed 431 and 435 Practicum	9
Ed 445 Proseminar in Teaching	3
Ed 468 Historical & Philosophical Foundations of Education	3
Ed 479 Secondary School Art Methods	2
Psych 305 or Ed 312 Developmental or Educational Psychology	2-3
Electives to total 128 cr for the degree	—

PHOTOGRAPHY (B.F.A.)

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
Art 101 Visual Art	3
Art 111-112 Drawing I	4
Art 121-122 Visual Communication & the Design Process	6
Art 211 Drawing II	3
Art 241 Sculpture I	3
Art 301-302 History of Art	6
Art 311 Drawing III	3
Art 404 Special Topics: Pinhole	3
Art 404 Special Topics: Airbrush	3
Art 490 Gallery	2
Art 495 Senior Thesis Show	1
Courses selected from the following	7-9
Art 214 Textile Design I	
Art 221 Graphic Design I	
Art 231 Painting I	
Art 251 Printmaking I	
Art 261 Ceramics I	
Art 271 Jewelry I	
Art 281 Water Color I	
Two art studio electives selected from Art 314, 321, 331, 341, 351, 361, 371, 381	6
One art studio elective selected from Art 411, 414, 421, 431, 441, 451, 461, 471, 481	3
Comm 281 Understanding Photography	3
Comm 381 Photographic Materials & Techniques	3
Comm 385 Color Photography	3
Comm 404 Special Topics: Portfolio	3
Comm 481 Advanced Black & White Photography	3
Comm 485 Advanced Color Photography	3
CommG 382 History of Photography	3
CommG 384 History of American Film	3
Inter 126 Film & International Culture	3

Academic Minor Requirements

ART MINOR

Course	Credits
Art 101 Visual Art	3
Art 111-112 Drawing I	4
Art 121-122 Visual Communication & the Design Process	6
And one of the following areas	9
200- and 300-level art studio classes	
Art 211, 311, 411 Drawing	
Art 214, 314, 414 Textile Design	
Art 221, 321, 421 Graphic Design	
Art 231, 331, 431 Painting	
Art 241, 341, 441 Sculpture	
Art 251, 351, 451 Printmaking	
Art 261, 361, 461 Ceramics	
Art 271, 371, 471 Jewelry	
Art 281, 381, 481 Water Color	

Department of Bacteriology and Biochemistry

Richard C. Heimsch, Acting Dept. Head (142 Life Sc. Bldg).

Bacteriology Faculty: Carolyn H. Bohach, Gregory A. Bohach, Donald L. Crawford, Ronald L. Crawford, Richard C. Heimsch, Scott T. Kellogg, Al J. Lingg, Scott A. Minnich, Cindy S. Orser. Adjunct Faculty: Philip H. Berger, Guy R. Knudsen. Affiliate Faculty: Patrick R. Dugan, Robert W. Ellis, James K. Fredrickson, David R. Quigley, Robert Rychert, Dennis L. Stevens, Marcia Wicklow-Howard.

Biochemistry Faculty: Nancy A. Federspiel, Daniel Guerra, Duane J. LeTourneau, Bruce L. Miller, David J. Oliver, William R. Trumble. Adjunct Faculty: Alton G. Campbell, Matthew Morra. Affiliate Faculty: Debonny Barsky-Shoaf, Richard A. Callahan, Frederick Leung.

Bacteriology is concerned with the study of microscopic forms of life, their distribution, importance, and role in such diverse areas as control and diagnosis of diseases, agricultural biotechnology, environmental and pollution control, and genetic engineering.

Biochemistry is the study of the molecular basis of life, the chemical and physical properties of living things, and their metabolic processes.

The Department of Bacteriology and Biochemistry offers the degree of Bachelor of Science in Bacteriology in both the College of Agriculture and the College of Letters and Science. Students may choose to emphasize general microbiology, or molecular biology by appropriate choices of courses. In addition, the department offers the degree of Bachelor of Science in Medical Technology for students who have earned the Bachelor of Science in Bacteriology at UI and have completed medical technology training in an accredited hospital school. Because of the interdisciplinary nature of biochemistry, preparation in both chemistry and biology, in addition to biochemistry, is required. Students interested in biochemistry are advised by members of the biochemistry faculty, but should enroll in the general chemistry (B.S.) or professional chemistry (B.S.) curriculum. In each case, the curriculum emphasizes the need for a broad cultural base and specific training in biology, chemistry, mathematics, and physics, in addition to courses in the specialty area. Well-equipped laboratories are available and advanced students are encouraged to undertake research problems with the faculty. The department also provides courses for students who are majoring in other areas of the university and wish to obtain increased understanding of the sciences. Students are invited to inquire about academic minors in the department.

The department offers the M.S. and Ph.D. degrees in both bacteriology and biochemistry. Excellent facilities are available for graduate studies and research. Research interests of the faculty include immunology and immunoregulation, microbial pathogenesis, membrane biochemistry, microbial ecology, microbial physiology, molec-

ular genetics, nucleic acids (including recombinant DNA), and plant biochemistry. Students should contact the department or individual faculty members and consult the *Graduate Bulletin* for additional details and information concerning graduate assistantships.

Courses

BACTERIOLOGY

Bact **101 Food and Life** (3 cr). World food problems; concepts of nutritional adequacy; processing, microbiology, preservation, and packaging of foods; additives and regulations.

Bact **105 Survey of Biotechnology** (1 cr). Descriptions and discussions of research and career opportunities in biotechnology; genetic engineering concepts; pharmaceutical, environmental, plant and animal systems.

Bact **154 Principles of Microbiology** (3-4 cr). Includes lab when taken for 4 cr; cannot be taken by bacteriology majors and carries no cr after Bact 250. Intro to microorganisms and their role in disease, health, foods, and the environment; current topics in microbiology.

Bact **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Bact **250 General Microbiology** (4 cr). Satisfies core requirement J-3-b. Intro to nature and activity of bacteria and other microorganisms; their importance in all life systems. Three lec and one 3-hr lab a wk. Prereq: Chem 103 or 111.

Bact **304 Pathogenic Bacteriology** (3 cr). Epidemiology, host-parasite relationships, pathology, host response to injury; treatment, prevention, and control of pathogenic bacteria and chlamydiae. Prereq: Bact 250.

Bact **305 Pathogenic Bacteriology Lab** (2 cr). Isolation, cultivation, morphological, biochemical, and serological identification of pathogenic bacteria. Two 2-hr labs a wk. Prereq or coreq: Bact 304.

Bact **389 Internship** (1-6 cr, max 6). Graded P/F. Prereq: perm of dept.

Bact **400** (s) **Seminar** (cr arr). Graded P/F. Prereq: perm.

Bact **ID402 Food and Applied Microbiology** (4 cr). WSU FSHN 416. Microorganisms important in foods; spoilage; preservation; food-borne disease. Two lec and two 3-hr labs a wk. Prereq: Bact 250.

Bact **J403/J503 Advanced Microbial Physiology** (2-4 cr). Use of current literature to study recent advances in research on the physiology of microorganisms. Registration for 3 or 4 cr requires additional project or lab work. Registration for grad cr requires term paper or other additional effort. Prereq: Bact 460 or perm.

Bact **404** (s) **Special Topics** (cr arr).

Bact **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Bact **409 Immunology** (3 cr). Theory and mechanisms of the cellular basis of immune response; antibody structure, function, and synthesis; cell-mediated immunity; complement; hypersensitivity; immunologic diseases; transportation; tumor immunity. Prereq: Bact 250.

Bact **410 Immunology Lab** (2 cr). Serologic reactions; analytical techniques such as immunodiffusion, immunoelectrophoresis, immunofluorescence, and enzyme-linked antibody techniques. Two 2-hr labs a wk. Prereq or coreq: Bact 409.

Bact **414 Advanced Lab Methods** (4 cr). Clinical and research procedures in theory and practice. Two lec and two 3-hr labs a wk. Prereq: Bact 250, 304, Chem 253.

Bact **WS420 Epidemiology** (3 cr). WSU Micro 420.

Bact **421 Clinical Diagnosis: Internship** (1-32 cr, max 32). Successful completion of a clinical lab program in an accredited hospital or public health lab. Prereq: Bact 414 and perm of dept.

Bact **425 Microbial Ecology** (4 cr). Same as Soils 425. Biogeochem activities and relationships of microorganisms in soil, water, plants, and animals. Two lec and two 3-hr labs a wk; two 1-day field trips. Prereq: Math 111 or 160 or 180; Stat 251; Bact 250.

Bact **J431/J531 Recombinant DNA Lab** (3 cr). Same as Biochem J431/J531. Intro to handling nucleic acids and recombinant organisms. Term paper or other additional projects/assignments reqd for grad cr. Prereq: Bact J485/J585 and perm.

Bact **460 Microbial Physiology** (5 cr). WSU Soils 436. Concepts of microbial growth, metabolism, regulation, variation, structural-functional relationships. Three lec and two 2-hr labs a wk. Prereq: Bact 250.

Bact **481 Virology** (3 cr). Alt/yrs. Same as VS 481. Biochem of replication and structure of animal, plant, and bacterial viruses. Prereq: Biochem 380 or 481 and Genet 314.

Bact **483 Virology Lab** (1 cr). See VS 483.

Bact **ID-J485/J585 Molecular Genetics I** (3 cr). Same as Biochem and Genet J485/J585. WSU GenCB 485. Molecular basis of genetics in prokaryotes; bacterial genetics; DNA, RNA, protein biosynthesis; genetic engineering. Term paper or other additional projects/assignments reqd for grad cr. Prereq: Biochem 380, Genet 314.

Bact **ID-J487/J587 Molecular Genetics II** (3 cr). Same as Biochem ID-J487/J587. WSU GenCB 487. Molecular basis of genetics in eukaryotes. Term paper or other additional projects/assignments reqd for grad cr. Prereq: Bact J485/J585 or perm.

Bact **498 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

Bact **499** (s) **Directed Study** (cr arr). Prereq: perm.

Bact **500 Master's Research and Thesis** (cr arr).

Bact **501** (s) **Seminar** (cr arr). Graded P/F. Prereq: perm.

Bact **502** (s) **Directed Study** (cr arr). Areas normally offered are: aquatic, food, genetics, immunology, medical, microbial ecology, molecular biology, physiology, and soils. Prereq: perm.

Bact **503 Advanced Microbial Physiology** (2-4 cr). See Bact J403/J503.

Bact **504** (s) **Special Topics** (cr arr).

Bact **ID505 Microbial Biotechnology** (2-4 cr). Industrial microbial processes and lab methods. Two lec, or two lec with labs, a wk. Prereq: Bact 250, Chem 372, or perm.

Bact **506** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Bact **507 Bacterial Taxonomy** (2 cr). Determination of and differentiation between taxonomic groups of bacteria; molecular/chemical taxonomic techniques. Prereq: Bact 250, 304.

Bact **WS512 Immunology** (3 cr). WSU Micro 512.

Bact **WS529 Research Techniques in Microbiology** (3 cr). WSU Micro 529.

Bact **531 Recombinant DNA Lab** (3 cr). See Bact J431/J531.

Bact **540 Molecular Virology** (3 cr). Alt/yrs. Same as Biochem 540. Recent advances on molecular aspects of virus replication and mechanisms of genome expression. Prereq: Bact J485/J585.

Bact **585 Molecular Genetics I** (3 cr). See Bact J485/J585.

Bact **587 Molecular Genetics II** (3 cr). See Bact J487/J587.

Bact **597** (s) **Practicum** (cr arr). Prereq: perm.

Bact **598** (s) **Internship** (cr arr). Prereq: perm.

Bact **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Bact **600 Doctoral Research and Dissertation** (cr arr).

BIOCHEMISTRY

Biochem **380 Introductory Biochemistry** (3 cr). Max 7 cr in any combination of Biochem 380 or J481/J541 and J482/J542. Survey of structure, function, and metabolism of major constituents of living systems. Prereq: Chem 103 and 275.

Biochem **382 Introductory Biochemistry Lab** (1 cr). Lab training in modern methods. One 3-hr lab a wk. Prereq: Chem 103, 278; prereq or coreq: Biochem 380 or equiv.

Biochem **389 Internship** (1-6 cr, max 6). Graded P/F. Prereq: perm of dept.

Biochem **400** (s) **Seminar** (cr arr). Graded P/F. Prereq: perm.

Biochem **401 Undergraduate Research** (1-2 cr, max 4). Individual study. Prereq: sr standing and perm.

Biochem **404** (s) **Special Topics** (cr arr).

Biochem **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Biochem **J431/J531 Recombinant DNA Lab** (3 cr). See Bact J431/J531.

Biochem **ID-J481-ID-J482/ID-J541-ID-J542 Biochemistry** (3 cr). Same as Chem J481-J482/J541-J542. WSU BC/BP 364/563-564. Max 7 cr in any combination of Biochem 380, J481/J541, and J482/J542. Intermediate biochemistry; intro to metabolism and the chemical and physical properties of biomolecules. Additional projects/assignments reqd for grad cr. Prereq: Chem 372; coreq: Chem 302 or 306 or perm.

Biochem **483-484 Biochemistry Lab** (2 cr). Same as Chem 483-484. Biochemical techniques for the study of proteins, lipids, nucleic acids, enzymes, and intermediary metabolism. Two 3-hr labs a wk. For Biochem 483, prereq: Chem 253; coreq: Biochem 481. For Biochem 484, prereq: Biochem 483; coreq: Biochem 482.

Biochem **ID-J485/J585 Molecular Genetics I** (3 cr). See Bact J485/J585.

Biochem **486 Plant Biochemistry** (3 cr). Alt/yrs. Same as Chem 486. Composition and metabolism of higher plants with emphasis on secondary plant products. Prereq: Biochem 380.

Biochem **ID-J487/J587 Molecular Genetics II** (3 cr). See Bact J487/J587.

Biochem **499** (s) **Directed Study** (cr arr). Prereq: perm.

Biochem **500 Master's Research and Thesis** (cr arr).

Biochem **501** (s) **Seminar** (cr arr). Graded P/F. Prereq: perm.

Biochem **502** (s) **Directed Study** (cr arr). Prereq: perm.

Biochem **506** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Biochem **531 Recombinant DNA Lab** (3 cr). See Biochem J431/J531.

Biochem **ID537 Soil Biochemistry** (3 cr). WSU Soils 537. See Soils 537.

Biochem **540 Molecular Virology** (3 cr). See Bact 540.

Biochem **ID541-ID542 Biochemistry** (3 cr). See Biochem J481-J482/J541-J542.

Biochem **WS569 Nucleic Acid Biochemistry** (3 cr). WSU BC/BP and GenCB 569.

Biochem **WS578 Molecular Biology Computer Techniques** (3 cr). WSU BC/BP 578.

Biochem **581 Carbohydrates** (3 cr). Alt/yrs. Same as Chem 581. Structure, function, and metabolism of carbohydrates. Prereq: Biochem 482 or perm.

Biochem **582 Proteins and Enzymes** (3 cr). Alt/yrs. Same as Chem 582. Protein structure and function; mechanisms of enzyme action. Prereq: Biochem 481.

Biochem **583 Lipids and Membranes** (3 cr). Alt/yrs. Same as Chem 583. Biosynthesis and metabolism of major classes of complex lipids and sterols; structure, function, and properties of biomembranes and membrane models. Prereq: Biochem 482.

Biochem **584 Nucleic Acids** (3 cr). Alt/yrs. Same as Chem 584. Structure, function, and metabolism of nucleic acids. Prereq: Biochem 482.

Biochem **585 Molecular Genetics I** (3 cr). See Biochem J485/J585.

Biochem **587 Molecular Genetics II** (3 cr). See Biochem J487/J587.

Biochem **589 Advanced Topics in Biochemistry** (1-9 cr, max 9). Same as Chem 589. Recent research in enzymes, hormones, complex lipids, vitamins, nucleic acids, antibiotics, viruses, and biochem genetics. Prereq: perm.

Biochem **600 Doctoral Research and Dissertation** (cr arr).

Curricular Requirements

BACTERIOLOGY

The undergraduate curricula in bacteriology prepare students for obtaining interesting and challenging careers in biotechnology, public health, medical technology, industry, and agricultural research laboratories. The major is suitable for those intending to apply to graduate schools or professional programs of dentistry, medicine, or veterinary science.

BACTERIOLOGY (B.S.Bact.)

This program is offered through the College of Agriculture and is designed for students who desire professional careers in basic and applied aspects of microbiology (terrestrial, aquatic, food, industrial) related to agriculture, including careers in biotechnology and human and veterinary medicine. This curriculum stresses microbial ecology of natural systems, aspects of disease and pollution control, and basic mechanisms of microbial growth, metabolism, and genetics.

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
Bact 250 General Microbiology	4
Bact 304, 305 Pathogenic Bacteriology & Lab	5
Bact 400 Seminar	1
Bact 402 Food & Applied Microbiol or 425 Microbial Ecology	4
Bact 409, 410 Immunology & Lab or 460 Microbial Physiology	5
Biochem 380, 382 Introductory Biochemistry & Lab	4
Biol 201 Introduction to the Life Sciences	4
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
Chem 253 Quantitative Analysis	5
Chem 277, 278 Organic Chemistry I & Lab	4
Chem 372 Organic Chemistry II	3
CommG 131 Fundamentals of Public Speaking or 233 Interpersonal Communication	2-3
Eng 313 Business Writing or 317 Tech & Engr Report Writing	3
Math 111, 160 Finite Math & Survey of Calculus or 180 Analytic Geometry & Calculus I	4-8
Phys 113-114-115-116 General Physics & Lab	8
Stat 251 Principles of Statistics	3
Science electives (including at least 3-4 cr in bact)	16
Humanities and social sciences electives	14
Electives to total 128 cr for the degree	—

Strongly recommended science electives:
- Bact 425 Microbial Ecology or 402 Food & Applied Microbiol
- Bact 460 Microbial Physiology or 409, 410 Immunology & Lab
- Bact 481, 483 Virology & Lab
- Bact 485 Molecular Genetics
- Bact 499 Directed Study
- AnSc 305 Animal Nutrition
- AnSc 451 Endocrine Physiology
- Biol 202 General Zoology or PlSc 102 Intro to Plant Sc
- Biol 331, 332 General Ecology & Methods in Ecology
- Biol 351, 352 General Genetics & Experimental Genetics
- Chem 302 Principles of Physical Chemistry
- Chem 376 Organic Chemistry II Lab
- VS 371 Anatomy & Physiology
- VS 474 Animal Disease

Note: For students who wish to enter a school of veterinary medicine, it is possible to obtain the B.S.Bact. degree by substituting VS 474 for Bact 402/425. Under this plan VS 371 is required, Chem 253 is optional, and AnSc 305, 451, 452, and VS/Bact 481 are strongly recommended. This option may not be used in double majors.

BACTERIOLOGY (B.S.)

This program is offered through the College of Letters and Science and is designed for students who desire professional careers or who are preparing for graduate study in areas of microbiology related to public health, medical technology, industrial microbiology, basic microbiology, microbial genetics, immunology, or virology as well as human and veterinary medicine.

Required course work includes the university requirements (see regulation J-3), the general requirements for the B.S. degree, and:

Course	Credits
Bact 250 General Microbiology	4
Bact 304, 305 Pathogenic Bacteriology & Lab	5
Bact 400 Seminar	1
Bact 409, 410 Immunology & Lab	5
Bact 460 Microbial Physiology	5
Biochem 380, 382 Introductory Biochemistry & Lab	4
Biol 201 Introduction to the Life Sciences	4
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
Chem 253 Quantitative Analysis	5
Chem 277, 278 Organic Chemistry I & Lab	4
Chem 372 Organic Chemistry II	3
CommG 131 Fundamentals of Public Speaking or 233 Interpersonal Communication	2-3
Math 111, 160 Finite Math & Survey of Calculus or 180 Analytic Geometry & Calculus I	4-8
Phys 113-114-115-116 General Physics & Lab	8
Science electives (including at least 3 cr in bact)	16
Electives to total 128 cr for the degree	—

Strongly recommended science electives:
- Bact 402 Food & Applied Microbiology
- Bact 414 Advanced Lab Methods
- Bact 425 Microbial Ecology
- Bact 481, 483 Virology & Lab
- Bact 485 Molecular Genetics I
- Bact 499 Directed Study
- Biol 202 General Zoology or 203 General Botany
- Biol 331, 332 General Ecology & Methods in Ecology
- Biol 351, 352 General Genetics & Experimental Genetics
- Chem 302 Principles of Physical Chemistry
- Chem 376 Organic Chemistry II Lab
- Stat 251 Principles of Statistics
- Zool 119 Human Anatomy & Physiology
- Zool 414, 415 Cell Physiology & Lab
- Zool 418 Parasitology

MEDICAL TECHNOLOGY OPTION

The medical technologist performs critical laboratory tests and analytical procedures that aid physicians in the diagnosis and treatment of disease. The curriculum is of interest to students desiring professional careers in hospital and clinical laboratories, public health and research laboratories, and pharmaceutical laboratories.

Students who wish to apply for clinical training in medical technology at an accredited hospital will be required to take Bact 414, Zool 119, and Zool 418. Upon completion of the B.S. degree in bacteriology (medical technology option), those students who successfully complete 32 credits (Bact 421) in a 12-month training course at an accredited hospital school of medical technology with a curriculum including clinical bacteriology, medical mycology, parasitology, clinical chemistry, toxicology, urinalysis, hematology, immunology-serology, immunohematology, and clinical correlations will be awarded the B.S. degree with major in medical technology. This second degree option is open only to students who have earned the B.S. in bacteriology at UI.

BIOCHEMISTRY

Because of the interdisciplinary nature of biochemistry, preparation in both chemistry and biology, in addition to biochemistry, is required. The student may prepare for career opportunities in medical, biological, and agricultural fields, and the curriculum provides an excellent background for those intending to apply to graduate or professional schools. Students interested in majoring in biochemistry are advised by members of the biochemistry faculty, but should enroll in the general chemistry (B.S.) or professional chemistry (B.S.) curriculum in the College of Letters and Science. In addition to courses indicated in the chemistry curriculum, students, in consultation with their advisers, will select courses that may include any of the following:

- Biochem 481-482, 483-484 Biochemistry & Lab
- Biochem 485 Molecular Genetics I
- Biochem 486 Plant Biochemistry
- Biochem 499 Directed Study
- Bact 250 General Microbiology
- Bact 460 Microbial Physiology
- Bact 481 Virology
- Biol 201 Introduction to the Life Sciences
- Biol 202 General Zoology or 203 General Botany
- Biol 351, 352 General & Experimental Genetics
- Zool 414, 415 Cell Physiology & Lab

Academic Minor Requirements

BACTERIOLOGY MINOR

Course	Credits
Bact 250 General Microbiology	4
Bact 304, 305 Pathogenic Bacteriology & Lab	5
Bact 409, 410 Immunology & Lab	5
Bact 460 Microbial Physiology	5

BIOCHEMISTRY MINOR

Course	Credits
Biochem 481-482 Biochemistry	6
Courses selected from the following	12
Biochem 382 Introductory Biochemistry Lab or 483-484 Biochemistry Lab (1 or 4 cr)	
Biochem 400 Seminar (2 cr)	
Biochem 401 Undergrad Research (1-4 cr)	

Biochem 485 Molecular Genetics (3 cr)
Biochem 486 Plant Biochemistry (3 cr)
Chem 302, 303 Principles of Physical Chemistry & Lab (or equiv) (4 cr)

Department of Biological Sciences

Arthur W. Rourke, Dept. Chair (252 Life Sc. Bldg.). Faculty: Doyle E. Anderegg, John A. Byers, Joseph G. Cloud, Mark E. DeSantis, Victor P. Eroschenko, Douglass M. Henderson, Rolf Ingermann, Donald R. Johnson, Michael B. Laskowski, Thomas A. McKean, Rodney A. Mead, Fred W. Rabe, Arthur W. Rourke, George G. Spomer, Holly A. Wichman.

The biological sciences deal with the basic biological principles of all living things with major emphasis on both plant and animal forms.

The Department of Biological Sciences offers several undergraduate curricular options in botany, zoology, and biology. Though all curricula involve exposure to concepts fundamental to plants and animals, degrees in zoology and botany allow students to emphasize course work dealing with animals and plants, respectively. All curricula are designed to introduce the undergraduate to modern molecular approaches to the life sciences as well as more classical approaches.

The department offers both B.A. and B.S. degrees in biology, botany, and zoology. Graduates from the department traditionally enter a variety of fields and many continue their education. Recent graduates have entered allied health professions, agribusiness, medical school, veterinary school, graduate school, state and national agencies that deal with biology (e.g., fish and game departments, EPA), as well as a variety of consulting agencies.

Faculty and facilities are available to teach and conduct research in animal and plant ecology, reproductive biology, comparative, cellular, and organ physiology, plant physiology, aquatic biology, evolutionary biology of fishes, birds, and mammals, systematic botany, developmental plant anatomy, vertebrate behavior, and genetics.

The department offers a nonthesis graduate degree, the M.Nat.Sc., which is designed to increase the breadth and depth of understanding of biology and is designed primarily for secondary teachers. The M.S. and Ph.D. degrees in botany and zoology are also offered.

Students with any questions should call the department chair at (208) 885-6280.

Courses

Note: Enrollment in lab sections of departmental courses will be limited to the number of stations available in that section.

BIOLOGY

Biol **100 Introduction to Biology** (4 cr). Satisfies core requirement J-3-b. Not open to majors or for minor cr. Intro to basic principles of biological systems. Three lec, one recitation, and one 2-hr lab a wk.

Biol **101 Perspectives in Biology** (1 cr). Intro to the disciplines in the fields of biology; current research topics. Graded P/F.

Biol **150 Heredity and Man** (2 cr). Same as Genet 106. Not open for cr to majors, minors, or students who have previous cr in genetics. Inheritance with emphasis on man.

Biol **190 Natural History of Pacific Northwest** (3 cr). Intro to vegetation, fleshy fungi, and vertebrate faunas of Pacific Northwest, emphasizing their distribution and ecology as influenced by geol and climate. One 1-day field trip.

Biol **201 Introduction to the Life Sciences** (4 cr). Satisfies core requirement J-3-b. Biol principles important in understanding animals, plants, and microorganisms; cytology; ecology; evolution; genetics; growth; molecular biol; physiology. Three lec, one 3-hr lab, and one 1-hr recitation a wk. Prereq: one semester college chemistry recommended.

Biol **202 General Zoology** (4 cr). Anatomy, embryology, histology, and physiology of vertebrate and invertebrate animals; the animal kingdom. Three lec and two 2-hr labs a wk. Prereq: Biol 201.

Biol **203 General Botany** (4 cr). Growth, development, and ecology of angiosperms in relation to heredity and environment; comparisons of angiosperms with other plant-kingdom divisions. Three lec and two 2-hr labs a wk. Prereq: Biol 201.

Biol **207 Introduction to Oceanography** (3 cr). Geological, physical, chemical, and biological features of oceans; biology emphasized. Prereq: Biol 100 or 201.

Biol **331 General Ecology** (3 cr). Basic ecologic principles and processes affecting the nature and occurrence of populations, communities, and biomes. Prereq: one yr of biol.

Biol **332 Methods in Ecology and Field Biology** (2 cr). Intro to basic techniques used in ecology and other biological field investigations. One recitation and one 3-hr lab a wk; two 1-day field trips. Prereq or coreq: Biol 331.

Biol **351 General Genetics** (3 cr) (C). Same as Genet 314. Genetic mechanisms in animals, plants, and microorganisms. Prereq: Biol 201.

Biol **352 Experimental Genetics** (2). Same as Genet 315. Techniques for genetic analysis at the organismal and molecular levels. Two 3-hr labs a wk. Prereq or coreq: Biol 351 or Genet 314.

Biol **361 Biological Literature** (1 cr). Botanical and zoological literature. Prereq: Biol 201 or equiv.

Biol **405 Biological Lab Procedures** (1 or 2 cr). Organization, preparation, and assisting in lab experiments or demonstrations under faculty supervision. Graded P/F. Prereq: perm.

Biol **431 Environmental Science and Pollutants** (3 cr). Structure and function of ecosystems, sources and characteristics of hazardous materials, mechanisms and pathways of pollutant transport and degradation, mechanisms of pollutant impact on ecosystems and human health. Prereq: Biol 100 or 201 and Chem 103 or 111.

Biol **442 Biological Evolution** (3 cr). Genetic, ecological, and paleontological aspects of evolution, including that of man. Prereq: Biol 202 and 351, or perm.

Biol **451 Cytology** (3 cr). Structure and function of the nucleus and cytoplasm in animal and plant cells. Two lec and one 3-hr lab a wk. Prereq: Biol 351.

Biol **499** (s) **Directed Study** (cr arr). Prereq: perm.

Biol **501** (s) **Seminar** (cr arr). Prereq: perm.

Biol **502** (s) **Directed Study** (cr arr). Prereq: perm.

Biol **503** (s) **Workshop** (cr arr). Prereq: perm.

Biol **504** (s) **Special Topics** (cr arr). Prereq: perm.

Biol **505 Colloquium** (1 cr, max 2). Oral presentation reqd for cr. Graded P/F. Prereq: perm.

Biol **555 Physiological and Molecular Genetics** (2-3 cr). Same as Genet 537. Prereq: Biol 351 or Genet 314.

BOTANY

Bot **241 Systematic Botany** (3 cr). Classification and identification of flowering plants; local flora. Two 1-hr lec and two 2-hr labs a wk; four 1-day field trips. Prereq: Biol 203 or perm.

Bot **311 Plant Physiology** (3 cr). Functions of plant growth and development. Prereq: Biol 203 and organic chem.

Bot **312 Plant Physiology Lab** (2 cr). Two 3-hr labs a wk. Prereq or coreq: Bot 311.

Bot **325 Morphology of Lower Plants** (4 cr). Structures, life history, classification, and phylogeny of fungi and algae. Two lec and two 3-hr labs a wk. Prereq: Biol 203.

Bot **364 Botany Microtechniques** (3 cr). Methods of treating plant tissues for microscopic exam or histochemical tests. Two 3-hr labs a wk. Prereq: Biol 203 or perm.

Bot **381 Mushroom Identification** (1 cr). Methods of mushroom study; emphasis on the natural history of higher basidiomycetes and ascomycetes of the Northwest. Two 2-hr lec-labs a wk for the first 8 wks; one 1-day field trip. Prereq: Biol 100 or 201 or 203.

Bot **382 Mold Identification** (1 cr). Methods and procedures for identifying filamentous fungi (phycomycetes, ascomycetes, fungi imperfecti) commonly found in soil, water, air, and decomposing organic matter. Two 2-hr lec-labs a wk for second 8 wks; two field trips. Prereq: course in biol.

Bot **J401/J510 Techniques of Plant Tissue Culture** (2 cr). Isolation and culture of higher plant cells, tissues, and organs. Two 3-hr labs a wk. Cr earned in Bot 510 by completion of special project and term paper. Prereq: perm.

Bot **J413/J515 Mineral Nutrition** (3 cr). Alt/yrs. Uptake and metabolism of mineral elements in higher plants. Two lec and one 2-hr disc a wk. Cr earned in Bot 515 by completion of term paper on mineral metabolism in higher plants. Prereq: Bot 311 and organic chem.

Bot **ID-J420/ID-J520 Aquatic Macrophytes** (1 cr). WSU Bot 420/520. Classification, structure, and habits of predominant aquatic macrophytes of Pacific NW. Cr earned in Bot 520 by completion of analytical term paper. Accelerated course with six hrs of lab a wk for first 8 wks; one 1-day field trip. Prereq: Biol 203; Bot 241 recommended.

Bot **ID-J421/ID-J521 Biology of Fungi** (2 cr). WSU Pl P 472. Life activity of fungi; structure, life history, and classification. Two lec and two 3-hr labs a wk. Cr earned in Bot 521 by exam of current literature and prep of term paper. Prereq: Biol 203 or perm.

Bot **ID-J422/ID-J522 Fungi in the Lab** (1 cr). WSU Pl P 473. Culture, experimentation, isolation, and morphology of fungi. Cr earned in Bot 522 by directing open-ended lab experiment.

Bot **J425/J525 Developmental Plant Anatomy** (3 cr). Origin and development of tissues and organs of vascular plants in relation to heredity, environment, and physiology. Cr earned in Bot 525 by completion of analytical term paper. Two lec and one 3-hr lab a wk. Prereq: Biol 203.

Bot **ID-J426/ID-J526 Morphology of the Embryophytes** (4 cr). WSU Bot 426. Structure, life history, classification, and phylogeny of liverworts, mosses, clubmosses, horsetails,

quillworts, ferns, and gymnosperms. Eight hrs a wk; one 1-day field trip. Cr earned in Bot 526 by completion of analytical term paper. Prereq: Biol 203.

Bot **J432/J530 Plant Ecology** (3 cr). General ecologic concepts and theory applied to plant populations and communities; intro to methods in plant ecology. Two lec and one 3-hr lab a wk; three 1-day field trips. Cr earned in Bot 530 by preparation of critical review of specific ecologic problem. Prereq: Biol 203, 331; Bot 241 recommended.

Bot **WS435 Plant Environmental Biophysics** (2 cr). WSU Soils 414.

Bot **WS436 Plant Environmental Biophysics Lab** (1 cr). WSU Soils 415.

Bot **J440/J540 Advanced Plant Taxonomy** (3 cr). Major classification systems, emphasis on flowering plants of world, their relationships, evolutionary trends, and morphological specializations. Credit earned in Bot 540 by completion of additional projects/assignments. Two 3-hr lec-labs a wk; one weekend field trip. Prereq: Bot 241 or equiv.

Bot **441 Agrostology** (3 cr). Classification, distribution, and structures of grasses. One lec and two 3-hr labs a wk; field labs and two 1-day field trips. Prereq: Biol 203 and Bot 241.

Bot **452 Principles of Plant Molecular Biology** (3 cr). Thorough intro to core topics of plant biotechnology and genetic engineering: methods for gene manipulation; organization, structure, and expression of genes in nucleus, chloroplasts and mitochondria of plants; methods and prospects for their engineering. Prereq: one semester of biochemistry and/or genetics.

Bot **474 Phycology** (4 cr). Morphology and ecology of fresh water and marine algae; principles of classification, collection, identification, and making of permanent microscopic prep. Prereq: Biol 203.

Bot **499** (s) **Directed Study** (cr arr). Prereq: perm.

Bot **500 Master's Research and Thesis** (cr arr).

Bot **501** (s) **Seminar** (cr arr). Prereq: perm.

Bot **502** (s) **Directed Study** (cr arr). Prereq: perm.

Bot **503** (s) **Workshop** (cr arr). Prereq: perm.

Bot **504** (s) **Special Topics** (cr arr). Prereq: perm.

Bot **510 Techniques of Plant-Tissue Culture** (2 cr). See Bot J401/J510.

Bot **512 Plant Growth Substances** (3 cr). Alt/yrs. Hormonal regulation of physiological processes. Two lec and one 2-hr disc a wk. Prereq: Bot 311 and organic chemistry.

Bot **515 Mineral Nutrition** (3 cr). See Bot J413/J515.

Bot **ID520 Aquatic Macrophytes** (1 cr). See Bot J420/J520.

Bot **ID521 Biology of Fungi** (2 cr). See Bot J421/J521.

Bot **ID522 Fungi in the Lab** (1 cr). See Bot J422/J522.

Bot **525 Developmental Plant Anatomy** (3 cr). See Bot J425/J525.

Bot **ID526 Morphology of the Embryophytes** (4 cr). See Bot J426/J526.

Bot **530 Plant Ecology** (3 cr). See Bot J432/J530.

Bot **535 Plant Geography** (3 cr). Alt/yrs. Same as Geog 525. Spatial relations of plants and plant communities as determined by intrinsic factors such as genetics and evolution, and extrinsic factors such as physiography, geology, climate, and climatic change; mechanisms of distribution, discontinuity patterns. One 3-day field trip. Prereq: Bot J432/J530 or perm.

Bot **539 Physiological Ecology** (3 cr). Physiological adaptations to various environmental and habitat conditions and their ecologic consequences. Two lec and one 3-hr lab a wk. Prereq: Bot J432/J530, 311 recommended.

Bot **540 Advanced Plant Taxonomy** (3 cr). See Bot J440/J540.

Bot **ID&WS556 Advanced Plant Molecular Biology** (3 cr). WSU GenCB 504. Molecular biology of plant organelles: structure of chloroplast and mitochondrial genomes and their replication; transcription, translation, and regulation of organelle genes and their interaction with nuclear genomes; genetic engineering of plant organelles-herbicide resistance, cytoplasmic male sterility. Prereq: one semester of biochemistry and/or genetics.

Bot **WS575 Basidiomycetes** (3 cr). WSU Pl P 522.

Bot **WS576 Ascomycetes and Fungi Imperfecti** (2 cr). WSU Pl P 523.

Bot **WS577 Lower Fungi** (2 cr). WSU Pl P 524.

Bot **600 Doctoral Research and Dissertation** (cr arr).

ZOOLOGY

Zool **119 Human Anatomy and Physiology** (5 cr). Three lec and two 2-hr recitation-labs a wk.

Zool **184 Bird Identification** (2 cr). Field and lab identification of birds. One 3-hr lec-lab a wk for second 8 wks; six 1-day field trips.

Zool **324 Comparative Vertebrate Anatomy** (4 cr). General vertebrate anatomy and evolutionary changes in organ systems. Two lec and two 3-hr labs a wk. Prereq: Biol 202.

Zool **366 Histological Technique** (2 cr). Methods of fixing, sectioning, staining, and mounting. Two 3-hr labs a wk. Prereq: Biol 202.

Zool **ID-J411/ID-J511 Comparative Vertebrate Reproduction** (3 cr). WSU Zool 451/551. Physiology of major events in reproductive cycles of vertebrates with emphasis on mammals. Cr earned in Zool 511 by completion of additional reading in journals, take-home exam with each hr exam, and term paper. Prereq: Biol 202.

Zool **412 Comparative Vertebrate Reproduction Lab** (2 cr). Lab study of the estrous cycle, pregnancy, and hormonal control of these events in rats. One 3-hr lab a wk. Prereq or coreq: Zool 411 or AnSc 452.

Zool **J414/J514 Cell Physiology** (3 cr). Experimental investigation of cells. Cr earned in Zool 514 by completion of research proposal. Prereq: organic chem, Biochem 380, and Biol 201; Biol 202 recommended.

Zool **415 Cell Physiology Lab** (2 cr). Current methodology to investigate a variety of functions in several eukaryotic cell types. Two 3-hr labs a wk.

Zool **416 Mammalian Physiology** (4 cr). Organs and organ systems of vertebrates; emphasis on mammals. Three lec and one 3-hr lab a wk. Prereq: Biol 202 and organic chem.

Zool **J417/J517 Endocrine Physiology** (3 cr). See AnSc J451/J551.

Zool **WS418 Parasitology** (4 cr). WSU Zool 417.

Zool **J423/J523 Comparative Vertebrate Physiology** (4 cr). Comparative physiology of the major organ systems found in vertebrates. Credit earned in Zool 523 by completion of additional projects/assignments. May involve some evening exams. Prereq: Biol 202 and organic chem.

Zool **427 Vertebrate Histology and Organology** (4 cr). Microscopic anatomy of tissues and major mammalian organs. Two lec and two 3-hr labs a wk. Prereq: Zool 119 or Biol 202.

Zool **J432/J532 Raptor Ecology** (2 cr). Identification, population dynamics, migration and food habits, energetics of North American birds of prey. Cr earned in 532 by completion of additional projects/assignments. One 4-day field trip. Prereq: Biol 331.

Zool **435 Limnology** (5 cr). See Fish 415.

Zool **J438/J538 Animal Geography** (2 cr). Zool 538 same as Geog 526. Dynamics of the distribution of animals in time and space. Cr earned in Zool 538 by completion of analytical term paper. Prereq: perm.

Zool **J472/J572 Developmental Biology** (3 cr). Analysis of developmental and regulatory mechanisms at cellular and molecular level during embryogenesis. Cr earned in Zool 572 by completion of additional reading, take-home exam, and term paper. Prereq: Biol 202.

Zool **473 Comparative Embryology Lab** (1 cr). Descriptive embryology of a number of organisms with emphasis on amphibians, birds, and mammals. One 3-hr lab a wk. Prereq or coreq: Zool J472/J572.

Zool **478 Animal Behavior** (3 cr). Evolution, causation, development, and function of behavior in vertebrates and invertebrates. Prereq: Biol 202.

Zool **481 Ichthyology** (4 cr). Same as Fish 411. Anatomy, taxonomy, physiology, distribution, and ecological relationships of fishes. Three lec and one 3-hr lab a wk; one half-day field trip. Prereq: Biol 202.

Zool **482 Natural History of Birds** (3 cr). Two lec and one 3-hr lab a wk; two 1-day field trips. Prereq: Biol 202.

Zool **483 Natural History of Mammals** (3 cr). Two lec and one 3-hr lab a wk. Prereq: Biol 202.

Zool **J484/J584 Invertebrate Zoology** (4 cr). Morphology of freshwater, marine, and terrestrial invertebrates and phylogeny of major groups. Cr earned in 584 by completion of extra project requiring a report. Two lec and two 2-hr labs a wk; one 6-day or two 2-day field trips. Prereq: Biol 202.

Zool **485 Freshwater Invertebrates** (2 cr). Collection, preserving, identification, slide preparation, and culturing of freshwater invertebrates not to incl insects, protozoans, or parasitic forms. Prereq: Biol 202.

Zool **ID&WS486 Marine Invertebrate Communities** (1 cr). WSU Zool 486. Six-day field trip to coast to study national history of marine invertebrates on rocky coast, mud flats, boat docks, and subtidal areas. Prereq: Biol 202.

Zool **489 Herpetology** (3 cr). Evolution, taxonomy, and biol of amphibians and reptiles. Two lec and one 3-hr lab a wk; one 4-day field trip and field labs. Prereq: Biol 202.

Zool **494 Insect Anatomy and Physiology** (4 cr). See Ent 484.

Zool **497 Practicum in Physical Therapy** (1 cr, max 4). Minimum of two hrs a wk of practical experience in a PT clinic. Graded P/F. Prereq: jr standing in pre-PT or related studies and perm.

Zool **499** (s) **Directed Study** (cr arr). Prereq: perm.

Zool **500 Master's Research and Thesis** (cr arr).

Zool **501** (s) **Seminar** (cr arr). Prereq: perm.

Zool **502** (s) **Directed Study** (cr arr). Prereq: perm.

Zool **503** (s) **Workshop** (cr arr). Prereq: perm.

Zool **504** (s) **Special Topics** (cr arr). Prereq: perm.

Zool **ID505 Generation, Degeneration, and Regeneration in Nervous System** (2 cr). WSU Zool 505.

Zool **ID511 Comparative Vertebrate Reproduction** (3 cr). See Zool J411/J511.

Zool **512 Environmental Physiology** (3-4 cr). Physiological responses of animals to natural changes or extremes of the physical environment. One 3-hr lab a wk if taken for 4 cr. Prereq: Zool 416.

Zool **513 Comparative Animal Physiology** (3 cr). Alt/yrs. Physiology, morphology, evolution, and ecology of various animal groups. Prereq: Zool 415 or 416.

Zool **514 Cell Physiology** (3 cr). See Zool J414/J514.

Zool **517 Endocrine Physiology** (3 cr). See Zool J417/J517.

Zool **523 Comparative Vertebrate Physiology** (4 cr). See Zool J423/J523.

Zool **ID532 Raptor Ecology** (2 cr). See Zool J432/J532.

Zool **538 Animal Geography** (2 cr). See Zool J438/J538.

Zool **572 Developmental Biology** (3 cr). See Zool J472/J572.

Zool **584 Invertebrate Zoology** (4 cr). See Zool J484/J584.

Zool **600 Doctoral Research and Dissertation** (cr arr).

Curricular Requirements

BIOLOGY (B.A. or B.S.)

Required course work includes the university requirements (see regulation J-3), the general requirements for either the B.A. or B.S. degree, and the following (electives to be chosen in consultation with the departmental adviser):

Course	Credits
Biol 101 Perspectives in Biology	1
Biol 201 Introduction to the Life Sciences	4
Biol 202 General Zoology	4
Biol 203 General Botany	4
Biol 331 General Ecology	3
Biol 351 General Genetics	3
Biol 352 Experimental Genetics	2
Biol 361 Biological Literature	1
Biol 442 Biological Evolution	3
Bact 250 General Microbiology	4
Bot 311, 312 Plant Physiology & Lab	5
Bot 425 Developmental Plant Anatomy	3
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
Chem 275, 276 Carbon Compounds & Lab	4
Math 140 Pre-calculus Algebra & Analytic Geometry	3
Phys 113-114-115-116 General Physics & Lab	8
Zool 324 Comparative Vertebrate Anatomy or 472, 473 Developmental Biology & Lab	4
Zool 414, 415 Cell Physiology & Lab or 423 Comparative Vertebrate Physiology	4-5
Zool 484 Invertebrate Zoology or Ent 211 General Entomology	4

BOTANY (B.A. or B.S.)

Required course work includes the university requirements (see regulation J-3), the general requirements for either the B.A. or B.S. degree, and the following (electives to be chosen in consultation with the departmental adviser):

Course	Credits
Bot 241 Systematic Botany	3
Bot 311, 312 Plant Physiology & Lab	5
Bot 421 Biology of Fungi	2
Bot 425 Developmental Plant Anatomy	3
Bot 426 Morphology of the Embryophytes	4
Bot 432 Plant Ecology	3
Biol 101 Perspectives in Biology	1
Biol 201 Introduction to the Life Sciences	4
Biol 202 General Zoology	4
Biol 203 General Botany	4
Biol 331 General Ecology	3
Biol 351 General Genetics	3
Biol 352 Experimental Genetics	2
Biol 361 Biological Literature	1
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
Math 140 Pre-calculus Algebra & Analytic Geometry	3

And completion of one of the two sections below:

A. FOR STUDENTS NOT PLANNING TO ATTEND GRADUATE SCHOOL

Chem 275, 276 Carbon Compounds & Lab	4
And at least one of the following:	
Math 160 Survey of Calculus	
Math 180 Analytic Geometry & Calculus I	
Stat 251 Principles of Statistics	

B. FOR STUDENTS PLANNING TO ENTER GRADUATE SCHOOL

Biochem 380 Introductory Biochemistry	3
Chem 277, 372 Organic Chemistry I, II	6
Chem 278 Organic Chemistry I Lab	1
Math 180 Analytic Geometry & Calculus I or Stat 251 Prin of Statistics	3-4
Phys 113-114-115-116 General Physics & Lab	8

ZOOLOGY (B.A. or B.S.)

Required course work includes the university requirements (see regulation J-3), the general requirements for either the B.A. or B.S. degree, and the following (electives to be chosen in consultation with the departmental adviser):

Course	Credits
Zool 324 Comparative Vertebrate Anatomy	4
Zool 414, 415 Cell Physiology & Lab or 423 Comparative Vertebrate Physiology	4-5
Zool 481 Ichthyology or 482 Natural History of Birds or 483 Natural History of Mammals or 489 Herpetology	3-4
Zool 484 Invertebrate Zoology or Zool 418 Parasitology or Ent 211 General Entomology	3-4
Biol 101 Perspectives in Biology	1
Biol 201 Introduction to the Life Sciences	4
Biol 202 General Zoology	4
Biol 203 General Botany	4
Biol 331 General Ecology	3
Biol 351 General Genetics	3
Biol 352 Experimental Genetics	2
Biol 361 Biological Literature	1
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
Chem 253 Quantitative Analysis	5
Chem 277, 278 Organic Chemistry I & Lab or 275, 276 Carbon Compounds & Lab	4
Chem 372 Organic Chem II or Biochem 380 Introductory Biochem	3
Math 140 Pre-calculus Algebra & Analytic Geometry	3
Math 160 Survey of Calculus or 180 Analytic Geometry & Calculus I	4
Phys 113-114-115-116 General Physics & Lab	8
Stat 251 Principles of Statistics	3
Approved upper-division biology or zoology electives	3-4

PRE-NURSING STUDIES

Admission to a school of nursing involves meeting satisfactorily its entrance requirements, acceptable scholastic records or a satisfactory score on the nursing admission test, and possession of personal qualifications essential for effective nursing. Requirements of the institution to which the student will transfer should be investigated by the student to ensure inclusion of courses that meet those requirements.

The following two-year program is suggested for students who plan to transfer to a school of nursing.

Course	Credits
Bact 250 General Microbiology or 154 Prin of Microbiology	3-4
Biol 201 Introduction to the Life Sciences	4
Chem 103 Introduction to Chemistry or 111 Principles of Chemistry	4
Chem 114 General Chemistry or 275, 276 Carbon Compounds & Lab	4
HEc 205 Concepts in Human Nutrition	3
Psych 100 Introduction to Psychology	3
Soc 110 Introduction to Sociology	3
Stat 251 Principles of Statistics	3
Zool 119 Human Anatomy & Physiology	5
Humanities and social sciences electives (at least 6 cr in each field)	21
Communications electives (3 cr must be in written communication)	6
Electives	2
Strongly recommended elective:	
Math 140 Pre-calculus Algebra & Analytic Geometry	3

PRE-PHYSICAL THERAPY STUDIES

UI does not have a professional program in physical therapy and does not offer a degree program in pre-physical therapy. However, a two-year nondegree program in pre-physical therapy studies is offered. The physical therapy adviser in the Department of Biological Sciences advises students interested in preparing to transfer to a professional program at another institution. Two basic plans of study lead to professional qualifications in physical therapy: (1) two to three years of study in a pre-physical therapy program for high school graduates and transfer students and (2) a four-year program leading to graduation with a baccalaureate degree. After completing either program, students will be eligible to transfer to professional programs in physical therapy leading to a bachelor or master of science degree in physical therapy.

Recommended Preparation

The courses listed below include most of the essential courses for transfer into a typical program.

Course	Credits
Biol 201 Introduction to the Life Sciences	4
Biol 202 General Zoology	4
Chem 111 Principles of Chemistry	4
Chem 114 General Chemistry	4
Eng 103, 104 Basic Skills & Essay Writing	6
Math 140 Pre-calculus Algebra & Analytic Geometry	3
Phys 113-114-115-116 General Physics & Lab	8
Psych 100 Introduction to Psychology	3
Psych 305 Developmental Psychology	3
Psych 311 Abnormal Psychology	3
Soc 110 Introduction to Sociology	3
Zool 119 Human Anatomy & Physiology	5
Humanities electives	3
Electives	14

Note: Students wishing to earn a bachelor's degree at UI before transferring into a certificate program in physical therapy may earn the degree in an allied area.

Academic Minor Requirements

BIOLOGY MINOR

Course	Credits
Biol 201 Introduction to the Life Sciences	4
Biol 202 General Zoology	4
Biol 203 General Botany	4
Biol 331 General Ecology	3
Biol 351 General Genetics	3
One of the following	4-5
Bot 311, 312 Plant Physiology & Lab	
Zool 119 Human Anatomy & Physiology	
Zool 414, 415 Cell Physiology & Lab	
Zool 423 Comparative Vertebrate Physiology	

BOTANY MINOR

Course	Credits
Bot 241 Systematic Botany	3
Bot 311, 312 Plant Physiology & Lab	5
Biol 201 Introduction to the Life Sciences	4
Biol 203 General Botany	4
Biol 331 General Ecology	3
Biol 351 General Genetics	3

ZOOLOGY MINOR

Course	Credits
Zool 324 Comparative Vertebrate Anatomy	4
Biol 201 Introduction to the Life Sciences	4
Biol 202 General Zoology	4
Course in animal physiology	3-4
One of the following	3-4
Biol 331 General Ecology	
Zool 481 Ichthology	
Zool 482 Natural History of Birds	
Zool 483 Natural History of Mammals	
Zool 484 Invertebrate Zoology	
Zool 489 Herpetology	

Department of Business

Byron J. Dangerfield, Dept. Head (338B Admin. Bldg.). Faculty: Ramona L. Anderson, C. Randall Byers, Raymond Dacey, Byron J. Dangerfield, Joseph J. Geiger, John H. Hallaq, Mark S. Johnson, Bradley D. Lockeman, Lawrence H. Merk, John S. Morris, Linda J. Morris, C. R. Narayanaswamy, Philip D. Olson, William H. Parks, Norman Pendegraft, Kathy L. Pettit, Steven W. Pharr, Mario G. Reyes, Dana L. Stover, Richard A. Toelle, Don G. Wardell.

The five major fields (finance, human resources management, information systems, marketing, and production/operations management) within the department lead to the B.S.Bus. degree. These programs provide a solid foundation in the liberal arts, a broad professional preparation in business, and in-depth course work in a major field. They are designed to prepare the student for a lifetime of continuing liberal and professional education.

The finance major prepares students for careers in commercial lending, security analysis, portfolio management, and corporate finance.

The human resources management major prepares students for opportunities in the areas of personnel administration, labor relations, and general management.

The information systems major prepares students in the areas of systems analysis, data base management, and systems marketing.

The marketing major prepares students for opportunities in a broad range of areas, including management of retail and wholesale distribution, advertising, and market research.

The production/operations management major prepares students for management positions in operations planning and control and in purchasing.

Business Courses

Note: Enrollment in 300- and 400-level business courses is restricted to students who have completed at least 58 credits. In addition, CBE students must have earned at least a 2.4 GPA in the CBE predictor courses.

No course (CBE or outside the college) that is required in a CBE student's major may be taken by CBE undergraduates on a P/F basis, with the exception of courses that are taught only on a P/F basis. Only upper-division CBE courses used as free electives may be taken by CBE undergraduates on a P/F basis.

Enrollment in 500-level business courses requires completion of listed prerequisites and permission of the graduate director of the College of Business and Economics.

Bus **101 Introduction to Business Enterprises** (3 cr). Not open to upper-division majors in the College of Business and Economics. Private enterprise system; marketing, management, finance, production; business-government relationships, organized labor, ethical and social responsibilities of business organizations.

Bus **200** (s) **Seminar** (cr arr).

Bus **204** (s) **Special Topics** (cr arr).

Bus **250 Microcomputer Software** (1 cr). Intro to microcomputers and to software packages useful in business applications such as word processing, data base management, and spreadsheet. Graded P/F. Prereq: CS 112.

Bus **299** (s) **Directed Study** (cr arr). Prereq: perm.

Bus **301 Financial Management** (3 cr). Policies and practices involved in acquisition, control, and allocation of financial resources in business organizations. May involve evening exams. Prereq: Acctg 201, Acctg 202, Stat 251, and Econ 152.

Bus **302 Intermediate Financial Management** (3 cr). Advanced course in managerial finance that addresses more complex issues such as risk in capital budgeting, working capital management, mergers, business failure and reorganization, and lease financing. May involve evening exams. Prereq: Bus 301, Acctg 300.

Bus **311 Introduction to Management** (3 cr). Organization, planning, leadership, and control; evolution of philosophies of management, decision making, motivation, human relations, and communication; organizational behavior and theory; history and present management practices, showing interrelationships between the needs and expectations of the individual, the organization, and society.

Bus **314 World of Corporate Business** (3 cr). Current key issues affecting large corporations including personal and professional development, corporate governance and takeovers, the role of profits, corporate culture and politics, ethical issues, human resources, social responsibility, government relations, the role and functions of a chief executive officer, and doing business in the international arena; course features senior corporate executives as weekly presenters. Prereq: jr standing.

Bus **321 Marketing** (3 cr) (C). Marketing institutions and relationships with economic, political, legal, and social environment; principles, functions, concepts, and issues of marketing within a firm and the relationship of marketing to other business disciplines. May involve evening exams.

Bus **324 Consumer Behavior** (3 cr). Behavioral science theories, concepts, and methods applied to the understanding and prediction of consumer behavior; emphasis on structuring marketing policy to fulfill consumer requirements. May involve evening exams. Prereq: Bus 321.

Bus **325 Retailing** (3 cr). Location, capital, and physical requirements; store organization, personnel, merchandise, and pricing; buying and receiving; sales promotion; customer services; retail expense mgt. May involve evening exams. Prereq: Bus 321.

Bus **327 Services/Nonprofit Marketing** (3 cr). Marketing principles applied to marketing of intangibles, societal issues, and to donors markets and publics for profit and nonprofit organizations; includes strategies for designing service layout and process, training of service providers, and other marketing mix elements to enhance customer satisfaction. Prereq: Bus 321.

Bus **332 Quantitative Methods in Business** (3 cr). Survey of management science techniques including constrained optimization and simulation; probability review, forecasting tech including time series analysis and decision theory. May involve evening exams. Prereq: Stat 251, Math 160 or 180, CS 112.

Bus **350 Management Information Systems** (3 cr). Data processing applications for business; intro to information systems; data base concepts; analysis, design, and implementation of computer-based information systems and consideration of associated problems. Prereq: CS 112, Acctg 202.

Bus **352 Computer Hardware and Software Concepts** (3 cr). Survey of technical topics related to computer systems; emphasis on relationship between hardware architecture, systems software, and application software; includes architecture of processors, storage systems, assemblers, loaders, compilers, and operating systems. Prereq: CS 112.

Bus **353 Introduction to Data Base** (3 cr). Intro to physical implementation of a data base under different logical data models; basic data structures, alternative file organizations, and models of data incl hierarchical, network, and relational; storage devices, data administration, and data analysis. Prereq: Bus 350.

Bus **355 Systems Analysis** (3 cr). Intro to principles of systems analysis and design of information systems; emphasis on Systems Development Life Cycle and modern tools of SAD. Prereq: Bus 350 and CS 112.

Bus **361 Real Estate** (3 cr). Listing, selling, leasing, financing, and brokerage; fundamentals of valuation and listing property management. This course has been certified by the Idaho Real Estate Commission.

Bus **370 Production/Operations Management** (3 cr). Intro to production/operations management, including product design, process design, facility layout, facility location, job design, work measurement, project management, quality control, inventory management, maintenance, and operations scheduling and control. May involve evening exams. Prereq: Bus 332 and either Math 160 or Math 180 (econ majors may substitute Econ 433 or Econ 436 for Bus 332).

Bus **399** (s) **Internship** (1-3 cr, max 6). Open only to majors in the Dept of Business. Graded P/F. Prereq: perm.

Bus **400** (s) **Seminar** (cr arr). Prereq: perm.

Bus **401 Investments** (3 cr). Functioning of financial markets; types of securities and their suitability to various investment goals. Prereq: Bus 301.

Bus **403 Insurance** (3 cr). Major branches of insurance; principles and practices.

Bus **404** (s) **Special Topics** (cr arr).

Bus **405 Portfolio Management** (3 cr). Security analysis and portfolio theory; financial futures; risk and return in investments. Prereq: Bus 401.

Bus **406 Problems in Financial Management** (3 cr). Analysis of selected topics in financial management problems; working capital management; capital budgeting and valuation; synthesis of financial management skills through case analysis; written and oral reports. May involve evening exams. Prereq: Bus 302.

Bus **407 Financial Institutions** (3 cr). Management and regulation of commercial and nonmonetary financial institutions including savings and loan institutions. Prereq: Bus 301, Econ 403.

Bus **408 Security Analysis** (3 cr). Emphasis on theory and practice of security analysis and investment timing. Prereq: Bus 302, Acctg 301.

Bus **409 Financial Theory** (3 cr). Theories and evidence for and against the six seminal and internally consistent theories on which modern finance is founded; utility theory; state-preference theory; mean-variance and capital asset pricing model; arbitrage pricing theory; option-pricing theory; and Modigliani and Miller theorems. Prereq: Bus 302.

Bus **412 Human Resource Management** (3 cr). Human resource/personnel management functions including recruitment, training, compensation, performance appraisal, health and safety, labor relations, and legal issues. Prereq: BLaw 265, Bus 311.

Bus **413 Organizational Behavior** (3 cr). Microoriented treatment of areas including communication, motivation, group process, conflict, leadership style. Prereq: Bus 311.

Bus **414 Entrepreneurship** (3 cr). Process of providing solutions to identified consumer needs; characteristics of individuals who succeed; sources of venture ideas; evaluating and developing ideas; business plans; franchising.

Bus **415 Small Business Management** (3 cr). Study of problems encountered by small business organizations through case analysis of actual small business operations; topics include location, staffing, financing, marketing, and growth. May involve field trips. Prereq: Bus 301, 311, and 321 or perm.

Bus **416 Staffing and Compensation** (3 cr). Specialized human resource management topics including selection, placement, and career development of employees; development and administration of monetary-nonmonetary reward programs, job evaluation systems, and wage incentive plans Prereq: Bus 412.

Bus **418 Organization Theory** (3 cr). Macro organization behavior; study of organization structure and processes; how environment, technology, and size impact structure and processes. Prereq: Bus 332, 413, Acctg 381.

Bus **420 Promotional Strategy** (3 cr) (C). Marketing management point of view; objectives, methods, strategies, budgets, and measures of effectiveness; campaign management including advertising, public relations, sales promotion, reseller support, personal selling. May involve evening exams. Prereq: Bus 321; prereq or coreq: Bus 324.

Bus **421 Marketing Research and Analysis** (3 cr). Applied research focusing on marketing information needs for managerial decision making; includes research design, data collection methods, statistical analysis, and use of marketing information systems to forecast market and sales potential, measure effectiveness of promotions, and analyze new products and distribution of goods and services. Prereq: Bus 321, 332.

Bus **422 Sales Force Management** (3 cr). Selecting, training, compensating, stimulating, supervising, and directing the selling efforts of an outside sales force; organization and method. May involve evening exams. Prereq: Bus 311, 321.

Bus **426 Marketing Channels Management** (3 cr). Analysis of planning, organization, and control issues related to distribution of goods and services; topics include retail and wholesale institutions, channel member behavior patterns, and vertical marketing systems. Prereq: Bus 321.

Bus **428 Marketing Problems** (3 cr). Theory and case studies of planning and problem solving in selecting target markets and integrating product, promotion, price, and channel decisions. Prereq: Bus 321, 324, 420, 421.

Bus **436 Economic and Business Forecasting** (3 cr). See Econ 436.

Bus **437 Statistics for Business Decisions** (2 cr). Same as Stat 437. Decision making under uncertainty; utility theory. Prereq: Stat 251.

Bus **439 Systems and Simulation** (3 cr). Distribution theory, random numbers, modeling concepts and simulation of queuing and inventory systems. Prereq: Bus 332, CS 112.

Bus **441 Labor Relations** (3 cr). Evolution, structure, and procedures of contemporary labor-management relations; unionization, other concerted activity and employment at will. Prereq: Bus 311.

Bus **453 Advanced Data Base** (3 cr). Intro to application program development in a database environment; storage devices and logical data organization including data administration and analysis, data design and data models with hierarchical network, relational, physical storage of data including addressing techniques, data structures, indexed and direct file organization, and secondary organization structures. Prereq: Bus 355.

Bus **454** (s) **Current Issues in Information Systems** (3 cr, max arr). Discussion of major topics of current importance in information systems. Prereq: Bus 350 and perm.

Bus **455 Systems Design** (3 cr). Intro to principles of information systems design; continuation of Systems Development Life Cycle begun in Bus 355 emphasizing modern methods of systems design; use of state of the art systems development software. Prereq: Bus 353, 355.

Bus **456 Quality Control** (3 cr). Same as Stat 456. Quality control from a managerial perspective; designing of efficient and effective systems for the maintenance of quality. May involve field trips. Prereq: Stat 251 or 301, Math 160 or 180.

Bus **462 Real Property Appraisal** (3 cr). Theories and principles in estimating value of natural resources and any attached improvements. This course has been certified by the Idaho Real Estate Commission. Prereq: Bus 361, Econ 152 or perm.

Bus **470 Purchasing and Materials Management** (3 cr). Overview of materials management function in organizations; includes consideration of purchasing, logistics, and inventory management. Prereq: Bus 370.

Bus **472 Operations Planning and Scheduling** (3 cr). In-depth study of planning and scheduling techniques with emphasis on material requirements planning. May involve field trips. Prereq: Bus 332, 370.

Bus **474 International Business** (3 cr). International trade and the nature of exchange among nations; socioeconomic environment of the multinational corporation.

Bus **475 International Marketing** (3 cr). Alt/yrs. Foreign market operations; economic, cultural, and political aspects of international markets and how they interact with the marketing mix. Prereq: Bus 321.

Bus **478 Problems in Operations Management** (3 cr). Emphasis on case method as a vehicle for analyzing problems and situations faced by operations managers; draws on knowledge gained from course work or experience in such areas as personnel, quality control, finance, marketing economics, and accounting. Prereq: Bus 370.

Bus **480 Business Policy** (3 cr). Culminating program of study in business administration; designed to integrate all area skills acquired during previous formal study; integration of skills through case analysis and other methods; written and oral reports. Prereq: Bus 301, 311, 321, Eng 313, and sr standing.

Bus **499** (s) **Directed Study** (cr arr). Prereq: perm.

Bus 501 (s) Seminar (cr arr). Normally offered in real estate, investments, insurance, governmental regulation, industrial management, industrial relations, and current problems. Prereq: perm.

Bus **502** (s) **Directed Study** (cr arr). Prereq: perm.

Bus **503 Financial Policy** (3 cr). Social and economic implications of the financial process. Prereq: Bus 301 and perm.

Bus **504** (s) **Special Topics** (cr arr).

Bus **505** (s) **Workshop** (cr arr). Prereq: perm.

Bus **513 Human Behavior in Organizations** (3 cr). Seminar concerned with worker and supervisor behavior and attitudes, work group behavior, leadership and motivation, communication and decision making. Prereq: Bus 311 and perm.

Bus **521 Marketing Management** (3 cr). Production development, pricing, demand creation, physical distribution, and channel selection. Prereq: Bus 321 and perm.

Bus **525 Industrial Management** (3 cr). Techniques of and decision making in production management; quantitative approaches of resource allocation to problems of production. Prereq: perm.

Bus **532 Quantitative Techniques** (3 cr). Applications of math decision-making techniques to business problems; topics include decision theory, math modeling, linear programming, simulation tech. Prereq: Stat 251 and perm.

Bus **541 Labor Relations** (3 cr). Structure and procedures of contemporary labor-management relations in presence and absence of unions. Prereq: Bus 311 and perm.

Bus **572 Operations Planning and Scheduling** (3 cr). See Bus 472 for description.

Bus **580 Business Policy** (3 cr). Integration of administrative/management concepts, techniques, and models for both line/staff (cases); organization goals, policies, strategies through case analysis. Prereq: perm.

Bus **597** (s) **Practicum** (cr arr). Prereq: perm.

Bus **598** (s) **Internship** (cr arr). Prereq: perm.

Bus **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Curricular Requirements

FINANCE (B.S.Bus.)

Required course work includes the university requirements (see regulation J-3), the college requirements, and:

Course	Credits
Acctg 300 Accounting Concepts & Systems	3
Acctg 301 Financial Accounting & Reporting I	3
Bus 302 Intermediate Financial Management	3
Bus 401 Investments	3
Bus 406 Problems in Financial Management	3
Bus 407 Financial Institutions	3
Econ 403 Money & Banking (may be used to fulfill college core economics requirements)	3
One course selected from the following	3
Bus 404 Special Topics	
Bus 405 Portfolio Management	
Bus 408 Security Analysis	
Bus 409 Financial Theory	

One course selected from the following....3
- Bus 421 Marketing Research & Analysis
- Econ 433 Introduction to Econometrics
- Econ 436 Economic & Business Forecasting
- Stat 401 Statistical Analysis

Additional course chosen from the above lists or the following....3
- Acctg 302 Financial Accounting & Reporting II
- Acctg 330 Accounting for Public Sector Organizations
- Acctg 385 Cost & Management Accounting
- Acctg 401 Financial Accounting & Reporting III
- Bus 327 Services/Nonprofit Marketing
- Econ 321 Intermediate Microeconomic Analysis
- Econ 409 Public Finance
- Econ 410 State & Local Government Finance

HUMAN RESOURCES MANAGEMENT (B.S.Bus.)

Required course work includes the university requirements (see regulation J-3), the college requirements, and:

Course	Credits
Acctg 381 Financial & Administrative Accounting	3
Bus 412 Human Resource Management	3
Bus 413 Organizational Behavior	3
Bus 416 Staffing & Compensation	3
Bus 418 Organization Theory	3
Bus 441 Labor Relations	3
One course selected from the following	3
Bus 414 Entrepreneurship	
Bus 415 Small Business Management	
Bus 422 Sales Force Management	
Econ 441 Labor Economics (may be used to fulfill college core economics requirements)	
One course selected from the following	3
CommG 331 Conflict Management	
CommG 332 Communication & the Small Group	
CommG 335 Organizational Communication	
Psych 316 Industrial Psychology	
Psych 320 Introduction to Social Psychology	

INFORMATION SYSTEMS (B.S.Bus.)

Required course work includes the university requirements (see regulation J-3), the college requirements (IS majors must take CS 112 rather than 100), and:

Course	Credits
Acctg 300 Accounting Concepts & Systems or Acctg 381 Financial & Administrative Accounting	3
Bus 352 Computer Hardware & Software Concepts	3
Bus 353 Introduction to Data Base	3
Bus 355 Systems Analysis	3
Bus 453 Advanced Data Base	3
Bus 455 Systems Design	3
Courses selected from the following or other approved electives	9
Acctg 385 Costs & Management Accounting	
Bus 418 Organization Theory	
Bus 437 Statistics for Business Decisions	
Bus 439 Systems & Simulation	
Bus 454 Current Issues in Information Systems	
Bus 472 Operations Planning & Scheduling	
CS 310 Computing Languages	
CS 334 Advanced COBOL Programming	
CS 471 Expert Systems	
Math 326 Linear Programming	
ME 409 Human Factors in Engineering Design	

MARKETING (B.S.Bus.)

Required course work includes the university requirements (see regulation J-3), the college requirements, and:

Course	Credits
Bus 324 Consumer Behavior	3
Bus 420 Promotional Strategy	3
Bus 421 Marketing Research & Analysis	3
Bus 422 Sales Force Management	3
Bus 428 Marketing Problems	3
Electives (at least one chosen from the following)	3
Bus 325 Retailing	
Bus 327 Services/Nonprofit Marketing	
Bus 475 International Marketing	
Additional course chosen from the above list or the following	3
Bus 414 Entrepreneurship	
Bus 415 Small Business Management	
Bus 470 Purchasing & Materials Management	
Comm 352 Principles of Public Relations	
Comm 431 Professional Presentation Techniques	

PRODUCTION/OPERATIONS MANAGEMENT (B.S.Bus.)

Required course work includes the university requirements (see regulation J-3), the college requirements, and:

Course	Credits
Acctg 381 Financial & Administrative Accounting	3
Bus 413 Organizational Behavior	3
Bus 418 Organization Theory	3
Bus 441 Labor Relations	3
Bus 456 Quality Control	3
Bus 470 Purchasing & Materials Management	3
Bus 472 Operations Planning & Scheduling	3
Bus 478 Problems in Operations Management	3
ME 253 Materials Processing	3

BUSINESS EDUCATION—see Division of Vocational Teacher and Adult Education

BUSINESS LAW—see Department of Accounting

Department of Chemical Engineering

Roger A. Korus, Dept. Chair (312 Buchanan Engr. Lab.). Faculty: Thomas E. Carleson, David C. Drown, Louis L. Edwards, Jr., Roger A. Korus, Jin Y. Park, Jay J. Scheldorf, George M. Simmons, Margrit von Braun.

Chemical engineering combines the science of chemistry with the discipline of engineering in order to solve problems and to increase process efficiency. One of the most attractive aspects of a chemical engineering future is the variety of work available. Chemical engineering is a blend of physics, chemistry, and mathematics; thus, a chemical engineer possesses a versatility that gives him or her many opportunities for employment in fields such as pulp and paper, environmental engineering, food products, nuclear power, petroleum, and petrochemicals, semiconductors, synthetic fuels, radioisotope applications, plastics and polymers, pharmaceuticals, education, biomedical engineering, computer applications, alternate energy sources, steel, and textiles. A chemical engineer can choose work in any of the following areas: research and development, design and construction, operations, management, teaching, or technical sales.

With the ever-increasing need for alternative energy sources and consumer products, coupled with environmental awareness and a decreasing supply of raw materials, the demand for chemical engineers will remain high.

The faculty of the Department of Chemical Engineering is dedicated to excellence in teaching. It is the faculty's goal to provide the students with a strong, well-rounded background for immediate entry into the industrial workforce or for graduate study. This background includes the theoretical aspects of chemical engineering as well as practical work experiences. Thus, most of the equipment that is installed in the Chemical Engineering laboratory is on the scale of pilot plant equipment. Because much of the equipment is made of glass, students are able to see at a glance what processes occur and where the streams are flowing. The department has a two-story distillation column, a gas absorber, two types of evaporators, a two-stage chemical reactor, and a spray dryer. All of this equipment is used by undergraduate students. Proof that the departmental goals are being achieved is in the job-placement statistics for chemical engineers from UI. Most receive numerous job offers and many graduates now hold high-level technical and management positions in industry, government, and academia.

The department has available a number of fellowships and assistantships for students. Support includes fellowships from the Potlatch Foundation, Weyerhaeuser Company, Crown Zellerbach, and Lamb Weston; UI graduate assistantships; and research assistantships.

The graduate program in chemical engineering also includes provisions for study leading to a master's degree in chemical engineering for students who have a B.S. degree in a related field. This program requires that the student enroll for at least one trial semester as an undergraduate student in chemical engineering.

Chemical Engineering Courses

ChE **204** (s) **Special Topics** (cr arr).

ChE **223 Material and Energy Balances** (3 cr). Conservation of mass and energy calculations in chemical process systems. Prereq: Chem 114, Math 190.

ChE **299** (s) **Directed Study** (cr arr). Prereq: perm.

ChE **323 Reactor Kinetics and Design** (3 cr). Chemical reaction equilibria, rates, and kinetics; design of chemical and catalytic reactors. Prereq: ChE 223, Math 310.

ChE **330 Stagewise Operations** (3 cr). Stagewise operations, including distillation, extraction, ion exchange, absorption. Prereq: ChE 223, ES 321, Chem 305.

ChE **393 Chemical Engineering Projects** (1-3 cr, max 9). Problems of a research or exploratory nature. Prereq: perm of dept.

ChE **404** (s) **Special Topics** (cr arr).

ChE **410 Fundamentals of Polymer Science and Processing** (3 cr). Structure and formation of polymers, polymerization and fabrication process and properties. Prereq: perm.

ChE **415 Integrated Circuit Fabrication** (3 cr). Growth of semiconductor crystals, microlithography, and processing methods for integrated circuit fabrication. Prereq: ChE 223.

ChE **430-431-432 Transport and Rate Processes I-II-III** (3 cr; 2 cr; 3 cr). Transport phenomena involving momentum, energy, and mass with applications to process equipment design. Coordinated lec-lab periods. ChE 430-431-432 are to be taken in sequence. Prereq for 430: ChE 223, ES 320, ES 321, Math 310.

ChE **433 Chemical Engineering Lab** (2 cr). Lab experiments in chemical engineering. Prereq or coreq: ChE 431.

ChE **435 Energy Conversion Systems** (3 cr). Energy sources and their conversion to useful power; includes conversion systems and association economics; nuclear fission, fusion, and radiation; geothermal; thermionic and fossil fuels.

ChE **444 Process Analysis and Control** (3 cr). Process modeling, dynamics, and analysis. Prereq: ChE 223, Math 310.

ChE **445 Digital Process Control** (3 cr). Same as EE 477. Dynamic simulation of industrial processes and design of digital control systems. Two lec and one 3-hr lab a wk. Prereq: ChE 444 (prereq for EE majors: EE 350).

ChE **453-454 Chemical Process Analysis and Design** (3 cr). Estimation of equipment and total plant costs, annual costs, indices of attractiveness, optimization; design of equipment, alternate process systems and economics, case studies of selected processes. One 1-wk field trip. Prereq: ChE 330, Econ 151; coreq: ChE 323, 431.

ChE **460 Biochemical Engineering** (3 cr). Appl of chemical engineering to biological systems including fermentation processes, biochemical reactor design, and biological separation processes.

ChE **470 Hazardous Waste Management and Treatment** (3 cr). Legislation and regulation of hazardous waste, management alternatives, and treatment processes. Prereq: perm.

ChE **ID&WS-J475/ID&WS-J575 Air Pollution Control** (2-3 cr). WSU C E 508. Analysis and design of physical and chemical methods of air pollution control; particulate and gas emission control methods, standards for sources. Additional projects/assignments reqd for grad cr. Prereq: ES 320 or perm.

ChE **491 Seminar** (1 cr). Recent developments and topics. Graded P/F. Prereq: sr standing.

ChE **499** (s) **Directed Study** (cr arr). Prereq: perm.

ChE **500 Master's Research and Thesis** (cr arr).

ChE **501** (s) **Seminar** (cr arr). Prereq: perm.

ChE **502** (s) **Directed Study** (cr arr). Prereq: perm.

ChE **504** (s) **Special Topics** (cr arr).

ChE **ID&WS515 Transport Phenomena** (3 cr). Same as ME 515. WSU Ch E 510. Advanced treatment of momentum, energy, and mass transport processes; solution techniques. Prereq: perm.

ChE **WS523 Basic Concepts in Catalysis** (2 cr). WSU Ch E 523.

ChE **WS524 Polymer Reactor Engineering** (3 cr). WSU Ch E 525.

ChE **525 Advanced Heat Transfer** (3 cr). Same as ME R525. Application of fundamentals of heat conduction, radiation, and convection; relationships to fluid dynamics and mass transfer; economics and design application. Prereq: perm.

ChE **ID&WS527 Advanced Chemical Engineering Thermodynamics** (3 cr). WSU Ch E 527. Equilibria in physical and chemical systems; generalized prediction of thermodynamic properties, includes nonideal systems. Prereq: perm.

ChE **R528 Advanced Thermodynamics** (3 cr). See ME 528.

ChE **ID&WS529 Chemical Engineering Kinetics** (3 cr). WSU Ch E 529. Interpretation of kinetic data and design of reactors for heterogeneous chemical reaction systems; heterogeneous catalysis, gas-solid reactions, gas-liquid reactions; packed bed reactors, fluidized bed reactors. Prereq: perm.

ChE **537 Advanced Fluid Mechanics** (2-3 cr). Same as ME 537. Fluid systems used in industry; non-Newtonian behavior of particle and plastic systems; two-phase situations, including fluidization and film flow. Prereq: perm.

ChE **541 Chemical Engineering Analysis I** (3 cr). Same as ME 541. Math analysis of chemical engineering operations and processes; math modeling and computer applications. Prereq: perm.

ChE **ID&WS542 Chemical Engineering Analysis II** (3 cr). WSU Ch E 542. Numerical and analytical methods in the solution of chemical engineering problems; partial differential equations, application of approximate variational methods and integral transforms. Prereq: perm.

ChE **544 Advanced Process Control** (3 cr). Theory of process dynamics and systems engr. Two lec and one 3-hr lab a wk. Prereq: perm.

ChE **ID&WS545-ID&WS546 Mass Transfer Operations I-II** (3 cr). WSU Ch E 546. Diffusional and equilibrium operations. Prereq: perm.

ChE **WS551 Discrete Digital Control** (3 cr). WSU Ch E 551.

ChE **ID&WS560 Biochemical Engineering** (3 cr). WSU Ch E 560. Application of chemical engineering to biological systems including fermentation processes and biochemical reactor design, transport phenomena in biological systems and biochemical technology.

ChE **ID571 Advanced Plant Design** (3 cr). WSU Ch E 571. Design of process plants for optimum costs and economic return; scale-up of pilot plants. Prereq: perm.

ChE **ID&WS575 Air Pollution Control** (2-3 cr). See ChE J475/J575.

ChE **578 Treatment of Hazardous Chemical Waste** (3 cr). Design of alternative processes and operations for treatment of hazardous chemicals. Prereq: Math 310 and ChE 432 or CE 431.

ChE **579 Hazardous Waste Site Remediation Design** (3 cr). Same as Hydro 579. Characterization of hazardous waste sites, identification of physical, chemical, and biological corrective action programs and site restoration; includes design problems and case studies to illustrate corrective action and site restoration in compliance with regulations. Prereq: Geol 409 and ES J475/J575.

ChE **600 Doctoral Research and Dissertation** (cr arr).

Curricular Requirements

CHEMICAL ENGINEERING (B.S.Ch.E.)

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
Courses common to engineering curricula (see part 4)	38
ChE 223 Material & Energy Balances	3
ChE 323 Reactor Kinetics & Design	3
ChE 330 Stagewise Operations	3
ChE 430-431-432 Transport & Rate Processes I-II-III	8
ChE 433 Chemical Engineering Lab	2
ChE 444 Process Analysis & Control	3
ChE 445 Digital Process Control	3
ChE 453-454 Chemical Process Analysis & Design	6
ChE 491 Seminar	1
Chem 277, 278 Organic Chemistry I & Lab	4
Chem 305, 307 Physical Chemistry & Lab	4
Chem 372, 374 Organic Chemistry II & Lab	4
Econ 151 Principles of Economics	3
EE 207 Introduction to Electrical Engineering	3
ES 320 Fluid Mechanics	3
ES 321 Thermodynamics & Heat Transfer	3
Chemical engineering electives	3
Chemical/bioscience electives	4
Engineering electives	3
Humanities and social sciences electives incl at least (1) one upper-div course or (2) a course that has another humanities/social sc course as a prereq	13
Communication electives	2
Mathematics electives	3
Technical electives	3
Undesignated electives	3

Department of Chemistry

Peter R. Griffiths, Dept. Chair (116 Malcolm M. Renfrew Hall). Faculty: Thomas E. Bitterwolf, James H. Cooley, Leszek Czuchajowski, W. Daniel Edwards, Sherry O. Farwell, T. Rick Fletcher, Peter R. Griffiths, Sharon J. Hutchison, Henrik D. Juve, Robert L. Kirchmeier, Duane J. LeTourneau, Jeanne L. McHale, Nicholas R. Natale, Jean'ne M. Shreeve, Ray von Wandruszka, Chien M. Wai, Richard V. Williams.

Chemistry is the central science—the foundation on which a variety of applied and nonapplied disciplines build. Chemistry deals with the composition, structure, and properties of substances and the changes they undergo. It is the study of the materials of which the entire universe is composed. Chemistry graduates will find an impressive array of options and exciting opportunities in fields such as basic research, environmental protection, instrumentation, new product and process development, technical marketing, market research, forensic chemistry, teaching at all levels, and information

science. Moreover, an education in chemistry is valuable in health sciences such as medicine, pharmacology, clinical chemistry, and industrial hygiene. It can be useful as well in nontechnical areas such as advertising, journalism, patent law, banking, and investment counseling. The options are bounded only by the limits of one's imagination.

There are four distinct undergraduate curricula designed to meet a wide range of professional needs. The general chemistry curriculum leading to the B.S. degree provides a suitable foundation in chemistry for aspiring secondary-school teachers or for medicine. Even so, this is a subminimal curriculum for students who wish to become professional chemists. The professional curriculum (B.S.) is strongly recommended for students who are interested in practicing chemistry as a career, including graduate study for an advanced degree in chemistry or a related field. The degree is certifiable to the American Chemical Society. For those interested in information science, the technical literature curriculum (B.S.) provides adequate preparation. The combination of chemistry with marketing or business can be accomplished via the B.Tech. degree, which gives an excellent foundation for a successful career in sales or business.

Students majoring in chemistry at UI have the very good fortune to interact with an award-winning, distinguished teaching faculty. They have a unique opportunity to participate in undergraduate research in a nurturing environment where they work side by side with graduate students, postdoctoral fellows, and faculty members. Very often the research carried out by undergraduates results in publications in leading chemical journals. As a result of the strong research programs in the department, undergraduates have the opportunity in their courses to have hands-on experience with, or to acquire data from, modern sophisticated instrumentation such as FT nuclear magnetic resonance, gas chromatographs interfaced with mass spectrometers, and laser Raman, infrared and ultraviolet spectrometers, in addition to the more classical techniques. Considerable use of computers is made in laboratory courses and as an aid to instruction. Because our B.S. students receive first-class training, they are in demand by prospective employers and graduate schools.

The Department of Chemistry offers graduate study leading to the degrees of Master of Science (thesis and nonthesis options), Master of Arts in Teaching, and Doctor of Philosophy. Concentrations within the major in chemistry are permitted in analytical, inorganic, organic, and physical chemistry. Students who intend to work for a graduate degree in chemistry should prepare by completing the professional B.S. degree. Courses in mathematics, physics, German or Russian, computer science, and chemistry in addition to those required for that degree are strongly recommended. All students entering any of the graduate programs in chemistry are required to demonstrate proficiency in chemistry by taking a series of examinations in analytical, inorganic, organic, and physical chemistry that have questions at the advanced undergraduate level. Undergraduates are encouraged to discuss graduate school and career opportunities with the head of the department or with chemistry faculty members early in their residency at UI.

Chemistry Courses

RELATED FIELD: See biochemistry.

ADVANCED PLACEMENT: Courses in this subject field that are vertical in content are: 111-112-253, 111-114; 103-275.

Chem **050 Chemistry Fundamentals** (0 cr). Accelerated treatment of chemical problem solving, including SI unit conversion, mole concept, specific heat, specific gravity, chemical stoichiometry, and solution concentration problems. Graded P/F.

Chem **101 Chemistry and the Citizen** (4 cr). Satisfies core requirement J-3-b. Not acceptable as a substitute where Chem 103, 111, or equiv is specified. Cr may be earned in only one of the following: Chem 101, 103, 111. Nonmathematical descriptive treatment relating key developments of chemistry to modern living. Three lec, dem, and one 2-hr lab a wk.

Chem **103 Introduction to Chemistry** (4 cr). Satisfies core requirement J-3-b. Cr may be earned in only one of the following: Chem 101, 103, 111. General treatment of the fundamentals of chemistry. Three lec, one recitation, and one 3-hr lab a wk. Does not satisfy the prereq for Chem 112 or 114. Prereq or coreq: Chem 050 or adequate score on chemistry-fundamentals exam.

Chem **111 Principles of Chemistry** (4 cr). Satisfies core requirement J-3-b. Cr may be earned in only one of the following: Chem 101, 103, 111. Intensive treatment of principles and applications of chemistry. Three lec, one recitation, and one 3-hr lab a wk. Prereq or coreq: Chem 050 or adequate score on chemistry-fundamentals exam.

Chem **112 Inorganic Chemistry and Qualitative Analysis** (5 cr). Satisfies core requirement J-3-b. Elem theoretical chemistry and applications to analytical practice; lab work in the qualitative separation of cations and anions by semimicro methods. Max six cr in Chem 112 and 114 combined. Three lec and two 3-hr labs a wk. Prereq: Chem 111 or perm.

Chem **114 General Chemistry** (4 cr). Satisfies core requirement J-3-b. Continuation of Chem 111 for students who do not plan to take further professional chemistry courses. Some work in inorganic, organic, and biochemistry, electrochemistry, nuclear chemistry, and in qualitative inorganic analysis. Max six cr in Chem 112 and 114 combined. Three lec, one recitation, and one 3-hr lab a wk. Prereq: Chem 111 or perm.

Chem **121 Glassblowing** (1 cr). Techniques used in constructing scientific apparatus and artistic objects from glass. Graded P/F. One 3-hr lab a wk.

Chem **200** (s) **Seminar** (cr arr). Prereq: perm.

Chem **204** (s) **Special Topics** (cr arr).

Chem **253 Quantitative Analysis** (5 cr). Fundamental principles and techniques of chemical analysis; intro to sampling, standardization, data evaluation, gravimetric/volumetric methods, and instrumental techniques. Three lec and two 3-hr labs a wk. Prereq: Chem 112 or 114.

Chem **275 Carbon Compounds** (3 cr). Aspects of organic chemistry important to students in the life sciences. Duplicate cr will not be allowed in first-year courses in organic chemistry. Prereq: Chem 103 or perm.

Chem **276 Carbon Compounds Lab** (1 cr). Lab to accompany Chem 275; for students who need only 1 cr of lab. One 3-hr lab a wk. Prereq or coreq: Chem 275 or 277.

Chem **277 Organic Chemistry I** (3 cr). Principles and theories of organic chemistry; properties, preparation, and reactions of organic compounds. Duplicate cr will not be allowed in first-year courses in organic chemistry. Prereq: Chem 112 or 114.

Chem **278 Organic Chemistry I: Lab** (1 cr). One 3-hr lab a wk. Prereq or coreq: Chem 277.

Chem **299** (s) **Directed Study** (cr arr). Prereq: perm.

Chem **302 Principles of Physical Chemistry** (3 cr). Emphasis on topics important to biological and agricultural science. Prereq: Chem 112 or 114, Math 180, Phys 113, or perm.

Chem **303 Principles of Physical Chemistry Lab** (1 cr). Lab to accompany Chem 302. One 3-hr lab a wk. Prereq or coreq: Chem 302.

Chem **305-306 Physical Chemistry** (3 cr). Kinetic theory, thermodynamics, quantum mechanics, and spectroscopy. Prereq: Chem 112 or 114, Math 200; prereq or coreq: Phys 211 or 222.

Chem **307-308 Physical Chemistry Lab** (1 cr). Lab to accompany Chem 305-306. One 3-hr lab a wk. Prereq or coreq: Chem 305-306.

Chem **J318/J418 Environmental Chemistry** (3 cr). Basic atmospheric chemistry and biogeochemistry; factors that influence this chemistry; current global, national, and state environmental problems. Registration for Chem 418 requires additional project. Prereq: Chem 253, 275 or 277, or perm.

Chem **372 Organic Chemistry II** (3 cr). Continuation of Chem 277. Prereq: Chem 277.

Chem **374 Organic Chemistry Lab for Engineers** (1 cr). For students in engineering. Lab to accompany Chem 372; includes synthesis, structure determination, and mechanisms. One 3-hr lab a wk. Prereq: Chem 278; prereq or coreq: Chem 372.

Chem **376 Organic Chemistry II: Lab** (2 cr). Lab to accompany Chem 372, includes qualitative analysis and modern instrumental techniques. Two 3-hr labs a wk. Prereq: Chem 278; prereq or coreq: Chem 372.

Chem **400** (s) **Seminar** (cr arr). Prereq: perm.

Chem **404** (s) **Special Topics** (cr arr).

Chem **409 Proseminar** (1 cr). Current publications in chemistry and chemical engineering with reports on typical scientific papers. Prereq: Chem 372 and sr standing.

Chem **R413 Radiochemistry for Engineers** (2 cr). Primarily for engineers. Properties of nuclear particles, nuclear reactions, techniques of producing reactions, interaction of radiation with matter, and radiochemistry techniques. Prereq: perm.

Chem **416 Methods in Radiochemistry** (3 cr). Basic theory and practice in use of radionuclides; practical lab experience. Two lec and one 3-hr lab a wk. Enrollment is limited by facilities. Prereq: Chem 306 or perm.

Chem **418 Environmental Chemistry** (3 cr). See Chem J318/J418.

Chem **J435/J535 Principles of Chemical Instrumentation** (4 cr). Practical theory and appl of modern analog/digital electronics and small computers to chemical measurement and control systems. Registration for Chem 535 requires completion of an additional termpaper or other assignment. Three hrs of lec and one 3-hr lab a wk. Prereq: Chem 253, Phys 211, or perm.

Chem **441 Chemical Literature** (1 cr). Survey of important chemistry reference works and periodicals; use of these sources. Prereq: perm.

Chem **454 Instrumental Analysis** (4 cr). For students in chemistry and allied fields. Techniques in operating new and specialized instruments for qualitative and quantitative

analysis and analytical methods of an advanced nature. Three lec and one 4-hr lab a wk. Prereq: Chem 253, 305; prereq or coreq: Chem 306.

Chem **455 Survey of Analytical Chemistry** (3 cr). Fundamentals of modern analytical chemistry. Open only to chemistry M.S. and Ph.D. students. Cr is not allowed in both Chem 454 and 455. Prereq: Chem 306 and perm.

Chem **463-J464/J564 Inorganic Chemistry** (3 cr). Principles, complex ions and coordination compounds, theory of acids and bases, bonding theory, non-aqueous solvents, familiar elements and their relationship to the periodic table. Additional projects/assignments reqd for grad cr. Prereq: Chem 305; prereq or coreq: Chem 306 or perm.

Chem **465 Inorganic Chemistry Lab** (1 cr). Lab to accompany Chem 463. One 3-hr lab a wk. Coreq: Chem 463.

Chem **466 Survey of Inorganic Chemistry** (3 cr). Fundamentals of modern inorganic chemistry. Open only to chemistry M.S. and Ph.D. students. Cr is not allowed in both Chem 463 and 466. Prereq: Chem 306 and perm.

Chem **473 Intermediate Organic Chemistry** (3 cr). Theories and mechanisms of organic chemistry. Prereq: Chem 372; prereq or coreq: Chem 306.

Chem **475 Organic Synthesis** (3 cr). Strategy of organic synthesis applied to the lab synthesis of reactive organic intermediates. One lec and six hrs of lab a wk. Prereq: Chem 376 or perm.

Chem **476 Survey of Organic Chemistry** (3 cr). Fundamentals of modern organic chemistry. Open only to chemistry M.S. and Ph.D. students. Cr is not allowed in both Chem 473 and 476. Prereq: Chem 306 and perm.

Chem **J481-J482/J541-J542 Biochemistry** (3 cr). See Biochem J481-J482/J541-J542.

Chem **483-484 Biochemistry Lab** (2 cr). See Biochem 483-484.

Chem **486 Plant Biochemistry** (3 cr). See Biochem 486.

Chem **491** (s) **Research** (1-6 cr, max 6). Submission of a report of the research done for placement in the permanent dept files is required. Prereq: perm of dept.

Chem **495 Thermodynamics and Kinetics** (3 cr). Prereq: Chem 306 or equiv.

Chem **496 Survey of Physical Chemistry** (3 cr). Fundamentals of modern physical chemistry. Open only to chemistry M.S. and Ph.D. students. Cr is not allowed in both Chem 495 and 496. Prereq: Chem 306 and perm.

Chem **498 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

Chem **499** (s) **Directed Study** (cr arr). Prereq: perm.

Chem **500 Master's Research and Thesis** (cr arr).

Chem **501** (s) **Seminar** (cr arr). Prereq: perm.

Chem **502** (s) **Directed Study** (cr arr). Prereq: perm.

Chem **WS503 Advanced Topics in Inorganic Chemistry** (1-3 cr, max arr). WSU Chem 503.

Chem **504** (s) **Workshop** (cr arr). Prereq: perm.

Chem **507 Topics in Physical Chemistry** (1-9 cr, max 9). Selected topics in modern physical chemistry such as computational quantum mechanics, statistical mechanics, nonequilibrium thermodynamics, group theory, molecular dynamics, theory of condensed phases, or other topics not covered in regularly scheduled courses. Prereq: perm.

Chem **509-510 Advanced Physical Chemistry** (3 cr). Appl of quantum theory to chemical bonding, molecular spectroscopy, and molecular structure. Prereq: Chem 306 or perm.

Chem **513 Nuclear Chemistry** (3 cr). Intro to artificial and natural radioactivity, tracer methods, and atomic energy. Prereq: Chem 306 or Phys 360.

Chem **R516 Methods in Radiochemistry** (3 cr). Radiochemistry techniques and application of tracers to chemistry; fundamentals of radioactive decay; statistical relationships; interaction of radiation with matter; production of radioactive samples; chemistry of radioactive elements. Prereq: perm.

Chem **WS525 Selected Topics in Analytical Chemistry** (1-3 cr, max arr). WSU Chem 529.

Chem **535 Chemical Instrumentation** (4 cr). See Chem J435/J535.

Chem **WS537 Advanced Topics in Physical Chemistry** (1-3 cr, max arr). WSU Chem 537.

Chem **541-542 Biochemistry** (3 cr). See Chem J481-J482/J541-J542.

Chem **WS544 Advanced Topics in Organic Chemistry** (1-3 cr, max arr). WSU Chem 544.

Chem **553 Separation Theory and Gas Chromatography** (3 cr). Separation theory; modern gas chromatography, identification and quantification; analytical mass spectrometry. Prereq: Chem 306, 454 or perm.

Chem **554 Liquid Chromatography** (3 cr). Modern liquid chromatography; ion chromatography; supercritical-fluid chromatography. Prereq: Chem 553 or perm.

Chem **555 Advanced Analytical Chemistry** (3 cr). Fundamental principles of analysis; sampling; measurement validation; statistical evaluation; optimization techniques; pattern recognition; information theory. Prereq: Chem 306, 454, or perm.

Chem **556 Chemical Spectroscopy** (3 cr). Interpretation of spectra.

Chem **557** (s) **Topics in Analytical Chemistry** (1-9 cr, max 9). Atomic and molecular analytical spectroscopy; modern electrochemical methods; surface analysis tech.

Chem **561 Advanced Inorganic Chemistry** (3 cr). Theoretical approach to the underlying principles of inorganic chemistry; integration of theory and descriptive chemistry. Prereq: Chem 306, 463, or perm.

Chem **564 Inorganic Chemistry** (3 cr). See Chem 463-J464/J564.

Chem **565 Topics in Inorganic Chemistry** (1-9 cr, max 9). Coordination compounds; halogens; less familiar elements; clathrate, interstitial, nonstoichiometric compounds; chemical bonding; inorganic reaction mechanisms. Prereq: perm.

Chem **571 Topics in Organic Chemistry** (1-9 cr, max 9). Selected topics from the current literature. Prereq: perm.

Chem **573 Synthetic Organic Chemistry** (3 cr). Use of organic reactions in synthesis. Prereq: Chem 306, 473 or perm.

Chem **575 Mechanisms of Organic Reactions** (3 cr). Nucleophilic substitution; reactions of carboxylic acids and esters; carbanions; electrophilic and nucleophilic aromatic substitutions; elimination and addition reactors. Prereq: Chem 306, 473.

Chem **579 Physical Organic Chemistry** (3 cr). Physical chemistry methods applied to organic chemistry.

Chem **581 Carbohydrates** (3 cr). See Biochem 581.

Chem **582 Proteins and Enzymes** (4 cr). See Biochem 582.

Chem **583 Lipids and Membranes** (3 cr). See Biochem 583.

Chem **584 Nucleic Acids** (3 cr). See Biochem 584.

Chem **589 Advanced Topics in Biochemistry** (1-9 cr, max 9). See Biochem 589.

Chem **600 Doctoral Research and Dissertation** (cr arr).

Curricular Requirements

CHEMISTRY: GENERAL (B.S.)

Required course work includes the university requirements (see regulation J-3), the general requirements for the B.S. degree, and:

Course	Credits
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
Chem 253 Quantitative Analysis	5
Chem 277, 372 Organic Chemistry I, II	6
Chem 278, 376 Organic Chemistry Lab I, II	3
Chem 305-306 Physical Chemistry	6
Chem 307-308, Physical Chemistry Lab	2
Chem 409 Proseminar	1
CS 112 Introduction to Problem Solving & Programming	3
Math 180, 190, 200 Analytic Geometry & Calculus	11
Phys 210, 211, 222 Engineering Physics I, II, III	9
Phys 212, 213 Engineering Physics Lab	2
Phys 225 Introductory Physics Lab	1

This is a subminimal curriculum for students wishing to enter the profession of chemistry, but will provide a suitable foundation in chemistry for students who intend to enter secondary-school teaching or medicine.

CHEMISTRY: PROFESSIONAL (B.S.)

Note: Students who complete this curriculum will be certifiable to the American Chemical Society.

Required course work includes the university requirements (see regulation J-3), the general requirements for the B.S. degree, the courses listed in the "Chemistry General" curriculum (above), and:

Course	Credits
Chem 454 Instrumental Analysis	4
Chem 463-464, 465 Inorganic Chemistry & Lab	7
FL/GN 121-122 Elementary German	8

And two additional chemistry courses having Chem 306 as a prerequisite, or an alternate upper-division course in math or physics in combination with an approved chemistry course.

CHEMISTRY: TECHNICAL LITERATURE (B.S.)

Required course work includes the university requirements (see regulation J-3), general requirements for the B.S. degree, and:

Course	Credits
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
Chem 277, 372 Organic Chemistry I, II	6
Chem 278, 376 Organic Chemistry Lab	3
Chem 305-306 Physical Chemistry	6
Chem 307-308 Physical Chemistry Lab	2
Chem 409 Proseminar	1
Chem 441 Chemical Literature	1
Chem 463 Inorganic Chemistry	3
CS 112 Introduction to Problem Solving & Programming	3
Eng 317 Technical & Engineering Report Writing	3
FL/FR 101-102 Elementary French	8
FL/GN 121-122 Elementary German	8
FL/GN 221-222 Intermediate German	8

Math 180, 190, 200 Analytic Geometry & Calculus 11
Phys 210, 211, 222, 212, 213, 225 Engineering Physics & Lab
or 113-114-115-116 General Physics & Lab 8-12

CHEMISTRY: TECHNOLOGICAL (B.Tech.)

Note: Students who complete this curriculum will be certifiable to the American Chemical Society.

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
Chem 253 Quantitative Analysis	5
Chem 277, 278 Organic Chemistry I & Lab	4
Chem 305-306 Physical Chemistry	6
Chem 307-308 Physical Chemistry Lab	2
Chem 372, 376 Organic Chemistry II & Lab	5
Chem 409 Proseminar	1
Chem 454 Instrumental Analysis	4
Chem 463-464, 465 Inorganic Chemistry & Lab	7
Acctg 201 Principles of Accounting	3
BLaw 265 Legal Environment of Business	3
Bus 321 Marketing	3
CommG 131 Fundamentals of Public Speaking	2
CS 112 Introduction to Problem Solving & Programming	3
Econ 100 Contemporary Economics and 272 Foundations of Economic Analysis or 151, 152 Principles of Economics	6-7
Eng 317 Technical & Engineering Report Writing	3
Math 330 Linear Algebra	3
Phys 210, 211, 222 Engineering Physics I, II, III	9
Phys 212, 213 Engineering Physics Lab	2
Phys 225 Introductory Physics Lab	1
Stat 251 Principles of Statistics	3
Two courses in chem that require physical chem as prereq, or one chem course as above and one upper-div course in math or physics	6

It is strongly recommended that students take at least one year of German or Russian and ChE 223 (Material and Energy Balances).

Academic Minor Requirements

CHEMISTRY MINOR

This program is designed to give a nonscience major a sufficient background in general chemistry and laboratory techniques to improve his or her employment prospects as a laboratory technician and to improve the technical background of the student interested in science education or communication.

Course	Credits
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
Chem 253 Quantitative Analysis	5
Chem 277, 278 Organic Chemistry I & Lab	4
Chem 302, 303 Principles of Physical Chemistry & Lab	4
Chem 372 Organic Chemistry II	3

Department of Civil Engineering

Frederick J. Watts, Dept. Chair (104 Buchanan Engr. Lab.). Faculty: Charles E. Brockway, John I. Finnie, Verne A. Geidl, Donald F. Haber, James H. Hardcastle, Dennis R. Horn, Terry R. Howard, Michael D. Kyte, Robert D. Linderman, Chyr Pyng Liou, James H. Milligan, Richard J. Nielsen, Sunil Sharma, Alfred T. Wallace, Frederick J. Watts, Gerald A. Willett, Jr.

Students who enter civil engineering can anticipate a challenging and rewarding career—rewarding in personal fulfillment, in public service to humanity, and in financial opportunity.

In coming decades, the world will be faced with many problems, offering unprecedented demands for civil engineers to apply new and innovative solutions to satisfy society's needs. Environmental concerns will continue to mount throughout the globe, with the concept of environmentally sustainable development emerging as the tenet for future growth. Population expansion will stress available natural resources, requiring the applications of evolving technologies to the wise stewardship of these limited resources. Infrastracture—those facilities such as highways, bridges, airports, irrigation systems, water supply and distribution systems, and wastewater treatment systems—must be expanded and renewed if our economy is to flourish. This work will provide jobs for tomorrow's civil engineer.

The career dimensions in this profession are multifaceted and nearly unlimited in scope. Civil engineers may be involved in all aspects of engineering projects from planning and design to the construction and, in some cases, the operation of physical facilities. While the planning and design of most civil engineering projects takes place in engineering offices, civil engineers often go into the field to supervise the construction and operation of projects they have designed. Some of these field assignments, located in a variety of places throughout the world, may be particularly appealing and professionally rewarding.

Many civil engineers in practice specialize eventually in one area, such as structural engineering, sanitary and environmental engineering, soil mechanics and geotechnical engineering, highway and airport engineering, hydraulics and water resources engineering, hazardous waste management, and city and land-use planning. Many work in consulting firms, industrial companies, construction firms, or governmental agencies. With proper training, interest, and experience a civil engineer may move into management and executive positions, and many do.

At UI, the lower-division courses consist of a common core of basic courses in science, mathematics, and engineering required of most College of Engineering students. A required "core" of course work in the junior and senior years provides the student with a broad civil engineering education; some specialization is possible at the undergraduate level through selection of technical electives.

The Department of Civil Engineering occupies the first floor of the Buchanan Engineering Laboratory Building with some additional office and laboratory space in the basement and on the second floor of the building. Maintenance and replacement of existing equipment is provided by funds from research projects, from alumni donations, and from state educational funds. Instructional and research equipment include modern computing and data acquisition equipment.

The civil engineering faculty is a strong professional group with a wide variety of academic backgrounds and engineering practice experience. The faculty composition is such that a balance between the theoretical and practical aspects of civil engineering is preserved in the program.

Goals of the Department of Civil Engineering focus on maintaining a quality undergraduate program and a quality master's degree program in most specialty areas of civil engineering with associated research programs to support graduate education. Graduate programs at the Ph.D. level are limited to those areas of specialization where combined resources of this department and other departments at both UI and Washington State University provide a program of adequate depth. Research efforts of greatest interest are those that will provide financial support for the graduate students and that provide solutions to real problems of concern to the people of Idaho and the nation. Other departmental goals focus on providing professional service to state and local agencies and organizations and to individuals by providing continuing education opportunities and by assisting in very special engineering problems.

The department offers three graduate degree programs: (1) Master of Science (30 credits, with thesis), (2) Master of Engineering (33 credits, nonthesis), and (3) Doctor of Philosophy (in limited specialty areas). Course work requirements in each of the degree programs is relatively flexible depending on student interest and course availability. Financial assistance is available on a competitive basis in the form of instructional and graduate research assistantships. Students interested in graduate studies should specify the specialty area in which they wish to study.

Foreign students must have a TOEFL score of at least 550 for admission to any departmental degree programs.

Civil Engineering Courses

CE **200** (s) **Seminar** (cr arr). Prereq: perm.

CE **203** (s) **Workshop** (cr arr). Prereq: perm.

CE **204** (s) **Special Topics** (cr arr).

CE **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

CE **211 Engineering Measurements** (3-4 cr). For engineering and cartography students. Theory and practice; types and distribution of errors; manipulation of instruments; route and land surveying; construction survey; intro to photogrammetry. Two lec and one 3-hr lab a wk; additional 1-hr recitation a wk for 4 cr reqd unless waived by exam. Prereq: Math 140 and Engr 101 or equiv.

CE **215 Introduction to Civil Engineering** (2 cr). Application of modern basic science, mathematics, and fundamental engineering principles to solution of civil engineering problems by analytic and numeric methods; intro to computer methods and software for system and data analysis. Prereq: Math 180, CS 105, Phys 210, Engr 101.

CE **218 Elementary Surveying** (2 cr). Primarily for nonengineering students. Theory of measurements and manipulation of surveying instruments; application of surveying methods to construction; topographic and land surveys. One lec and one 3-hr lab a wk. Prereq: Math 140.

CE **299** (s) **Directed Study** (cr arr). Prereq: perm.

CE **316 Advanced and Route Surveys** (3 cr). Alt/yrs. Advanced survey methods including state plan coordinate systems, practical astronomy, and route surveys; field layout to include meridian determination, circular curves, spirals, setting slope and grade stakes, bridge and culvert surveys. Two lec and one 3-hr lab a wk. Prereq: CE 211.

CE **317 Land Surveying** (2 cr). Alt/yrs. History and development; related laws; preparation and filing of property descriptions and plats; subdivision planning; methods for property surveys. Prereq: CE 211.

CE **319 Photogrammetry and Photo-Interpretation** (3 cr). Geometry of single and stereoscopic pairs of aerial photographs; stereo-plotters; photo-interpretation applied to problems of engineering importance. Two lec and one 3-hr lab a wk. Prereq: CE 211.

CE **321 Hydrology** (3 cr). See AgE 351.

CE **322 Hydraulics** (3 cr). Applied principles of fluid mechanics; open channel flow, pressure conduit flow, intro to hydraulic machinery. Two 1-hr lec and one 1-hr supervised lab a wk; variable number of hrs of unsupervised lab. Prereq: ES 320.

CE **342 Theory of Structures** (4 cr). Stresses and strains in statically determinate and indeterminate beam, truss, and rigid frame structures; effects of moving loads; matrix displacement method. Three lec and one 3-hr lab a wk. Prereq: ES 340.

CE **357 Mechanical Properties of Construction Materials** (3 cr). Analysis of concrete mixtures; characteristics and measurements of stress-strain stiffness and strength properties of construction materials for improvement, selection, and design. Two lec, two hrs of lab, and 1 hr of recitation a wk. Prereq: Stat 301 and ES 340; coreq: Eng 317.

CE **372 Fundamentals of Transportation Engineering** (4 cr). Intro to planning, design, and operation of highway and traffic, public transportation, and airport systems. Three lec and one 3-hr lab a wk. Prereq: Stat 301; coreq: Eng 317.

CE **386 Engineering Economy** (3 cr) (CE 486). Economic analysis and comparison of engineering alternatives. Prereq: jr standing.

CE **400** (s) **Seminar** (cr arr). Prereq: perm.

CE **403** (s) **Workshop** (cr arr). Prereq: perm.

CE **404** (s) **Special Topics** (cr arr).

CE **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

CE **J420/J520 Fluid Dynamics** (3 cr). See ME J420/J520.

CE **421 Engineering Hydrology** (3 cr). See AgE 451.

CE **ID&WS422 Hydraulic Design** (3 cr). WSU C E 450. Hydraulic design of gravity and pressure systems; project oriented problems. One field trip. Prereq: CE 322 or equiv, CE 386, or perm.

CE **428 Open Channel Hydraulics** (3 cr). See AgE 458.

CE **431 Sanitary Engineering** (4 cr). Application of basic engineering science to treatment of domestic and industrial water supplies; treatment and disposal of domestic sewage and industrial wastes. Three lec and one 3-hr lab a wk. Prereq: CE 322 and ES 320 or perm.

CE **J432/J533 Water Quality Management Techniques** (3 cr). Physical, chemical, and biological techniques for analysis of water quality management problems; development of design criteria for corrective systems. Additional projects/assignments reqd for grad cr. Two lec and one 3-hr lab a wk. Prereq: perm.

CE **ID&WS-J436/ID&WS-J536 Wastewater Treatment System Design** (3 cr). WSU C E 544. Application of unit operations and processes to design of integrated wastewater treatment systems; critical analysis of existing designs. Additional projects/assignments reqd for grad cr. Prereq: perm.

CE **441 Reinforced Concrete Design** (3 cr). Ultimate strength method in accordance with latest building code. Two lec and one 3-hr lab a wk. Prereq: CE 342.

CE **WS442 Prestressed Concrete Design** (3 cr). WSU C E 434/534.

CE **WS443 Design of Timber Structures** (3 cr). WSU C E 436.

CE **444 Steel Design** (3 cr). Working stress design and plastic design of steel using latest AISC specifications. Two lec and one 3-hr lab a wk. Prereq: CE 342.

CE **ID&WS-J445/ID&WS-J545 Matrix Structural Analysis** (3 cr). WSU C E 530. Formulation of the analysis of trusses, beams, and frames using the stiffness method of matrix structural analysis; development of element properties, coordinate transformations, and global analysis theory; special topics such as initial loads, member and joint constraints, modification procedures. Special project demonstrating mature understanding of materials reqd for grad cr. Prereq: CE 342 or perm.

CE **460 Soil Mechanics** (3 cr). Physical and mech properties of soils; behavior of soil structures under load. Prereq: ES 320 and 340.

CE **WS461 Foundations** (3 cr). WSU C E 435.

CE **468 Engineering Properties of Soils** (3 cr). Lab measurements of physical and mechanical properties of soils; related applications, geotechnical reports. Two lec and one 3-hr lab a wk. Prereq: CE 460.

CE **ID474 Intermediate Transportation Engineering** (3 cr). WSU C E 474. Geometric design of urban and rural roadways, traffic operations analysis, traffic control systems, service and route planning for public transportation systems, transit operations analysis, and transportation network analysis. Prereq: CE 372 or perm.

CE **475 Pavement Evaluation and Design** (3 cr). Selection of conventional and new materials and applications; methods and comparative procedures of structural and other performance capabilities of asphalt and portland cement concrete pavements. Prereq: CE 357; Eng 317, or equiv; coreq: CE 372, 460, or equiv.

CE **482 Project Engineering** (1-4 cr, max 4). Four accelerated, 1 cr minicourses offered in one semester. Modern engineering management techniques for design, construction, and operation of typical engineering projects: (1) linear programming applied to project design and operation; (2) project economics and cost estimation; (3) reliability, risk, and decision analysis; (4) scheduling and bidding of projects (CPM, PERT). Four lec a wk for four wks for each minicourse. These minicourses may be taken separately. Prereq: univ sr standing and Stat 251 or 301.

CE **ID484 Engineering Law and Contracts** (2 cr). WSU C E 462. Development of law, courts, and ethics; laws of contracts, agency, sales, property, and patents; specifications, preparation of contract documents. Prereq: sr standing.

CE **491 Civil Engineering Professional Seminar** (1 cr). Employment and technical topics; preparation and presentation of professional paper. Course to be taken in last semester before graduation. Graded P/F.

CE **498 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

CE **499** (s) **Directed Study** (cr arr). Prereq: perm.

CE **500 Master's Research and Thesis** (cr arr).

CE **501** (s) **Seminar** (cr arr). Conferences and reports on current development.

CE **502** (s) **Directed Study** (cr arr). Prereq: perm.

CE **503** (s) **Workshop** (cr arr). Prereq: perm.

CE **504** (s) **Special Topics** (cr arr).

CE **506** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

CE **ID&WS510 Advanced Mechanics of Materials** (3 cr). See ME J439/J539.

CE **520 Fluid Dynamics** (3 cr). See ME J420/J520.

CE **ID521 Sedimentation Engineering** (3 cr). Intro to river morphology and channel responses; fluvial processes of erosion, entrainment, transportation, and deposition of sediment. Prereq: CE 428 or perm.

CE **522 Advanced Hydraulic Design** (3 cr). Applications of principles of fluid mechanics and hydraulics in design of hydraulic works, structures, and systems; design problems may include wells, pumps, pipelines and control valves; spillways, outlet works, and open channel control structures. Prereq: perm.

CE **ID523 Water Resources Systems** (3 cr). WSU C E 561. Concepts in water development; coordination of development of other natural resources; systems approach and optimization techniques. Prereq: perm.

CE **ID524 Water Resources Planning** (3 cr). WSU C E 562. Use of water resources; provision for domestic water supply, power, flood control, navigation, irrigation, and recreation; design and feasibility problems; guest lecturers. Prereq: perm.

CE **WS525 Intermediate Fluid Mechanics** (3 cr). WSU C E 550.

CE **WS526 Topics in Fisheries Engineering** (1-3 cr, max 6). WSU C E 557.

CE **WS527 Advanced Topics in Hydraulic Engineering** (1-3 cr, max 6). WSU C E 552.

CE **ID&WS528 Stochastic Hydrology** (3 cr). WSU C E 559. Analyses and evaluation of hydrologic data and time series; application of stochastic models to data generation and record extension (daily and storm precipitation, monthly and annual streamflows); regression and autoregression analyses; extensive computer applications for data analysis and synthesis. Prereq: CE 321, intro stat course.

CE **529 Natural Channel Flow** (3 cr). See AgE 555.

CE **WS530 Instrumental Analysis of Environmental Contaminants** (3 cr). WSU C E 540.

CE **ID&WS531 Environmental Engineering Unit Operations** (3 cr). WSU C E 541. Analysis and design of physical and chem operations of water and waste treatment; flow models, sedimentation, flocculation, filtration, and water conditioning. Prereq: perm.

CE **ID&WS532 Environmental Engineering Unit Processes** (3 cr). WSU C E 542. Analysis and design of chemical and biological processes of water and waste treatment, stream pollution analysis, gas transfer, biological oxidations, aerobic and anaerobic processes, and combustion processes. Prereq: perm.

CE **533 Water Quality Management Techniques** (3 cr). See CE J432/J533.

CE **WS534 Sanitary Engineering Analysis** (2 cr). WSU C E 581.

CE **ID&WS536 Wastewater Treatment System Design** (3 cr). See CE ID&WS-J436/ID&WS-J536.

CE **WS538 Engineering Aspects of Aquatic Biology** (4 cr). WSU C E 584.

CE **WS539A Industrial Waste Problems** (3 cr). WSU C E 545.

CE **WS539E Air Pollution Measurement Techniques** (3 cr). WSU C E 572.

CE **WS539F Air Pollution Abatement and Administration** (2 cr). WSU C E 573.

CE **WS539G Engineering Aspects of Environmental Chemistry** (2-4 cr). WSU C E 583.

CE **540 Continuum Mechanics** (3 cr). See ES 540.

CE **ID&WS541 Structural Reliability and Probablistic Design** (3 cr). WSU C E 531. Fundamentals of structural reliability theory, treatment of uncertainties in structures, Level II and III reliability methods, code calibration, code safety formats, with applications to specific structural members. Prereq: perm.

CE **ID542 Advanced Design of Structures** (3 cr). WSU C E 537. Composite action, hybrid sections, plate girders, curved girders, fatigue design, splices and connections, loads, load combinations, load distribution, computer modeling and analysis. One 1-day field trip. Prereq: CE 444 or perm.

CE **ID&WS543 Dynamics of Structures** (3 cr). WSU C E 512. Alt/yrs. Behavior of structures under impact, impulse, and seismic loads. Prereq: CE 441, 444, Math 310.

CE **ID&WS544 Buckling in Structures** (3 cr). WSU C E 513. Analysis of elastic and inelastic stability of columns, trusses, rigid frames, plates, and shells; lateral stability of beams. Prereq: CE 444, Math 310.

CE **ID&WS545 Matrix Structural Analysis** (3 cr). See CE J445/J545.

CE **ID&WS546 Finite Element Analysis** (3 cr). Same as ME 549. WSU C E 532. Formulation of theory from basic consideration of mechanics; applications to structural engineering, solid mechanics, soil and rock mechanics; fluid flow. Prereq: perm.

CE **WS547 Advanced Reinforced Concrete Design** (3 cr). WSU C E 533.

CE **548 Elasticity** (3 cr). Same as ME 548. Mathematical analysis of strain and stress, including vectors, tensors, and coordinate transformations; equations of elasticity; stress problems involving extension, torsion, and flexure; theories of failure. Prereq: perm.

CE **WS549 Advanced Topics in Structural Engineering** (3 cr). WSU C E 537.

CE **556 Physical Properties of Concrete** (3 cr). Design aspects of portland cement and asphalt concrete mixtures; physical and mechanical properties; effects of aggregate and binder constituents. Two lec and one 3-hr lab a wk. Prereq: CE 357 or perm.

CE **557 Mechanical Properties of Elastic and Nonelastic Materials** (3 cr). Procedures for determining stress, strain, and modulus of materials used in construction, and for evaluating their performance with changes of time and frequency, temperature, and moisture under various modes of loading.

CE **ID561 Advanced Soil Mechanics** (3 cr). WSU C E 527. Effective and total strength and deformation parameters for soils, lab and field methods of determination, applications in stability analysis and deformation predictions for rigid and flexible walls, anchors, buried structures, excavations, and slopes. Prereq: CE 460 or perm.

CE **ID562 Advanced Foundation Engineering** (3 cr). WSU C E 528. Consolidation theories, stress and strain distribution, bearing capacity and settlements of shallow and deep foundations, pile group behavior, theory of subgrade reaction, mat foundations, laterally loaded piles. Prereq: CE 460 or perm.

CE **563 Seepage and Earth Dams** (3 cr). See GeolE 535.

CE **ID565 Soil Dynamics** (3 cr). WSU C E 529. Theory of foundation response to dynamic loads, design and analysis of machine foundations, foundation isolation, behavior of soils subjected to dynamic loads, field and laboratory methods for evaluation of dynamic properties, liquefaction, wave equation, analysis of piles.

CE **ID566 Earthquake Engineering** (3 cr). Review of geological and seismological factors that influence design; seismic wave propagation; earthquake parameters; probabilistic hazard assessment; dynamic soil properties; response spectra; computer applications; earthquake resistant designs. Prereq: CE 460 or equiv, or perm.

CE **WS567 Soil and Site Improvement** (3 cr). WSU C E 425/525.

CE **WS569 Advanced Topics in Geotechnical Engineering** (3 cr). WSU C E 510.

CE **ID&WS571** (s) **Advanced Topics in Transportation Engineering** (3 cr, max 12). WSU C E 501. Series of advanced courses in transportation engineering focusing on traffic and highway engineering, public transportation engineering, airport planning and engineering, and transportation planning. Prereq: CE 474 or perm.

CE **589 Water Resources Seminar** (1 cr). See Inter 589.

CE **597** (s) **Practicum** (cr arr). Prereq: perm.

CE **598** (s) **Internship** (cr arr). Prereq: perm.

CE **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

CE **600 Doctoral Research and Dissertation** (cr arr).

Curricular Requirements

CIVIL ENGINEERING (B.S.C.E.)

Note: A minimum GPA of 2.00 in UI College of Engineering upper-division courses is required for graduation in this program.

Required course work includes the university requirements (see regulation J-3) and:

First and Second Years	Credits
Courses common to engineering curricula (see part 4)	39
CE 211 Engineering Measurements	3
CE 215 Introduction to Civil Engineering	2
EE 207 Introduction to Electrical Engineering	3
ES 220 Engineering Dynamics	3
ES 340 Mechanics of Materials	3
Third and Fourth Years	
CE 321 Hydrology	3
CE 322 Hydraulics	3
CE 342 Theory of Structures	4
CE 357 Mechanical Properties of Construction Materials	3
CE 372 Fundamentals of Transportation Engineering	4
CE 386 Engineering Economy	3
CE 431 Sanitary Engineering	4
CE 441 Reinforced Concrete Design or 444 Steel Design	3
CE 460 Soil Mechanics	3
CE 491 Civil Engineering Professional Seminar	1
ES 320 Fluid Mechanics	3
ES 321 Thermodynamics & Heat Transfer	3
Eng 317 Technical & Engineering Report Writing	3
Geol 101, 102 Physical Geology & Lab	4
Stat 301 Probability & Statistics	3
Humanities and social sciences electives (in addition to satisfying regulation J-3-d, one urban studies course must be selected from an approved list specified by dept)	16
Technical electives (incl at least 9 cr from CE 421, 422, 436, 441, 444, 468, 474, 475)	14

The minimum number of credits for the degree is 129.

School of Communication

Peter A. Haggart, Director, School of Communication (Communication Bldg.). Faculty: Roy Alden Atwood, Anna Banks, Stephen P. Banks, Don H. Coombs, Sandra Haarsager, Peter A. Haggart, Tom E. Jenness, Alan Lifton, Paul L. Miles, Mark Secrist, William P. Woolston. Affiliate Faculty: Edmund K. Joyce.

Communication is more and more being seen as the discipline that links other disciplines, a discipline that will be vital if people, organizations, and governments are to cope with today's complex world. Students with degrees from the School of Communication find jobs with newspapers, broadcasting stations, public relations firms, advertising agencies, industry, and government.

The School of Communication provides professional preparation in communication fields and also functions as an academic unit of the College of Letters and Science for the purpose of offering courses to students in other fields.

The degree programs in the school are designed to combine theory and practical experience. Students get hands-on experience with equipment in their areas of specialization. There are degree programs or options in advertising, general communication, journalism, organizational communication, public relations, and visual communication. Students in those programs either take a foreign language and obtain a B.A. degree or take 18 credits in a specialized subject matter area outside the school and obtain a B.S. degree.

Courses

GENERAL COMMUNICATION

Note: See School of Communication requirements below for eligibility requirements for registration in upper-division courses.

CommG **131 Fundamentals of Public Speaking** (2 cr). Satisfies core requirement J-3-a. Skills and techniques of effective speaking.

CommG **132 Oral Interpretation** (2 cr). Use of voice and body to communicate the intellectual and emotional meaning of literature.

CommG **134 Nonverbal Communication** (2 cr). Study of body language; proxemics, kinesics, and other nonverbal codes.

CommG **188 Experiences in Visual Thinking** (3 cr). Expansion and strengthening of creative potential through right brain thinking experiences: seeing, drawing, and imagining; solution of creative problems by applying learned principles and visual thinking strategies.

CommG **200** (s) **Seminar** (cr arr). Prereq: perm.

CommG **203** (s) **Workshop** (cr arr). Prereq: perm.

CommG **204** (s) **Special Topics** (cr arr).

CommG **232 Parliamentary Law and Procedure** (1 cr). Practice of speech under parliamentary conditions.

CommG **233 Interpersonal Communication** (3 cr). Communication concepts and skills applied to relationship management; communication process, listening, self-disclosure, perception, conflict.

CommG **288 Introduction to Film Art** (3 cr). Intro to aesthetics of film; considers film as a cultural artifact by surveying fundamental aspects of film form, systems, style, and analysis; no previous knowledge of film or photography reqd. Two lec, one discussion period, and one film showing period a wk.

CommG **331 Conflict Management** (3 cr). Principles of effective conflict management in various settings; emphasis on styles of conflict, power, goals, strategies, and intervention techniques.

CommG **332 Communication and the Small Group** (3 cr). Problem-solving methods; performing as a group leader or as a group member; small group behavior.

CommG **333 Interviewing** (3 cr). Prin of information gathering and problem solving in interviews.

CommG **335 Organizational Communication** (3 cr). Philosophy, methods, and designs for studying communication system of a complex organization.

CommG **347 Persuasion** (3 cr). Theory and practice of effective persuasive techniques. Prereq: CommG 131.

CommG **382 History of Photography** (3 cr). History and development of photography in its various forms; photography as a creative art form and a reflection of society; selected slide lecs. Prereq: Comm 281 or perm.

CommG **384 History of American Film** (3 cr). Hist and dev of U.S. film industry; film as an art form; film as a reflection of society; selected genres and directors.

CommG **386 American Documentary Film/Television** (3 cr). Open to all students. Development of nonfiction film, TV, photography; documentary style and form; documentary's power to communicate; noted practitioners; issues raised by documentary. Three lec and one lab a wk.

CommG **400** (s) **Seminar** (cr arr). Prereq: perm.

CommG **403** (s) **Workshop** (cr arr). Prereq: perm.

CommG **404** (s) **Special Topics** (cr arr).

CommG **430 Perspectives in Film** (3 cr). See Eng 430.

CommG **433 Organizational Communication Theory and Research** (3 cr). Overview of current theory and research in organizational communication; interpretive and critical perspectives on organizational culture, organizational change, organization and environment relationships, management systems, and power relationships.

CommG **435 Strategies of Organizational Communication** (3 cr). Theory and methods of improving communication in organizations, consulting, training, organizational change. Prereq: CommG 335.

CommG **ID440 Media and the Canadian Experience** (3 cr). WSU Com 403. History, structure, and function of Canada's mass media and cultural industries; comparison of Canadian and American media policies and practices. Two lec and one lab a wk; some films, videos, and slides in evening.

CommG **499** (s) **Directed Study** (cr arr). Prereq: perm.

COMMUNICATION

Note: See School of Communication requirements below for eligibility requirements for registration in upper-division courses.

Comm **121 News Writing** (3 cr). Basic principles of writing news. Two 2-hr lec-labs a wk. Prereq: Eng 104 and ability to type.

Comm **140 Mass Media and Society** (3 cr). Role of the media; their performance and significance.

Comm **200** (s) **Seminar** (cr arr). Prereq: perm.

Comm **203** (s) **Workshop** (cr arr). May be graded P/F. Prereq: perm.

Comm **204** (s) **Special Topics** (cr arr).

Comm **222 Reporting** (3 cr). Types and sources of news; gathering and writing news. Two lec and one lab a wk. Prereq: Comm 121.

Comm **265 Advertising and Society** (3 cr). Survey of role of advertising in American society including effects on consumers; regulation, media, and advertising as a creative process.

Comm **270 Broadcast Commercial Writing/Production** (3 cr). Basic principles of writing and production of commercials in broadcast, with emphasis on radio production/announcing and writing techniques for all electronic media. Prereq: Comm 121.

Comm **271 Basics of Television Production** (2 cr). For non-telecommunication majors. Basic camera operation, VCR operation, lighting, editing.

Comm **278 Introduction to Radio/TV Production** (3 cr). Audio and video equipment and recording procedures. One 1-day field trip.

Comm **281 Understanding Photography** (3 cr). Basic skills of camera operation; emphasis on image design and creative techniques; lec topics include exposure, lenses, composition, filters, and films. Two lec and one 3-hr recitation a wk.

Comm **299** (s) **Directed Study** (cr arr). Prereq: perm.

Comm **323 Public Affairs Reporting** (3 cr). Problems and practice in reporting the courts, government, politics, other public issues. Prereq: Comm 121, 222, or perm.

Comm **325 News Editing** (3 cr). News selection, evaluation, editing, and display. Two lec and one lab a wk. Prereq: Comm 121, 222, or perm.

Comm **352 Principles of Public Relations** (3 cr). Understanding public relations programs, functions and techniques; projects related to student's interest. Prereq: Comm 121.

Comm **354 Publications Editing** (3 cr). Design and production of magazines, periodicals, brochures.

Comm **356 Organizational Media** (3 cr). Exam of various types of media used by organizations to communicate with internal and external audiences; focus on problem identification, problem solving, and critical thinking skills related to use of media in context of organizational issues and problems. Prereq: Comm 352.

Comm **360 Broadcast Media Advertising** (3 cr). Advertising creative process in radio and television, including copywriting, and production processes and techniques. Prereq: Comm 265.

Comm **362 Print Media Advertising** (3 cr). Advertising creative process in print media (newspapers, magazines, direct mail, outdoor, etc.), including copywriting, typesetting, layout, design, and production processes and techniques. Prereq: Comm 265.

Comm **364 Advertising Media Planning** (3 cr). Advertising media planning for all media, both broadcast and print; includes interpretation of ratings and market data, media strategies and concepts, and specific buying process in each advertising medium. Prereq: Comm 265.

Comm **374 Broadcast News Writing/Production** (3 cr). Techniques of gathering, writing, and producing news for radio and television. One lec and one lab a wk. Prereq: Comm 270, 278.

Comm **378 Television Production** (3 cr). Basic production theory, lighting, composition, sound; producing and directing; practice in a variety of television production forms. Field trips. Prereq: Comm 265, 278, 374.

Comm **381 Photographic Materials and Techniques** (3 cr). Basic to intermediate level black and white lab course; film developing, printing; exploration of various films, developers, toners, and photo techniques; group critiques. Two lec and two 3-hr labs a wk. Prereq: Comm 281 or perm.

Comm **385 Color Photography** (3 cr). Entry-level color lab course; discussion and practice in color theory; exploration of all conventional color processes, slides, negatives, and prints. Two lec and two 3-hr labs a wk. Prereq: Comm 281 or perm.

Comm **400** (s) **Seminar** (cr arr). Prereq: perm.

Comm **403** (s) **Workshop** (cr arr). May be graded P/F. Prereq: perm.

Comm **404** (s) **Special Topics** (cr arr).

Comm **425 Feature Article Writing** (3 cr). Writing human interest stories, editorials, reviews, and columns. Prereq: Comm 121 or perm.

Comm **431 Professional Presentation Techniques** (3 cr). Multimedia presentation of proposals, management plans, feasibility reports, instructions, and scientific papers; designed to assist students in professional fields in making presentations to professional and lay audiences.

Comm **441 Ethics in Mass Communication** (3 cr). Examination of ethical responsibilities and obligations of people working in the mass media.

Comm **443 Media Management** (3 cr) (Comm 473). Management principles as they apply to electronic and print media; emphasis on personnel management, budgeting, programming, sales, marketing and promotion, legal constraints, new technologies, and strategic planning.

Comm **444 Communication and Public Opinion** (3 cr). Role of communication in the formation of public opinion with special emphasis on mass media.

Comm **445 History of Mass Communication** (3 cr). Growth and development of mass media in the U.S.

Comm **448 Law of Mass Communication** (3 cr). Freedom of the press, libel, right to know, privacy, contempt in print and broadcast media.

Comm **449 Theory in Communication** (3 cr). Interdisciplinary approach to understanding the process of communication.

Comm **450 Quantitative Research Methods** (3 cr). Design of experiments and field studies and planning of polls relevant to communication, with special attention to causality, reliability, and validity, and emphasis on interpretation of results.

Comm **451 Qualitative Research Methods** (3 cr). Aims and methods of qualitative research; emphasis on philosophical assumptions, research design, data collection, reliability/validity issues, and data analysis within the context of interpretive, critical and naturalistic approaches to communication research and practice.

Comm **452 Public Relations Management** (3 cr). Management case studies of public relations and advertising programs; practice in developing and executing campaigns with emphasis on presentation skills and equipment. Prereq: Comm 352.

Comm **458 Public Relations Case Studies** (3 cr). Examination of actual and created public relations case studies; reasons for their success or failure examined and evaluated. Prereq: Comm 452.

Comm **459 Issues Management** (3 cr). Strategies for managing public sector issues as they relate to communication; emphasis on crisis communication, corporate public affairs, and fact finding.

Comm **466 Advertising Campaign Strategy** (3 cr). Advanced advertising strategies in creative approaches and media usage; current ad campaigns and development of a com-

plete advertising campaign for a client. Prereq: Comm 360, 362, 364, 431, and Art 121 or 225.

Comm **468 The Advertising Agency** (3 cr). Functioning of an advertising agency, including management, accounting, creative and media buying systems, government regulation, account management, and creative strategies in the marketplace. Field trips. Prereq: Comm 466 or perm.

Comm **476 Advanced Broadcast News Writing/Production** (3 cr). Advanced techniques in writing and production of news for radio and television. One lec and one lab a wk. Prereq: Comm 374.

Comm **478 Advanced Television Production** (4 cr). Development, planning, budgeting, and execution of television productions; development of professional techniques. Field trips. Prereq: Comm 374, 378.

Comm **481 Advanced Black and White Photography** (3 cr). Advanced-level black and white lab course; covers basic lighting, portraits, studio, photojournalism, business; group critiques. Two lec and two 3-hr labs a wk. Prereq: Comm 381 or perm.

Comm **485 Advanced Color Photography** (3 cr). Advanced-level lab course; covers process monitoring, masking, posterization, special effects, and conceptual development; group critiques. Two lec and two 3-hr labs a wk. Prereq: Comm 385 or perm.

Comm **489 Critical Issues in Visual Communication** (3 cr). Examination of major theoretical approaches to visual media (photography, film, and television); impact of visual images on society; communicative and aesthetic functions of visual images; ethical concerns and visual media.

Comm **490 International Communication** (3 cr). Analysis of channels and media for international communication; interpersonal interaction and cross-cultural mass media.

Comm **498 Internship** (0-3 cr, max 3). Supervised experience in professional communication. Graded P/F. Prereq: perm of director, School of Communication.

Comm **499** (s) **Directed Study** (cr arr). Prereq: perm.

Curricular Requirements

Note: Required courses in a student's major cannot be used to satisfy the distributional requirements for the College of Letters and Science.

School of Communication Requirements

All majors in the School of Communication are required to take Comm 121, News Writing (freshman or sophomore year), CommG 131, Fundamentals of Public Speaking, Comm 140, Mass Media and Society, one 3-credit course in computer science, either Stat 150 or Stat 251, and at least one course in the "visual" basic skill area as approved by the School of Communication. Candidates for the B.S. degree are required to complete an academic minor or area of emphasis of at least 18 credits outside the School of Communication. Students must obtain approval from the School of Communication to apply internship credit toward a degree from the school.

Comm 121, CommG 131, and Comm 140 must be completed with a grade of C or better before a communication major may enroll in any upper-division communication courses.

A minimum cumulative university grade-point average of 2.50 is required of students seeking upper-class standing in the school or graduating with any of the majors offered by the school. All students must meet the minimum grade-point average and have completed a minimum of 58 credits to preregister, register, or add any upper-division course (numbered 300 or above) offered by the school. Registration preference in all courses is given to School of Communication majors. In order to remain in good standing in the school, the 2.50 grade-point average must be maintained.

Note: Students using a catalog issued before 1991 must meet a minimum cumulative grade-point average of 2.25 as applied above.

A student who graduates with a major in the School of Communication must complete a minimum of 128 credits of which (1) a maximum of 38 credits may be taken in communication courses having the prefix of Comm (CommG courses are not included), (2) a minimum of 65 credits must be taken in courses offered by the College of Letters and Science and the Departments of Art and Economics, (3) a maximum of 25 credits may be taken in courses offered outside the College of Letters and Science or the Departments of Art and Economics, and (4) a maximum of 6 internship credits may be applied toward a degree, including no more than 3 credits from other academic fields.

COMMUNICATION (B.A. or B.S.)

Required course work includes the university requirements (see regulation J-3), the general L & S and School of Communication requirements for either the B.A. or B.S. degree, and:

A. ADVERTISING OPTION

Course	Credits
CommG 233 Interpersonal Communication	3
Comm 265 Advertising & Society	3
Comm 360 Broadcast Media Advertising	3
Comm 362 Print Media Advertising	3
Comm 364 Advertising Media Planning	3
Comm 431 Professional Presentation Techniques	3
Comm 441 Ethics in Mass Communication	3
Comm 445 History of Mass Comm or 448 Law of Mass Comm	3
Comm 466 Advertising Campaign Strategy	3
Art 121 Visual Communication & the Design Process or 225 Communication Graphics	2-3
Bus 321 Marketing	3
Business elective course	3
Courses selected from the following	6
Comm 271 Basics of TV Production	
Comm 281 Understanding Photography	
Comm 352 Principles of Public Relations	
Comm 354 Publications Editing	
Comm 444 Communication & Public Opinion	
Comm 445 History of Mass Communication	
Comm 448 Law of Mass Communication	
Comm 449 Theory in Communication	
Comm 451 Qualitative Research Methods	
Comm 468 The Advertising Agency	

B. PUBLIC RELATIONS OPTION

Course	Credits
CommG 233 Interpersonal Communication	3
CommG 335 Organizational Communication	3
Comm 352 Principles of Public Relations	3
Comm 356 Organizational Media	3
Comm 431 Professional Presentation Techniques	3
Comm 451 Qualitative Research Methods	3
Comm 452 Public Relations Management	3
Comm 458 Public Relations Case Studies	3
Two of the following courses	6
CommG 332 Communication & the Small Group	
CommG 347 Persuasion	
CommG 433 Organizational Comm Theory & Research	
Comm 222 Reporting	
Comm 354 Publications Editing	
Comm 425 Feature Article Writing	
Comm 444 Communication & Public Opinion	
Comm 449 Theory in Communication	
One of the following courses	3
Bus 421 Marketing Research & Analysis	
PolSc 435 Political Research Methods & Approaches	
Soc 410 Introduction to Social Research	

C. GENERAL OPTION

Course	Credits
CommG 233 Interpersonal Communication	3
CommG 332 Communication & the Small Group	3
CommG 335 Organizational Communication	3
Comm 449 Theory in Communication	3
Additional upper-division CommG courses	9
Additional upper-division Comm courses	9

JOURNALISM (B.A. or B.S.)

Required course work includes the university requirements (see regulation J-3), the general L & S and School of Communication requirements for either the B.A. or B.S. degree, and:

Course	Credits
Comm 222 Reporting	3
Comm 281 Understanding Photography	3
Comm 323 Public Affairs Reporting	3
Comm 325 News Editing	3
Comm 441 Ethics in Mass Communication	3
Comm 445 History of Mass Communication	3
Comm 448 Law of Mass Communication	3
Three of the following	9
Comm 354 Publications Editing	
Comm 425 Feature Article Writing	
Comm 444 Communication & Public Opinion	
Comm 449 Theory in Communication	
Comm 451 Qualitative Research Methods	
Comm 498 Internship	
Cognate fields (at least 12 cr in upper-division courses; if the student's minor is one of these fields, no more than 6 cr of the minor may be counted toward this requirement)	
Economics	6
Political science	6
Additional cr from anthro, econ, geog, hist, pol sc, soc, phil, and psych	18

ORGANIZATIONAL COMMUNICATION (B.A. or B.S.)

Required course work includes the university requirements (see regulation J-3), the general L & S and School of Communication requirements for either the B.A. or B.S. degree, and:

Course	Credits
CommG 233 Interpersonal Communication	3
CommG 331 Conflict Management	3
CommG 332 Communication & the Small Group	3
CommG 333 Interviewing	3
CommG 335 Organizational Communication	3
Comm 431 Professional Presentation Techniques	3
Comm 450 Quantitative Research Methods or 451 Qualitative Research Methods	3
Communication electives selected from the following	11-12
CommG 134 Nonverbal Communication	
CommG 433 Organization Communication Theory & Research	
Comm 265 Advertising & Society	
Comm 271 Basics of TV Production	

Comm 352 Principles of Public Relations
Comm 354 Publications Editing
Comm 356 Organizational Media
Comm 441 Ethics in Mass Communication

and one of the following emphasis areas (constitutes minor) (Stat 251 is recommended for the math core requirement):

HUMAN RESOURCES DEVELOPMENT EMPHASIS

CommG 435 Strategies of Organizational Communication 3
Ed 314 Strategies for Teaching 3
Psych 316 Industrial Psychology 3
Psych 325 Cognitive Psychology 3
Electives selected from general emphasis list 12

GENERAL EMPHASIS

Electives selected from the following 20
Acctg 201 Principles of Accounting
Bus 311 Introduction to Management
Bus 321 Marketing
Bus 412 Human Resource Management
Bus 416 Staffing & Compensation
Bus 441 Labor Relations
Eng 313 Business Writing
PolSc 451 Public Administration
PolSc 454 Public Organization Theory
Psych 320 Introduction to Social Psychology
Psych 446 Engineering Psychology
Rec 260 Leisure & Society
Soc 312 Sociology of Organizations

VISUAL COMMUNICATION (B.A., B.S.)

Required course work includes the university requirements (see regulation J-3), the general L & S and School of Communication requirements for either the B.A. or B.S. degree, and:

Course	Credits
CommG 188 Experiences in Visual Thinking	3
CommG 288 Introduction to Film Art	3
Comm 281 Understanding Photography	3
Comm 441 Ethics in Mass Comm or Comm 448 Law of Mass Comm	3
Comm 489 Critical Issues in Visual Communication	3
Two of the following	6
CommG 382 History of Photography	
CommG 384 History of American Film	
CommG 386 American Documentary Film/Television	
Comm 445 History of Mass Communication	
Art graphics/design course	2-3
Six additional courses from the fields of photography, film, radio, television, or other visual arts (three courses must be numbered 300 or above)	17-18

Students seeking careers in broadcasting, photography, film, or other visual arts should select their courses carefully when meeting the "additional courses" required listed above. Advisers have lists of suggested courses.

Academic Minor Requirements

ADVERTISING MINOR

Course	Credits
Comm 140 Mass Media & Society	3
Comm 265 Advertising & Society	3
Comm 360 Broadcast Media Advertising	3
Comm 362 Print Media Advertising	3
Comm 431 Professional Presentation Techniques	3
At least two of the following	6
Comm 352 Principles of Public Relations	
Comm 364 Advertising Media Planning	
Comm 444 Communication & Public Opinion	
Comm 448 Law of Mass Communication	
Comm 468 The Advertising Agency	

INTERPERSONAL COMMUNICATION MINOR

Course	Credits
CommG 131 Fundamentals of Public Speaking	2
CommG 233 Interpersonal Communication	3
CommG 332 Communication & the Small Group	3
Comm 140 Mass Media & Society	3
Electives from the following (minimum credit)	10
CommG 132 Oral Interpretation	
CommG 134 Nonverbal Communication	
CommG 232 Parliamentary Law & Procedure	
CommG 331 Conflict Management	
CommG 333 Interviewing	
CommG 335 Organizational Communication	
CommG 347 Persuasion	
Comm 431 Professional Presentation Techniques	

JOURNALISM MINOR

Course	Credits
Comm 121 News Writing	3
Comm 140 Mass Media & Society	3
Comm 222 Reporting	3
At least four of the following	12
Comm 323 Public Affairs Reporting	
Comm 425 Feature Article Writing	
Comm 441 Ethics in Mass Communication	
Comm 444 Communication & Public Opinion	
Comm 445 History of Mass Communication	
Comm 448 Law of Mass Communication	

PUBLIC RELATIONS MINOR

Course	Credits
CommG 433 Organization Communication Theory & Research	3
Comm 121 News Writing	3
Comm 140 Mass Media & Society	3
Comm 352 Principles of Public Relations	3
Comm 356 Organizational Media	3
Comm 452 Public Relations Management	3
One of the following	3
CommG 335 Organizational Communication	
Comm 354 Publications Editing	
Comm 431 Professional Presentation Techniques	

VISUAL COMMUNICATION MINOR

Course	Credits
CommG 188 Experiences in Visual Thinking	3
CommG 288 Introduction to Film Art	3
Comm 121 News Writing	3
Comm 140 Mass Media & Society	3
Comm 271 Basics of TV Production	2
Comm 441 Ethics in Mass Comm or Comm 448 Law of Mass Comm	3
Comm 445 History of Mass Communication	3

COMPUTER ENGINEERING—see Department of Electrical Engineering

Department of Computer Science

John W. Dickinson, Dept. Chair (B40 Janssen Engr. Bldg.). Faculty: John W. Dickinson, A. Kent Dunnam, James A. Foster, William S. Junk, Jack Kulas, Thomas H. Miller, Charles K. Nelson, Paul W. Oman, Robert C. Probasco, Molly W. Stock, Karen H. Van Houten, Ya-Yen Wang, Phillip Windley.

Computer science is the systematic study of algorithmic processes that describe and transform information: their theory, analysis, design, efficiency, implementation, and application. It is a broad discipline with an ever growing array of opportunities. Graduates in this field can find employment in a wide spectrum of public and private enterprises.

The field of computer science encompasses many areas of specialization. One may find a personal niche in software development, systems development and hardware selection, studies of compatibility between hardware and software, language development and modification, or perhaps a combination of these and any number of other diverse computer-oriented applications and concepts. Because of this diversity in potential application areas, the computer scientist must be familiar with the language of the physical sciences, mathematics, and English. If the computer is to extend its role as a benefit to mankind, the computer scientist must be broadly educated and conversant with the many implications of the powerful tool that he or she is controlling and developing.

The Department of Computer Science was formed in 1981 and is in the College of Engineering. The Bachelor of Science in Computer Science has been offered at UI since 1977. This program consists of a carefully designed technical core, surrounded by an extensive array of challenging technical elective courses. The technical core consists of courses in algorithms and data structures, programming languages, computer architecture, numerical and symbolic computation, operating systems, software engineering, database, and a senior capstone design sequence. All of these courses have important components of theory, abstraction, and design.

Students in computer science have the unique opportunity to draw from the expertise of an outstanding faculty with extensive experience in industry, teaching, and research. Computers currently available to students include an extensive department network of

workstations from Apollo and Hewlett-Packard, several campus personal computer laboratories, and the university's two IBM 4381 computers. All major campus and department computer systems are networked together, providing a state-of-the-art computing environment.

The purpose of the graduate program in computer science is to develop the student's critical professional thinking and intuition. The curriculum involves a balanced mixture of learning experiences to make the graduate capable of sound professional decisions. The study of computer science at the graduate level requires mathematical maturity, skill in the use of high-level and machine-level programming languages, and basic knowledge of computer hardware organization and technology. Students wishing to enter the master's program must demonstrate competence in specific areas equivalent to the material covered in several of the undergraduate courses. The following list of courses is considered to be the minimum set necessary to satisfy prerequisite requirements for advanced undergraduate and graduate level courses in computer science: CS 213; CS 241; Math 176; Math 190 or 376; Math 330; Stat 301. A student who does not have an adequate background in these subject areas will be required to satisfactorily complete those courses in which he or she is deficient. The Graduate Record Examination general test is also required for admission. For a complete description of the master's program in computer science, consult the Graduate Bulletin.

Computer Science Courses

CS **100 Introduction to Computers and Programming** (3 cr). Satisfies core requirement J-3-c. Intended for non-computer science majors. Survey of computer systems and applications including overview of hardware, software, industry trends, and societal implications; intro to personal computer application software and programming concepts. Three lec a wk and periodic labs.

CS **102 Programming and Problem Solving for Scientists** (3 cr). Not intended for CS majors. Only 2 cr allowed after CS 100; no cr after CS 112. Intro to fundamental problem solving techniques using the computer; intro to personal computer application software and to Pascal programming on a personal computer and mainframe. Prereq: Math 140 or equiv.

CS **103 Introduction to COBOL Programming** (3 cr). Intro to COBOL programming, including coverage of files, sorts, and tables. Prereq: CS 100, 105, or 112.

CS **105 FORTRAN Programming for Engineers** (2 cr). Basics of computer programming in FORTRAN, emphasizing scientific applications; one- and two-dimensional arrays, functions, subroutines. Coreq: Math 180.

CS **112 Introduction to Problem Solving and Programming** (3 cr). Satisfies core requirement J-3-c. Intro to fundamental problem solving techniques using the computer; use of a programming language, structured programming concepts; use of fundamental data types, including arrays and records; basic concepts of computer organization, editing, and program execution; programming lab in which the student solves problems using Pascal. Prereq: high school algebra.

CS **113 Program Design and Algorithms** (3 cr). Further problem-solving and design methods used in computer science; problem definition and analysis; preliminary design methods, module analysis and refinement methods, cohesion, coupling, top down design; internal and external program documentation; intro to algorithm analysis, cost and complexity concepts; discussion and comparison of several well-known algorithms for searching, sorting, text, and numeric processing. Lab work reqd. Prereq: CS 112; coreq: Math 176.

CS **200 Sophomore Seminar** (0 cr). Curriculum options, elective courses, preparation for grad study, and current technical topics. Field trip may be reqd. Graded P/F.

CS **204** (s) **Special Topics** (cr arr). Prereq: perm.

CS **213 Data Structures** (3 cr). Intro to abstract data types, linear lists, linked lists, stacks, queues, graphs, and trees; methods for implementing, and algorithms for manipulating these types; dynamic memory methods; additional searching and sorting algorithms that result from using these data types; intro to files, including sequential, random access, and indexed processing; application of these concepts in the lab to provide further experience in the program design process. Prereq: CS 113 and Math 176.

CS **220** (s) **Programming Language** (3 cr, max arr). Intro to computer programming in a selected language; one language taught each term from the following: PL/1, Ada, C, and others. Prereq: CS 105 or 112.

CS **241 Computer Organization** (4 cr). Computer structure, machine language, addressing and programming techniques; use and operation of assemblers, linkage editors, loaders, and compilers; use of macros; systems programming using system calls; comparison of assembly language implementations with implementations using high level languages, such as C. Three lec and one lab a wk. Prereq: CS 113 and Math 176.

CS **299** (s) **Directed Study** (cr arr). Prereq: perm.

CS **307 History of Calculating** (3 cr). Open to all students; may not be used as a technical elective for CS majors. Exploration of numerical problems that created demands for better calculating devices, from the abacus to the supercomputer. Prereq: upper-div standing.

CS **310 Computing Languages** (3 cr). Major features of good programming languages, with primary emphasis on language features and their role in writing good software; programming language design alternatives; various types of languages, including procedure, data-flow, functional, and object-oriented languages. Prereq: CS 213.

CS **311 Scientific Computing** (3 cr). Engineering and scientific computing methods; design and computer implementation of various numerical algorithms in FORTRAN; computer solutions to linear and nonlinear problems; iteration as a solution method. Prereq: CS 213, Math 190.

CS **324 Computer Graphics** (3 cr). Use of the computer to define, store, manipulate, and display 2-D and 3-D objects; 2-D curvefitting and 3-D surface dev. Prereq: CS 105, or CS 112 and Math 160 or 180 and trig or perm.

CS **334 Advanced COBOL Programming** (3 cr). Indexing and use of tables, COBOL sort feature, report writer, subroutines, and access methods. Prereq: CS 103.

CS **341 Computer Operating Systems** (4 cr). Analysis and design of methods used by operating systems to perform typical system services; design and implementation of file and directory systems; I/O methods, including programmed, interrupt-driven, and DMA; CPU scheduling; memory management tech and implementations; concurrent programming; deadlocks; protection mechanisms; distributed systems; lab component focuses on implementation of several designs and algorithms discussed in lec. Three lec and one lab a wk. Prereq: CS 241.

CS **351 Computer Architecture** (3 cr). Evolution and classification of computer structures; ALU, CPU, memory, I/O, and microprogram control; conventional, stack, array, pipeline, and multiple processor architectures; fault-tolerant, data-base, and special purpose architectures; VLSI influence on architecture. Prereq: CS 241, CompE 340.

CS **360 Files and Databases** (3 cr). Theory of basic file structure and storage to include direct and indexed files, direct access hash algorithms, B-tree indexing; B+-trees, multikey processing update anomalies, normalization, relational, hierarchical, and network structural DBMS's. Prereq: CS 213.

CS **H370** (s) **Seminar** (2 cr). Computer science issues. Prereq: perm of director of University Honors Program.

CS **J381/J581 Software Engineering** (3 cr). Current topics in development of software systems; software life cycle model, requirements definition, design, validation and verification, and project management techniques. Additional projects/assignments reqd for grad cr. Prereq: perm.

CS **398 Computer Science Cooperative Internship** (1-3 cr, max 3). Supervised internship in professional computer science settings, integrating academic study with work experience; requires formal plan of activities before co-op assignment and final written report evaluated by on-campus faculty members. Graded P/F. Prereq: perm.

CS **400-401 Senior Seminar** (0 cr). Tech topics, employment practices, and interviewing. Graded P/F. One lec a wk. Prereq: sr standing in CS.

CS **404** (s) **Special Topics** (cr arr). Prereq: perm.

CS **J420/J520 Data Communication Systems** (3 cr). Concept and terminology of data communications, equipment, protocols, architectures; transmission alternatives, regulatory issues, network pricing and management. Additional projects/assignments reqd for grad cr.

CS **J422/J522 Distributed Processing Systems** (3 cr). Analysis and design of multiprocessor and geographically dispersed computer systems; allocation of processing functions, distributed data bases, and resource management. Additional projects/assignments reqd for grad cr. Prereq: CS 341.

CS **430 System Modeling and Simulation I** (3 cr). Intro to a discrete simulation language, queueing models, random number generation, design and analysis of systems. Prereq: CS 103, 105, or 112 and Stat 251 or 301 and Math 160 or 180.

CS **445 Systems Program Design** (3 cr). Algorithms used by the following system software: assemblers, macro-processors, interpreters, and compilers; compiler design options and code optimization; all concepts implemented in major programming assignments. Prereq: CS 241, 310.

CS **J461/J561 Data Base Management Systems** (3 cr). Theory of relational and distributed data base systems, query optimization techniques, and current issues in DBMS development. Additional projects/assignments reqd for grad cr. Prereq: CS 360.

CS **J470/J570 Artificial Intelligence** (3 cr). Concepts and techniques involved in artificial intelligence, Lisp, goal-directed searching, history trees, inductive and deductive reasoning, natural language processing, and learning. Extra term paper reqd for cr in 570. Prereq: CS 213 or perm.

CS **471 Expert Systems** (3 cr). Open to all students; may not be used as a technical elective for CS majors. Theory and practice of knowledge engineering; knowledge acquisition, representation, programming, project development and evaluation; individual project reqd. Prereq: CS 103, 105 or 112 and Stat 251 or 301 and Math 160 or 180.

CS **480 Design—Individual Project** (3 cr). Formal development techniques applied to definition, design, coding, testing, and documentation of a computer programming project; each student completes an individual project. Two lec a wk; significant lab work reqd. Prereq: Eng 317 and sr standing in CS.

CS **481 Design—Group Project** (3 cr). Application of formal design techniques to development of a large computer science project performed by students working in teams. Significant lab work reqd. Prereq: CS 480.

CS **J484/J584 Software Quality Assurance** (3 cr). Actions necessary to provide confidence that a software product conforms to established technical requirements; strategies for implementation and management of SQA, product reviews, test plans and procedures,

audits, configuration management, and reliability assessment; concepts of software quality. Additional projects/assignments reqd for grad cr. Prereq: CS J381/J581.

CS **490 Theory of Computation** (3 cr). See Math 485.

CS **495 Analysis of Algorithms** (3 cr). See Math 405.

CS **499** (s) **Directed Study** (cr arr). Prereq: perm.

CS **500 Master's Research and Thesis** (cr arr). Prereq: perm.

CS **502** (s) **Directed Study** (cr arr). Prereq: perm.

CS **504** (s) **Special Topics** (cr arr). Prereq: perm.

CS **520 Data Communication Systems** (3 cr). See CS J420/J520.

CS **521 Computer Network Design** (3 cr). Design of optimal and near-optimal network topologies; capacity and flow assignment; performance analysis of networks; routing, flow control, and congestion algorithms. Prereq: CS J420/J520.

CS **522 Distributed Processing Systems** (3 cr). See CS J422/J522.

CS **530 System Modeling and Simulation II** (3 cr). Analysis of simulation data; input data analysis, verification and validation of models; output analysis; applications to computer system modeling and analysis. Prereq: CS 341 and 430.

CS **545 Syntax of Programming Languages** (3 cr). Context free and regular languages; parsing by recursive descent and the theory of LL and LR parsing; error repair and recovery. Prereq: CS 445 or perm.

CS **558 Supercomputing** (3 cr). See EE 548.

CS **561 Data Base Management Systems** (3 cr). See CS J461/J561.

CS **570 Artificial Intelligence** (3 cr). See CS J470/J570.

CS **572 Advanced Topics in Artificial Intelligence** (3 cr). One topic each semester, such as expert systems, knowledge representation, machine learning. Prereq: CS J470/J570.

CS **573 Computational Linguistics** (3 cr). Analysis and computational representation of syntactic and semantic structures representing meanings of English and other natural languages; comparison with similar structures of formal languages; current natural language processing systems. Prereq: CS 490 or 545, and J470/J570.

CS **580 Graduate Project** (1-6 cr, max 6). Application of formal design and documentation techniques to the development of computer programming project; project selected in consultation with student's major professor. Prereq: CS J381/J581, 480 or perm.

CS **581 Software Engineering** (3 cr). See CS J381/J581.

CS **582 Software Metrics** (3 cr). Use of quantitative and qualitative models of cost, schedule, reliability, and quality for large-scale software systems development; survey of recent research and application. Prereq: CS J381/J581.

CS **584 Software Quality Assurance** (3 cr). See CS J484/J584.

Curricular Requirements

COMPUTER SCIENCE (B.S.C.S.)

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
CS 112 Introduction to Problem Solving & Programming	3
CS 113 Program Design & Algorithms	3
CS 200 Sophomore Seminar	0
CS 213 Data Structures	3
CS 241 Computer Organization	4
CS 310 Computing Languages	3
CS 341 Computer Operating Systems	4
CS 351 Computer Architecture	3
CS 360 Files & Databases	3
CS 400-401 Senior Seminar	0
CS 445 Systems Program Design	3
CS 480, 481 Design	6
CS 490 Theory of Computation	3
CS 495 Analysis of Algorithms	3
EE 340 Digital Logic	3
EE 344 Logic Circuit Lab	1
Eng 317 Technical & Engineering Report Writing	3
Math 176 Discrete Mathematics	4
Math 180, 190 Analytic Geometry & Calculus I, II	8
Math 330 Linear Algebra	3
Stat 301 Probability & Statistics	3
Technical electives	18
A minimum of 3 cr in upper-division math courses A minimum of 9 cr in upper-division CS courses The remaining 6 cr may be in upper-division CS, EE, or math courses, or an approved set of courses may be taken to gain an area of emphasis; no more than 3 cr in 499 courses	
Science electives	12
At least 3 courses selected from approved courses; must incl Phys 210/212 and a two-semester sequence in a lab science	
Other electives	21
A minimum of 15 cr in humanities and social sc that satisfy regulation J-3-d	
A minimum of 6 cr from an approved list of courses that include study in humanities, social sciences, arts, and other disciplines that serve to broaden student's background	
Electives to complete 128 cr for the degree	—

Technical and undesignated electives may be chosen to allow students to develop individualized programs to meet personal and career goals. Emphasis areas include, but are not limited to, software engineering, artificial intelligence, information systems, theoretical computer science, and computer graphics. A list of suggested electives for these areas is available from the Computer Science departmental office. Other areas may be developed by the student with the approval of the CS faculty.

Academic Minor Requirements

COMPUTER SCIENCE MINOR

Course	Credits
CS 112 Introduction to Problem Solving & Programming	3
CS 113 Program Design & Algorithms	3
CS 213 Data Structures	3
CS 241 Computer Organization	4
Math 176 Discrete Mathematics	4
Upper-division electives in computer science	6

Department of Counseling and Special Education

Jeanne Christiansen, Dept. Chair (Education 111).

Counseling Faculty: Thomas N. Fairchild, William Gibson, W. Harold Godwin, John M. Griffin, Jr., Thomas E. Hipple, Martha A. Kitzrow, James D. Morris, Charles R. Morrison, Bruce M. Pitman, Joan Pulakos, Thomas Trotter, Gerald L. Tuchscherer, Beth Waddell.

Special Education Faculty: Diane M. J. Baumgart, Jane P. Callahan, Jeanne Christiansen, N. Dale Gentry, Jennifer J. Olson, A. Lee Parks.

Counseling and special education are human service fields in which professionals work with children and adults to promote intellectual, academic, physical, social, emotional, and personal growth. The study of human behavior and the theories underlying human development and change are critical areas addressed in these programs. The processes and practices used to enhance growth are studied in classroom and clinical settings. Program graduates are prepared for public school, public agency, and private agency positions.

The counseling program at the University of Idaho offers preparation at the master's level for individuals seeking preparation as counselors in school and community settings. The programs may be used to meet state school certification endorsements (school and vocational counselors) and placement on the national registry (National Certified Counselor). Specialist-level programs meet Idaho school certification requirements in school psychology and advanced counseling, and licensure requirements for counseling in private practice. Doctoral level programs prepare individuals for advanced clinical, supervisory, administrative, and counselor education positions.

The special education program offers training at undergraduate and graduate levels. The undergraduate program prepares teachers to work with students who have intellectual, emotional and/or behavioral, language, sensory and/or motor impairments. Special education is characterized by the study of behavioral, assessment, and curriculum principles that, when applied systematically, result in improved performance of students eligible for special education services. Content focuses on the application of best practices in instruction, the arrangement of the teaching environment for maximum learning, and systematic evaluation of student performance.

At the master's level, the graduate program in special education provides advanced training in such areas of specialization as severe handicaps, secondary-vocational training, early childhood special education, and consulting teacher. The specialist degree is designed to prepare personnel in the consulting, supervisory, and administrative competencies needed for leadership roles in public school special education programs. The doctoral program prepares special educators for positions of leadership in schools, state agen-

cies, colleges, and universities. Major emphasis is placed on research, university level teaching, and leadership skills.

The counseling program offers graduate curricula leading to Master of Science (M.S.) and Master of Education (M.Ed.) degrees in counseling. At the specialist level the Specialist in Counseling and Human Services degree is available for counselors, and the Specialist in School Psychology degree for those preparing as school psychologists. Doctoral degrees, Doctor of Philosophy (Ph.D.) and Doctor of Education (Ed.D.), in education with a counseling major are offered to those seeking advanced graduate preparation. These programs are fully accredited by the Council for the Accreditation of Counseling and Related Education Programs (CACREP), the National Council for the Accreditation of Teacher Education (NCATE), and the National Association of State Directors of Teacher Education and Certification (NASDTEC). The school psychology program is accredited by NASDTEC and the National Association of School Psychologists (NASP/NCATE).

Degrees available in special education include: B.S. in Education, Master of Science (M.S.), Master of Education (M.Ed.), Specialist in Special Education, Doctor of Philosophy (Ph.D.) and Doctor of Education (Ed.D.). The programs are certified by the National Council for the Accreditation of Teacher Education (NCATE) and National Association of State Directors of Teacher Education and Certification (NASDTEC).

Faculty members in the department are available to discuss programs in detail with interested persons. Requests for information or appointments can be made by letter or telephone call (208/885-6159) to the department.

Courses

COUNSELING AND HUMAN SERVICES

Couns **200** (s) **Seminar** (cr arr). Prereq: perm.

Couns **203** (s) **Workshop** (cr arr). Prereq: perm.

Couns **204** (s) **Special Topics** (cr arr).

Couns **299** (s) **Directed Study** (cr arr). Prereq: perm.

Couns **400** (s) **Seminar** (cr arr). Prereq: perm.

Couns **403** (s) **Workshop** (cr arr). Prereq: perm.

Couns **404** (s) **Special Topics** (cr arr).

Couns **J405/J505** (s) **Professional Development** (cr arr). Professional development and enrichment of certificated school personnel. Cr earned will not be accepted toward grad degree programs, but may be used in a fifth-yr program. Additional projects/assignments reqd for grad cr.

Couns **432 Orientation to Counseling** (2 cr). Exploratory course for students considering entering counseling profession; successful completion of course is one criteria for final admission to the master's program in counseling and human services. Focus on counselor's role and function, the counselor as a person, ethical considerations, and other issues; involves small group work and role playing; assessment of knowledge and skills acquired.

Couns **464 Vocational Guidance** (3 cr). See VocEd 464.

Couns **499** (s) **Directed Study** (cr arr). Prereq: perm.

Couns **500 Master's Research and Thesis** (cr arr).

Couns **501** (s) **Seminar** (cr arr). Prereq: perm.

Couns **502** (s) **Directed Study** (cr arr). Prereq: perm.

Couns **503** (s) **Workshop** (cr arr). Prereq: perm.

Couns **504** (s) **Special Topics** (cr arr).

Couns **505** (s) **Professional Development** (cr arr). See Couns J405/J505.

Couns **510 Individual Appraisal I** (3 cr) (Couns 520). Analysis of statistical, psychometric, sociometric, and clinical principles essential to successful application of informal and standardized assessment in counseling and human services; current issues, such as cultural, gender, and other individual differences. Prereq: perm.

Couns **511 Individual Appraisal II** (1 cr) (Couns 528). Application of informal and standardized assessment in various professional settings in counseling and human services; case studies on active clients conducted in accordance with prescribed procedures. Prereq: Couns 510 and perm.

Couns **512 Techniques of Counseling I** (3 cr) (Couns 525). Overview of prevailing theories of counseling; study of predominant approaches, with emphasis on person-centered/existential/gestalt and cognitive/behavioral approaches; didactic and experiential activities to model applications of techniques. Prereq: perm.

Couns **513 Techniques of Counseling II** (2 cr). Review of pertinent counseling theories, stages of the developmental helping process, interpersonal skill building, establishing personal approach. Prereq: Couns 512 and perm.

Couns **514 Career Development and Lifestyle Planning** (3 cr) (Couns 460). Same as VocEd 514. Career development theories, occupational and educational information and systems, career and leisure counseling, life-style and career decision-making, and career development program planning, resources, and evaluation. Prereq: perm.

Couns **515 Counseling in the Schools** (3 cr) (Couns 415). Analysis of developmental approach to school counseling through in-depth study of its potential for application in educational settings; procedures to plan, design, implement, and evaluate developmental school programs are emphasized. Prereq: perm.

Couns **516 Counseling in the Community** (3 cr) (Couns 417). General orientation to environment or system in which community counseling is provided; specific and unique counseling knowledge and skills for use in these settings. Prereq: perm.

Couns **517 Group Counseling** (2 cr) (Couns 526). Principles, ethics, stages, overview of techniques and theories of counseling in groups. Prereq: Couns 512 and perm; coreq: Couns 518.

Couns **518 Group Counseling Lab** (1 cr) (Couns 527). Growth in self-selected area and group skills by participation in counseling group as a member. One 2-hr lab a wk.

Couns **519 Social and Cultural Foundations in Counseling** (2 cr). Studies of societal changes and trends, human roles, societal subgroups, cultural mores and social interaction patterns, and differing lifestyles. Prereq: perm.

Couns **561 Organization and Administration of Guidance Services** (3 cr). Simulated planning, implementation, and evaluation strategies primarily for those anticipating responsibility for administration of counseling services in public schools or public agencies. Prereq: perm.

Couns **562 Introduction to School Psychology** (3 cr). History, role and status, and current issues.

Couns **565 Theories of Counseling** (3 cr). Consideration and evaluation of contemporary theories. Prereq: Couns 512 and perm.

Couns **568 Group Counseling Practicum** (cr arr). Involves co-leading groups and debriefing of the group process. Prereq: Couns 512, 517, and perm.

Couns **597** (s) **Practicum in Counseling** (2 cr) (Couns 529). Minimum of 100 hrs of closely supervised experience as counselor in a professional setting; includes minimum of 40 hrs of direct contact with clientele, 10 hrs of which must be audio/videotaped by student and critiqued by assigned university faculty and approved supervisors; weekly supervision by site supervisor plus 1 hr individual and 1-1/2 hrs group supervision a wk by university personnel. Prereq: Couns 510, 512, 514, and perm.

Couns **598** (s) **Internship** (cr arr). For adv grad students. Currently offered in counselor education, counselor supervision, college counseling, college student personnel services, school special services, school psychology, school counseling, agency counseling, and private counseling practice. Prereq: perm.

Couns **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Couns **600 Doctoral Research and Dissertation** (cr arr).

SPECIAL EDUCATION

SpEd **190** (s) **Special Education Lab** (1-3 cr, max 3). Supervised observation and participation with exceptional persons. Graded P/F.

SpEd **200** (s) **Seminar** (cr arr). Prereq: perm.

SpEd **204** (s) **Special Topics** (cr arr).

SpEd **275 Education of Exceptional Individuals** (3 cr) (C). Intro to the education of exceptional individuals, including the mentally retarded, learning disabled, physically handicapped, deaf or hearing impaired, blind or visually impaired, emotionally disturbed/behavior disordered, communication disordered, health impaired, and gifted or talented; application of systematic instructional practices to different exceptionalities, ages, and degrees of handicapping conditions. Prereq: soph standing; coreq: SpEd 190 or perm.

SpEd **290** (s) **Special Education Lab** (1-3 cr, max 3). See SpEd 190.

SpEd **299** (s) **Directed Study** (cr arr). Prereq: perm.

SpEd **323 Behavioral Principles: Educational, Social, and Emotional Implications for Exceptional Individuals** (3 cr). Intro to behavioral principles; their implications in the education, social, and emotional development of exceptional individuals emphasized; includes both theoretical and applied aspects. Prereq: SpEd 275.

SpEd **377 Instructional Programming for Exceptional Individuals** (3 cr). Analysis of the goals of special education programs; application of the principles of learning to individualization of instruction for exceptional individuals, including curriculum selection, assessment, formulation of objectives, instructional planning and intervention, evaluation of student progress for instructional decisions, summative evaluation, and classroom organization and management; emphasis on instructional strategies and procedures. Prereq: SpEd 275, 323, or perm; coreq: SpEd 290 or perm.

SpEd **378 Curriculum Development for Exceptional Individuals** (3 cr). Design of curriculum for exceptional individuals, including selection, adaptation, and use of instructional sequences, materials, and equipment; procedures will be considered for task analysis, evaluation, and development of curriculum materials; use of educational technology in curriculum development, including storage-retrieval systems for accessing information. Prereq: SpEd 275, 323, and 377 or perm; coreq: SpEd 390 or perm.

SpEd **390** (s) **Special Education Lab** (1-3 cr, max 3). See SpEd 190.

SpEd **400** (s) **Seminar** (cr arr). Prereq: perm.

SpEd **403** (s) **Workshop** (cr arr). Prereq: perm.

SpEd **404** (s) **Special Topics** (cr arr).

SpEd **J405/J505** (s) **Professional Development** (cr arr). Professional development and enrichment of certificated school personnel. Cr earned will not be accepted toward grad degree programs, but may be used in a fifth-yr program. Additional projects/assignments reqd for grad cr.

SpEd **410 Individual Differences in the Classroom** (2 cr). Individual differences of children including differences of culture, gender, learning style, social and emotional interactions, and physical capabilities, including students with handicapping conditions; curriculum, adaptations, and resources used to maximize learning of all students.

SpEd **421 Family and Community Involvement in Education of Exceptional Individuals** (3 cr). Orientation to involvement of parents and families in education of exceptional individuals, as well as to school and community resources; emphasizes parent-teacher conferencing skills, home-school programming, and identification and use of school and community resources; skills in serving as liaison person with other disciplines and professionals serving the exceptional individual. Prereq: SpEd 275, 323 or perm.

SpEd **425 Diagnostic Evaluation of the Exceptional Individual** (3 cr). Diagnostic procedures for identifying behavioral and educational deficits in individuals with special learning programs. Prereq: SpEd 377 or 378, 323, or perm.

SpEd **450 Individuals with Behavioral Disorders** (3 cr). Provides a framework for identifying, describing, and managing behaviors that are frequently associated with children/youth who are considered learning disabled, or behaviorally disordered, or who exhibit behavior problems; includes discussions of etiological models, definitions of deviant behavior and learning disabilities, and service delivery models. Prereq: SpEd 275, 323, or perm.

SpEd **ID477 Generating Curriculum: Focus on Students with Moderate and Severe Disabilities** (3 cr) (SpEd 476). WSU Sp Ed 439. Philosophic assumptions for curricular assessment; use of curricular assessment strategies including at least job-skill inventories, ecological inventories, and parent inventory strategies; instructional strategies, classroom management, and staffing procedures; legal issues in special education. Prereq: SpEd 377 or perm.

SpEd **WS478 Instructional Content and Issues: Focus on Students with Moderate and Severe Disabilities** (3 cr). WSU Sp Ed 440.

SpEd **480 Practicum** (7 or 14 cr). Dual majors enroll for 7 cr; single majors for 14 cr. Directed teaching in classes for exceptional individuals. Graded P/F. Prereq: admission to teacher education, 2.5 GPA, and perm of dept. (Submit application to director of clinical experiences in teacher education by December 1 of school year before enrolling.)

SpEd **487 Communication Disorders of Exceptional Individuals** (3 cr). Survey of the theory, characteristics, assessment, and remediation of common communication disorders including articulation, voice, stuttering, language, and nonverbal comm. Prereq: SpEd 275 or perm.

SpEd **497 Teaching Gifted Individuals** (3 cr). Identification and teaching of gifted individuals in public schools. Prereq: SpEd 275 or perm.

SpEd **499** (s) **Directed Study** (cr arr). Prereq: perm.

SpEd **500 Master's Research and Thesis** (cr arr).

SpEd **501** (s) **Seminar** (cr arr). Prereq: perm.

SpEd **502** (s) **Directed Study** (cr arr). Prereq: perm.

SpEd **503** (s) **Workshop** (cr arr). Prereq: perm.

SpEd **505** (s) **Professional Development** (cr arr). See SpEd J405/J505.

SpEd **522 Diagnostic and Remedial Instruction** (3 cr). Methods and materials; problems of acceleration as well as retardation. Prereq: SpEd 425 or perm.

SpEd **540 Behavior Analysis in Applied Settings** (3 cr). Principles of behavior analysis; concepts, early application; current issues. Two lec and one 2-hr lab a wk. Prereq: SpEd 323 or perm.

SpEd **541 Special Education Trends and Issues** (3 cr). Current problems and issues in education of exceptional individuals; alternative solutions to those problems; research bearing on problems and solutions; may include broader social issues in addition to education. Prereq: SpEd 275 or perm.

SpEd **542 Guidance of Exceptional Individuals** (3 cr). Personal and social problems of exceptional individuals and their families; techniques of working with them; working with parent groups. Prereq: SpEd 275, 421, or perm.

SpEd **543 Survey of Physical and Medical Aspects of Handicaps** (3 cr). Orientation to physical and medical aspects of handicapping conditions; how they influence people; symptomatology; incidence; causation; remediation. Prereq: SpEd 275 or perm.

SpEd **545 Community Service Seminar** (3 cr). Analysis of needed ancillary services; planning for and implementing services; role of the educator on the interdisciplinary team. Prereq: SpEd 275 or perm.

SpEd **546 Assessment and Management of Learning Disorders** (3 cr). Assessment, management, and intervention with children and youth with learning disorders/disabilities. Prereq: SpEd 275 and 323 or perm.

SpEd **548 Special Education Curriculum** (3 cr). Problems of programming for the handicapped; different curriculum approaches; practice in developing curricula for handicapped individuals. Prereq: SpEd 275, 377, 378, or perm.

SpEd **549 Language Development and Disorders** (3 cr). Study of language development and disorders of children and adults including phonology, morphology, syntax, semantics, and pragmatics; emphasis on normal development and diagnosis and remediation of language. Prereq: SpEd 275 and 487 or perm.

SpEd **551 Education of Emotionally Disturbed Individuals** (3 cr). Definitions and characteristics of different categories of emotional disturbance; assessment, intervention, and evaluation approaches for individuals with emotional disturbances/behavior disorders; emphasis given to more severe problems. Prereq: SpEd 323, equiv or perm.

SpEd **560 Curriculum Development in Early Childhood Special Education I** (3 cr). Typical and atypical development from birth to six years in areas of social and self concepts, language development and disorders, and cognitive and psychological development; assessment and curriculum approaches for each area within legal guidelines of Public Law 99-457.

SpEd **561 Curriculum Development in Early Childhood Special Education II** (3 cr). Typical and atypical development from birth to six years in areas of physical development, self-care, and medical/biological functioning; assessment and curriculum approaches for each area within legal guidelines of Public Law 99-457.

SpEd **562 Interdisciplinary Coordination in Early Childhood Special Education** (3 cr). Techniques and strategies for working cooperatively with variety of agencies that serve children with handicapping conditions and their families; focus on effective transitioning stages across agencies for children and their families; includes a practicum stressing interdisciplinary services for children with handicapping conditions. Two lec and 2 hrs of lab a wk.

SpEd **ID577 Education for Students with Moderate and Severe Disabilities** (3 cr). WSU Sp Ed 539. Research studies and curriculum strategies, their impact on curriculum, and new trends; use of curricular assessment strategies (ecological inventories, job skill and parent inventories) and how to differentiate them from diagnostic strategies and to correlate results with philosophic assumptions, principles of normalization, and legal requirements of special education.

SpEd **WS578 Instructional Content and Issues: Focus on Students with Moderate and Severe Disabilities** (3 cr). WSU Sp Ed 540.

SpEd **597** (s) **Practicum** (cr arr). Prereq: perm.

SpEd **598** (s) **Internship** (cr arr). Supervised field experience in an appropriate public or private agency. Graded P/F. Prereq: perm.

SpEd **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

SpEd **600 Doctoral Research and Dissertation** (cr arr).

Curricular Requirements

SPECIAL EDUCATION (B.S.Ed.)

Required course work includes the university requirements (see regulation J-3), the general requirements for students preparing to teach at the elementary or secondary level, and the following courses (which will qualify the student for the Exceptional Child Certificate and Generalist endorsement):

Course	Credits
SpEd 190, 290, 390 Special Education Lab (1 cr each)	3
SpEd 275 Education of Exceptional Individuals	3
SpEd 323 Behavioral Principles	3
SpEd 377 Instructional Program for Exceptional Individuals	3
SpEd 378 Curriculum Development for Exceptional Individuals	3
SpEd 421 Family & Community Involvement	3
SpEd 425 Diagnostic Evaluation of the Exceptional Individual	3
SpEd 480 Practicum	9
SpEd 487 Communication Disorders of Exceptional Individuals	3
Psych 311 Abnormal Psychology	3

And the satisfactory completion of one of the following options:

A. Completion of all requirements for the B.S.Ed. degree in secondary ed (leads to certification in both secondary ed and special ed); or

B. Completion of all requirements for the B.S.Ed. degree in elem ed (leads to certification in both elem ed and special ed); or

C. Completion of one subject matter minor and an approved minor in elem ed (leads to certification in special ed but not in elem ed; certification in elem ed requires completion of all requirements specified for elem ed majors).

CRIMINAL JUSTICE—see Department of Sociology and Anthropology

DANCE—see Division of Health, Physical Education, Recreation and Dance

Department of Economics

Jon R. Miller, Dept. Head (342A Admin. Bldg.). Faculty: Richard B. Coffman, Michael J. DiNoto, S. M. Ghazanfar, Catherine A. Hofmann, John W. Knudsen, R. Ashley Lyman, Jon R. Miller, John T. Wenders.

Economics deals with how people choose among alternatives and then exchange with others based on these choices. Because many choices are made in the private sector of the economy, economics majors study consumer behavior, business behavior, and the workings of markets. Because many other choices are made in the public sector, economics majors study public finance, government decision-making, and the behavior of bureaucracies. Problems of inflation, unemployment, economic growth and development, regional and labor economics, and international trade are also studied.

However, because choice and exchange are basic to much human activity, the tools of economics are applicable to many areas of human behavior other than those conventionally thought of as economic. Increasingly, economic concepts are being used in other disciplines such as business, law, political science, history, and the social sciences. Thus, in addition to providing an understanding of economic phenomena, economics also provides a discipline of mind and an approach that are widely applicable. For these reasons, economics is often chosen as a major by students who do not intend to become professional economists. Economics has traditionally been attractive as a major to those preparing for careers in business, MBA study, law school, government, and public administration. Many successful business and professional people have majored in economics as undergraduates.

The wide applicability of economic training also means that there are many employment opportunities for professional economists. Careers as a professional economist usually require graduate training. The undergraduate majors provide an opportunity to prepare for successful graduate work. Students intending to attend graduate school in economics are expected to consult with faculty members for specific advice on their undergraduate course selections.

The department offers three undergraduate economics degree programs, one of the College of Business and Economics and two in the College of Letters and Science. The essential difference among these programs is that those in the College of Letters and Science require fewer business courses and allow more electives. The less structured programs in this college are in the liberal arts tradition. A minor in economics is also offered through the College of Letters and Science.

The Department of Economics also offers an integrated course of graduate study oriented toward policy analysis and applied studies. Two types of master's degrees are offered: (1) a thesis degree, which provides specialized research experience for careers requiring such expertise, and (2) a nonthesis degree, which provides a broader background for careers where research competence may be desirable but is not of primary importance.

Applicants for graduate study in economics are considered on the basis of their prior academic performance and their potential for success in the program. The undergraduate degree need not be in economics, though a minor in economics is desirable. Students with a minimal background in economics will be required to take certain undergraduate courses that may not be included in the graduate study plan.

Economics Courses

Note: Enrollment in 300- and 400-level economics courses is restricted to students who have completed at least 58 credits. In addition, CBE students must have earned at least a 2.4 GPA in the CBE predictor courses.

No course (CBE or outside the college) that is required in a CBE student's major may be taken by CBE undergraduates on a P/F basis, with the exception of courses that are taught only on a P/F basis. Only upper-division CBE courses used as free electives may be taken by CBE undergraduates on a P/F basis.

Econ **100 Contemporary Economics** (3 cr). Economic issues and the economic principles involved. One semester survey course for nonmajors; less technical than Econ 151 and 152. Carries no cr after Econ 151 and 152.

Econ **151, 152 Principles of Economics** (3 cr) (C). Satisfies core requirement J-3-d. May be taken in either order. Econ 151: organization and operation of American economy; supply and demand, money and banking, macroeconomic analysis of employment, aggregate output, and inflation, public finance, and economic growth. Econ 152: microeconomic principles governing production, price relationships, and income distribution. Econ 151 and 152 carry only two cr each after 100. May involve some evening exams.

Econ **204** (s) **Special Topics** (cr arr).

Econ **272 Foundations of Economic Analysis** (4 cr). Satisfies core requirement J-3-d. Not open to students who have taken Econ 151 and 152 or equivalent. Concepts underlying micro- and macroeconomic analysis. Econ 272 carries only three cr after 100. Prereq: Math 111 and 160 or equiv.

Econ **299** (s) **Directed Study** (cr arr).

Econ **321 Intermediate Microeconomic Analysis** (3 cr). Theory of the consumer, firm, industry, market, price determination, and allocation of productive resources. Honors section covering additional selected topics offered fall semester. Prereq: Econ 151 and 152 or perm.

Econ **372 Intermediate Macroeconomic Analysis** (3 cr). Theory of the economy as a whole; national income accounting as a tool of analysis; national output and income, employment, price levels, and growth. Honors section covering additional selected topics offered spring semester. Prereq: Econ 151 and 152 or perm for regular sections; Econ 321 or perm for honors section.

Econ **399 Economics Internship Program** (1-3 cr, max 6). Enrollment restricted to economics majors; may not be used to fulfill upper-division economics requirement in any of the three economics degree programs. Graded P/F. Relevant learning experience in business and government. Prereq: perm.

Econ **400** (s) **Seminar** (cr arr). Prereq: perm.

Econ **402** (s) **Workshop** (cr arr). Prereq: perm.

Econ **403 Money and Banking** (3 cr) (C). Influence of money and banking on economic activity; influence of monetary policies to achieve society's econ goals. May include evening exams. Prereq: Econ 151 and 152 or 272.

Econ **404** (s) **Special Topics** (cr arr).

Econ **J405/J505 History of Economic Thought** (3 cr). Development of economic thought; special focus on selected schools, including Greeks, Scholastics, Mercantilists, Physiocrats, Classicals, and neo-Classicals. Prereq: Econ 151 and 152 or 272.

Econ **409 Public Finance** (3 cr). Role of government in a market economy; public choice and collective decision-making; tax-shifting and incidence; structure and economics of federal taxes; governmental budgeting; public dept; special topics. Prereq: Econ 151 and 152, or 272.

Econ **410 State and Local Government Finance** (3 cr). Fiscal federalism and the role of state-local jurisdictions, patterns and determinants of expenditures, structure and economic effects of revenue sources (e.g., sales, income, property taxation), urban fiscal problems, intergovernmental relations, and future trends. Prereq: Econ 151 and 152 or 272.

Econ **415 Market Structure and Governmental Policy** (3 cr). Analysis of economic behavior under different market structures, e.g., competition, monopoly, oligopoly, monopsony, oligopsony, bilateral monopoly and cartels; theory of contestable markets; antitrust; regulation; selected case studies. Prereq: Econ 152 or 272 or perm.

Econ **416 Economics of Regulation** (3 cr). Analysis of rationale and effects of governmental regulation of marketplace; alternative theories of regulation; theories of market failure and governmental failure; rent seeking and dissipation; public utilities; selected case studies. Prereq: Econ 152 or 272 or perm.

Econ **430 Regional/Urban Economics** (3 cr). Location of economic activity, transportation problems, resource and product distribution methods, urban structure and growth, and related policy issues. Prereq: Econ 151 and 152 or 272.

Econ **433 Introduction to Econometrics** (3 cr). Same as Stat 433. Use of quantitative techniques to analyze and test economic theories. Prereq: Stat 251 or equiv stat, and Math 160 or 180.

Econ **435 American Economic Development** (3 cr). Patterns and causes of change in the American economy from colonial times to the present. Prereq: Econ 100 or 151 and 152 or 272.

Econ **436 Economic and Business Forecasting** (3 cr). Same as Bus 436. Economic and statistical analysis with forecasting techniques (e.g., economic indicators, decomposition, time series, and regression) for economy, region, industry, and firm; computer applications. Prereq: Econ 151, 152, and Stat 251.

Econ **441 Labor Economics** (3 cr). Structure and composition of the labor force, wages and employment, human resources, income-maintenance program, and related policy issues. Prereq: Econ 151 and 152 or 272.

Econ **474 International Economics** (3 cr). Analysis of international trade and financial transactions; trade policy; foreign exchange markets; adjustment processes; and international monetary system. May include evening exams. Prereq: Econ 151 and 152, or 272.

Econ **477 Economics of Developing Countries** (3 cr). Same as AgEc 477. Characteristics of underdevelopment; historical perspective; theories and policies; development problems, e.g., poverty and income distribution, population, urban-rural migration and unemployment, agriculture, trade, aid, investment, debt; future prospects. Prereq: Econ 151 and 152, or 272, or perm.

Econ **485 Environmental Economics** (3 cr). Theory of externalities and public goods, and application of economic principles to environmental issues. Prereq: Econ 152 or 272 or perm.

Econ **490 Comparative Economic Systems** (3 cr). International comparisons of the origin, development, and attributes of the world's economic systems. Prereq: Econ 100 or 151 and 152 or 272.

Econ **493-494 Seminar in Urban Studies** (2 cr). See Inter 493-494.

Econ **499** (s) **Directed Study** (cr arr).

Econ **500 Master's Research and Thesis** (cr arr).

Econ **501** (s) **Seminar** (cr arr). Prereq: perm.

Econ **502** (s) **Directed Study** (cr arr). Prereq: perm.

Econ **504** (s) **Special Topics** (cr arr).

Econ **505 History of Economic Thought** (3 cr). See Econ J405/J505.

Econ **507 Research Methodology** (3 cr). See AgEc 507.

Econ **509 Advanced Microeconomic Theory I** (3 cr). Same as AgEc 509. Neoclassical theory of consumption, production, distribution, and capital; development and use of comparative static tools of analysis. Prereq: Econ 321 or perm.

Econ **510 Advanced Microeconomic Theory II** (3 cr). Same as AgEc 510. Current development in microeconomic theory and policy. Prereq: Econ 509 or perm.

Econ **522 Advanced Aggregate Economics** (3 cr). Same as AgEc 522. Theory of national income determination and stabilization policy in a monetary economy. Prereq: Econ 372 or perm.

Econ **524 Theory of Economic Development** (3 cr). Macrodynamic theory as it relates to economic growth; conditions for and process of economic development and its significance to new areas and underdeveloped areas. Prereq: Econ 321 and 372.

Econ **525 Econometrics** (3 cr). See AgEc 525.

Econ **526 Economics of Business Decisions** (3 cr). Carries no credit after Econ 509 or 510. Applied microeconomics, covering topics such as theory of demand, production, cost, forecasting, capital budgeting. May involve some evening exams. Prereq: perm.

Econ **597** (s) **Practicum** (cr arr). Prereq: perm.

Econ **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Curricular Requirements

ECONOMICS (B.S.Bus.)

This program is offered through the College of Business and Economics.

Students preparing for professional careers as economists in private business, government service, or careers where a broad knowledge of economics is useful should elect this curriculum.

Required course work includes the university requirements (see regulation J-3), the college requirements, and:

Course	Credits
Econ 321 Intermediate Microeconomic Analysis	3
Econ 372 Intermediate Macroeconomic Analysis	3
Additional upper-division cr in economics	15
Upper-division courses in related field areas, with approval of the dept, e.g., courses required in a social science minor or related courses	9

ECONOMICS (B.A.)

This program is offered through the College of Letters and Science.

Required course work includes the university requirements (see regulation J-3), the general College of L & S requirements for the B.A. degree, and:

Course	Credits
Econ 151, 152 Principles of Economics	6
Econ 321 Intermediate Microeconomic Analysis	3
Econ 372 Intermediate Macroeconomic Analysis	3
Acctg 201 Principles of Accounting	3
Math 111 Finite Mathematics or Math 140 Pre-calculus Algebra & Analytic Geom and Phil 211 Logic	4-6
Stat 251 Principles of Statistics	3
Upper-division credits in economics	18
Upper-division credits in anthro, geog, hist, political sc, psych, or soc (at least 9 credits in one social sc)	15

ECONOMICS (B.S.)

This program is offered through the College of Letters and Science.

Required course work includes the university requirements (see regulation J-3), the general College of L & S requirements for the B.S. degree, and:

Course	Credits
Econ 151, 152 Principles of Economics	6
Econ 321 Intermediate Microeconomic Analysis	3
Econ 372 Intermediate Macroeconomic Analysis	3
Econ 433 Intro to Econometrics or 436 Econ & Business Forecasting	3
Acctg 201 Principles of Accounting	3
Math 111 Finite Mathematics	4
Math 160 Survey of Calculus or 180 Analytic Geometry & Calculus I	4
Stat 251 Principles of Statistics	3
Upper-division cr in economics	15
Upper-division social sc credits (credits earned in math beyond the stated requirement will be accepted)	15

Academic Minor Requirements

ECONOMICS MINOR

This academic minor is offered through the College of Letters and Science.

Course	Credits
Econ 151, 152 Prin of Econ or 272 Foundations of Econ Analysis	4-6
Econ 321 Intermediate Microeconomic Analysis	3
Econ 372 Intermediate Macroeconomic Analysis	3

And one of the following areas (with the permission of the student's adviser, the student may petition to have one substitute course for one of the following specific courses):

Forecasting

Econ 403 Money & Banking	3
Econ 433 Introduction to Econometrics	3
Econ 436 Economic & Business Forecasting	3

Public Policy

Econ 409 Public Finance or 410 State & Local Govt Finance	3
Econ 415 Market Structure & Govt Policy	3
Econ 435 American Econ Dev or 490 Comparative Econ Systems	3

Development

Econ 430 Regional/Urban Economics	3
Econ 474 International Economics	3
Econ 477 Economics of Developing Countries	3

Economic Resources

Econ 441 Labor Economics	3
Econ 485 Environmental Economics	3
Course approved by student's adviser	3

EDUCATION—see Division of Teacher Education

Department of Educational Administration

Lowell D. Jackson, Dept. Chair (510 Educ. Bldg.). Faculty: Jack L. Dawson, Gary Delka, Richard D. Gibb, Lowell D. Jackson, Carolyn Reeves, Roger Reynoldson, Stephen R. Rowley, Edward C. Woolums.

The Department of Educational Administration provides programs for the preparation of school administrators and for persons interested in teaching or administration in institutions of higher learning. Master's, specialist, and doctoral degrees may be earned in the department.

It is widely acknowledged that leadership is a key ingredient in effective schools. The development of leadership capabilities is enhanced by systematic study of factors that contribute to the human, conceptual, and technical skills required for effective leadership.

The department offers an array of courses that draw on significant research and experience in management and the supervision of instruction. The training program for prospective school principals includes courses in personnel administration, the principalship, research interpretation and use, the organization and administration of schools in America, supervision, school law, curriculum design, and interpersonal relations. Certification as a school principal accompanies successful completion of master's degree requirements in school administration.

At the specialist degree level, the training emphasis is aimed at superintendent certification for students who have master's degrees in administration. Students with master's degrees in related fields may achieve principal certification with a specialist degree.

The specialist degree further expands leadership training in school/community relations, school facilities planning, school finance, curriculum evaluation, and theory in administration. Persons seeking certification in these programs must also enroll as interns for two semesters. All certification and degree programs require comprehensive examinations.

At the doctoral level, the department offers individualized programs of study leading to Ed.D. or Ph.D. degrees. Programs may be directed to administration or teaching in higher education or toward significant leadership positions in public schools and other related agencies.

Persons interested in degree programs or administrative certification programs should contact the dean of the College of Education or members of the departmental faculty.

Educational Administration Courses

EdAd **500 Master's Research and Thesis** (cr arr).

EdAd **501** (s) **Seminar** (cr arr). Prereq: perm.

EdAd **502** (s) **Directed Study** (cr arr). Prereq: perm.

EdAd **504** (s) **Special Topics** (cr arr).

EdAd **505** (s) **Professional Development** (cr arr). Professional development and enrichment of certificated school personnel. Cr earned will not be accepted toward grad degree programs, but may be used in a fifth-yr program.

EdAd **506 Elementary Educational Administration** (3 cr). Patterns of organization in grades K-6; problems and techniques. Prereq: teaching credential.

EdAd **508 Secondary Educational Administration** (3 cr). Problems of organization, administration, and supervision of the secondary school; problems of small high schools.

EdAd **ID&WS509 Educational Administration** (2-3 cr). WSU Ed Ad 580. Principles and problems of organization and administration of American education, including local, regional, and state systems.

EdAd **534 The Principalship** (3 cr). Prepare students for assuming the role of elementary or secondary school principal; emphasis on skills reqd for confidence in the role of principal.

EdAd **ID&WS535 School Finance** (3 cr). WSU Ed Ad 585. Theory and application of financing schools; application to Idaho schools. Prereq: EdAd 509.

EdAd **587 The Superintendency** (2 cr). Prepare students for assuming the role of superintendent of schools; emphasis on research-based role expectation and practical guidelines for superintendent behavior.

EdAd **591 Administration of Personnel** (3 cr). Selection, placement, and evaluation of teachers and administrators; salary schedules; school policies; teacher organizations and related matters.

EdAd **592 School-Community Relations** (3 cr). Interpreting the schools to the public, two-way flow of ideas between school and community.

EdAd **593 School Facilities Planning and Maintenance** (3 cr). Planning new school facilities; facility maintenance; legal provisions involving financing; preliminary surveys of need; relationships with architects and contractors.

EdAd **594 Theory in Educational Administration** (3 cr). Theories from psychology, sociology, and cultural points of view applied to school administration; problem solving/decision making; case study approach. Prereq: EdAd 509.

EdAd **595 Higher Education** (3 cr). College and university education in the U.S.; history, objectives, organization, finance, instructional methods, faculty, and student problems.

EdAd **596 Collective Negotiations for Teachers** (3 cr). Collective negotiations in public education; recognition of bargaining agent; appropriate unit; unit determination; representation and recognition procedures; scope and process of negotiations; bargaining and impasse procedures; collective agreements; impact of collective negotiations.

EdAd **598** (s) **Internship** (cr arr). Interns assigned for two semesters to practicing administrators in elementary or secondary schools or in district offices or in appropriate offices in higher education. Graded P/F. Prereq: substantial completion of certification program.

EdAd **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

EdAd **600 Doctoral Research and Dissertation** (cr arr).

Department of Electrical Engineering

Joseph J. Feeley, Dept. Chair (214 Buchanan Engr. Lab.). Faculty: David H. Atkinson, Howard B. Demuth, Joseph J. Feeley, Calvin L. Finn, James F. Frenzel, Karen Z. Frenzel, Earl E. Gray, George G. Hespelt, John Law, Joseph D. Law, Douglas W. Lynn, Gary K. Maki, James N. Peterson, John E. Purviance, Richard W. Wall, Sterling R. Whitaker.

The Department of Electrical Engineering provides students the opportunity to receive a solid education in the fundamentals of electrical circuits, electronics, and electrical machines, as well as to explore advanced topics through technical elective courses taken primarily in the senior year. Included in the curriculum is a heavy emphasis on mathematics, along with courses in physics, chemistry, technical writing, humanities, and social sciences. This program, leading to the degree of Bachelor of Science in Electrical Engineering, produces graduates with the technical skills needed for stepping into challenging careers with a wide variety of companies and for continuing their education in new and changing areas.

The Department of Electrical Engineering, in cooperation with the Department of Computer Science, also offers a Bachelor of Science in Computer Engineering. This program, which includes intensive study of basic courses in electrical engineering and computer science, was created in response to high employer demand for computer engineering graduates.

Graduates in electrical engineering can expect to be involved with applying technical skills and knowledge to problems in such areas as energy, computers, instrumentation, microprocessors, electrical power, electronics, and communication systems. The range of needs in these, as well as other, areas that use electrical engineers provide career opportunities in design, production, reliability and quality control, research and development, marketing and sales, education, technical management, and plant operations. Continued strong demand for electrical engineering graduates suggests that employment opportunities will be excellent in selected areas.

Electrical and computer engineering are extremely rewarding fields; they also are demanding occupations. The high-school student planning to enter an engineering career should prepare for entrance into UI by taking at least three years of mathematics (including advanced algebra and trigonometry) and three years of natural science (including chemistry and physics). Deficiencies in high school can be made up on campus, but only at the cost of a delay in the regular degree program.

On campus, the freshman year is about the same for all engineering students. It is a busy year of adjustment and background acquisition involving the study of graphics and written communication, introductory calculus, chemistry, physics, and computer programming.

During the sophomore and junior years, the EE student continues with his or her academic program. This program is developed by consultation with an academic adviser from the EE departmental faculty. After taking introductory electrical circuits classes and laboratory classes that allow students to experiment with electrical circuits and become familiar with laboratory instruments, students study topics in electronics, electrical machines, digital logic and microprocessors, electromagnetic fields, and analysis of signals and dynamic systems. Additional laboratory classes during this time further develop the student's understanding of concepts presented in lecture classes while introducing some of the practical problems that arise in hardware.

As a senior, the student will take a two-semester sequence in electrical engineering design that involves both individual and team design projects. Also during the senior year the student selects technical elective courses primarily from the advanced elective courses that are offered in electrical engineering. These include specialized topics in digital logic and design, computer methods in electrical power systems, feedback control systems, advanced electronics, communication theory, analysis and applications of microprocessors, and antennas and microwave devices.

Eighteen credits of technical elective courses are required by the Electrical Engineering Department. Twelve of these eighteen credits must be upper-division electrical engineering courses, including at least nine credits from the following list of courses: EE 411, 421, 435, 440, 452, 470. The remaining six credits of technical electives must be selected from upper-division courses in electrical engineering or appropriate supporting areas. These support areas include mechanical engineering, civil engineering, chemical engineering, engineering science, computer science, physics, mathematics, and statistics.

The eighteen credits of technical electives are separate from, and in addition to, the required three credits of engineering science electives that must be chosen from upper-division courses.

The Department of Electrical Engineering has offices and laboratory rooms in two campus buildings, the Buchanan Engineering Laboratory (BEL) and the Johnson Electrical Laboratory (JEL). The seven laboratories consist of electronics, senior design, digital logic, and computers in BEL, and electrical circuits, microwaves, and electrical machines in JEL. In addition, laboratory space is used for microprocessor system development and testing. The computer laboratory includes a large number of desk-top personal computer systems, a minicomputer system with many terminals, microprocessor instructional systems, and several specialized computer systems for developing microprocessor software and other dedicated computing.

Note: In addition to college requirements for admission to classes (see "Admission to Classes" under College of Engineering, part four), students majoring in electrical engineering must pass a qualifying examination as prerequisite to any upper-division course in electrical engineering except EE 340 and EE 344. Adviser's approval is required for admission to all EE courses.

Courses

COMPUTER ENGINEERING

CompE **340 Digital Logic** (3 cr). See EE 340.

CompE **344 Logic Circuit** Lab (1 cr). See EE 344.

CompE **440 Digital Systems Engr** (3 cr). See EE 440.

CompE **441 Computer Organization** (3 cr). See EE 441.

CompE **480-481 Computer Systems Design Projects** (3 cr). Application of formal software and hardware design techniques, hardware/software interface considerations, project management, economics, reliability, and patents; projects require a combination of hardware and software system design, working model, and oral and written report. Two lec a wk; significant lab work reqd. Prereq for CompE 480: EE 316, 317; CompE 340, 344; CS 213, 241, 130; or perm. Prereq for CompE 481: EE 350, CompE 441, 480, and CS 341, or perm.

ELECTRICAL ENGINEERING

EE **C010 Elementary Electrical Theory** (0 cr) (C). Basic electrical theory and circuits for electrical employees based upon the background of high school algebra, geometry, and physics. Content equivalent to 2 cr for fee purposes.

EE **204** (s) **Special Topics** (cr arr).

EE **207 Introduction to Electrical Engineering** (3 cr). Not open for cr to electrical engineering majors. Power and energy concepts, circuit analysis, transient and steady state behavior, resonant systems, system analysis; elem differential equations will be introduced to solve basic transient problems. Prereq: Math 190, Phys 211.

EE **210 Electrical Circuits I** (3 cr). Intro to d.c. and transient electrical circuits; mesh and nodal analysis; dependent sources; circuit theorems; transient analysis with differential equations. Three lec and one recitation a wk. Coreq: Math 310, Phys 211.

EE **211 Electrical Circuits Lab I** (1 cr). Lab to accompany EE 210. Lab experiments and computer simulations. One 3-hr lab a wk. Coreq: EE 210, Phys 213.

EE **212 Electrical Circuits II** (4 cr). Continuation of EE 210. Intro to sinusoidal steady state circuits; time and frequency domain analysis; Laplace and Fourier transforms and Fourier series; transfer functions, Bode plots, filters, transformers, polyphase circuits. Four lec and one recitation a wk. Prereq: EE 210, Math 310, Phys 211.

EE **213 Electrical Circuits Lab II** (1 cr). Lab to accompany EE 212. Continuation of EE 211. Lab experiments and computer simulations. One 3-hr lab a wk. Prereq: EE 211, Phys 213; coreq: EE 212.

EE **241 Basic Microprocessor Systems** (0 cr). Machine language programming, overview of current microprocessor technology. Graded P/F.

EE **242 Microcomputer Programming** (0 cr). Use of minicomputer operating system, incl program creation, execution, use of system utilities, and system facilities; programming done in FORTRAN. Prereq: CS 105.

EE **292 Sophomore Seminar** (0 cr). Curriculum options, elective courses, preparation for graduate study, and current technical topics. Field trip may be reqd. Graded P/F.

EE **314 Electronic Systems** (3 cr). Not open for cr to electrical engineering majors. Electronic devices and systems. Three lec a wk. Prereq: EE 210 or 207.

EE **315**—see "Background Courses" below.

EE **316 Electronics I** (3 cr). Intro to application of electronic devices in electrical networks: diodes, rectifiers, power supplies, and thermal management; bipolar junction transistor principles, biasing, modeling and low-frequency, small signal applications; field effect transistor principles, biasing, modeling, and low-frequency, small-signal applications; operational amplifier fundamentals and applications. Prereq: EE 212, 213.

EE **317 Electronics I Lab** (1 cr). Lab to accompany or follow EE 316. Prereq or coreq: EE 316.

EE **318 Electronics II** (3 cr). Electronic amplifier frequency response (magnitude and phase); RC coupled amplifiers in cascade; large-signal amplifiers; implications of saturation and cut-off; feed-back amplifiers; intro to analog IC implementation. Prereq: EE 316, 317.

EE **319 Electronics II Lab** (1 cr). Lab to accompany or follow EE 318. Prereq or coreq: EE 318.

EE **320 Electric Machinery** (5 cr). Theory and application of electric machinery and transformers. Four lec and one 3-hr lab a wk. Prereq: EE 212, 213, Phys 211.

EE **321**—see "Background Courses" below.

EE **324 Electric Machinery** (3 cr). For nonmajors. Magnetic circuits and electromechanical energy converting systems; theory and characteristics of common AC and DC machinery. Two lec and one 3-hr lab a wk. Prereq: EE 210 or 207.

EE **330 Electromagnetic Theory** (4 cr). Vector calculus; electrostatics, electrodynamics; electromagnetic waves in isotropic media; Maxwell's equations; boundary value problems. Prereq: Math 200, 310, Phys 211.

EE **331**—see "Background Courses" below.

EE **340 Digital Logic** (3 cr). Same as CompE 340. Number systems, truth tables, logic gates, flip-flops, combinational and synchronous sequential circuits using SSI, MSI, and programmable devices; intro to digital systems and basic microprocessor architecture; certification exam not reqd.

EE **341**—see "Background Courses" below.

EE **344 Logic Circuit Lab** (1 cr). Same as CompE 344. Open lab to accompany EE 340. Design and construction of combinational and synchronous sequential logic circuits; certification exam not reqd. One 1-hr lec a wk.

EE **350 Signal and Systems Analysis** (4 cr). Continuous and discrete time signal and system analyses; Fourier transforms, z-transforms, filtering, sampling and modulation; intro to state space methods and feedback control. Prereq: EE 212.

EE **351**—see "Background Courses" below.

EE **401 Advanced Circuit Theory** (3 cr). Passive and active electrical networks; frequency response and complex frequency domain analysis, includes pole-zero considerations, root locus, and sensitivity functions. Prereq: EE 212, 213.

EE **404** (s) **Special Topics** (cr arr).

EE **405 Transmission Lines** (3 cr). Transmission of signals and power in distributed parameter circuits; characteristic impedances, attenuation, phase shift, reflections, and Smith charts. Prereq: EE 212, 213.

EE **410 Electronics II** (3 cr). Modern microelectronics technology; thin film and thick film electronics circuits; advanced electronic devices. Prereq: EE 316, 318, 330.

EE **J411/J511 Pulse and Digital Circuits** (3 cr). Electronic switching, timing, and pulse-shaping techniques; logic functions, realization with diodes, transistors, and FETs. Additional projects/assignments reqd for grad cr. Prereq: EE 316, 318, and access to and familiarity with "SPICE" simulation program.

EE **J413/J513 Communication Circuits** (3 cr). Noise calculations and consideration in communication circuits, matching networks and impedance transformations, small signal HF amplifiers, sinewave oscillators, mixers and frequency changers, amplitude modulators and detectors, frequency modulators and discriminators, "linear" power amplifiers, tuned power amplifiers. Additional projects/assignments reqd for grad cr. Prereq: EE 318 and access to and familiarity with "SPICE" simulation program.

EE **J414/J514 Analog Integrated Circuit Analysis and Design** (3 cr). Alt/yrs. Extension of biasing and signal analysis, active current sources and loads, frequency response analysis and compensation techniques and analysis of currently available integrated circuits. Additional projects/assignments reqd for grad cr. Prereq: EE 316.

EE **J415/J515 Advanced Integrated Circuit Analysis and Design** (3 cr). CMOS technology, modeling and subcircuits plus amplifier, comparator and converter analysis and design. Additional projects/assignments reqd for grad cr. Prereq: EE 316.

EE **416 Linear Integrated Circuit Applications** (3 cr). Alt/yrs. Theory and practical implementation of operational amplifiers, voltage regulators, video amplifiers, and special purpose integrated circuits such as modulators, demodulators, phase locked loops, nonlinear circuits, charge-transfer devices, transducers, and optoelectronic circuits. Prereq: EE 318 or perm.

EE **418 Basic Instrumentation Techniques** (3 cr). Sensor types and selection, signal conditioning, environmental considerations, isolation requirements of signal, power and logic systems; linearity and compensation concepts. Two lec and one 3-hr lab a wk. Prereq: EE 316, 318, 330 or perm.

EE **J419/J519 Microprocessor Based Instrumentation** (3 cr). Electric transducers, instrumentation amplifiers, computer interfacing, real-time data acquisition, A-D/D-A use, control applications, noise, and safety restrictions. Additional projects/assignments reqd for grad cr. Two lec and one lab a wk. Prereq: EE 316, 318, 340.

EE **420 Direct Energy Conversion** (3 cr). Direct energy conversion devices; solar cells, fuel cells, thermoelectric and thermionic devices; solar thermal electricity, flat plate collectors, solar energy utilization. Prereq: EE 330 and Phys 360 or perm.

EE **421 Introduction to Power Systems** (3 cr). Power and energy relationships in power systems, multiphase generators, lines and transformers; power system representation, network solution, and intro to symmetrical components. Prereq: EE 320.

EE **422 Power Systems Analysis** (3 cr). Principles of load flow, fault and stability analysis; computer methods; load flow and econ dispatch. Prereq: EE 421.

EE **435 Microwave Engineering** (3 cr). Intro to transmission line theory, impedance matching, Smith Chart; N-port descriptions, microwave amplifiers, resonators and sources; ntennas and their properties; measurement techniques. Two lec and one 3-hr lab a wk. Prereq: EE 330 or perm.

EE **440 Digital Systems Engineering** (3 cr). Same as CompE 440. Advanced topics in combinational logic design such as iterative logic arrays, hazard free design, and VLSI logic implementations; study of asynchronous and synchronous sequential circuits, combinational and sequential circuit design with PLA's; register transfer language design of digital systems including data path and control structures with TTL including timing analysis. Prereq: EE 340, 344.

EE **441 Computer Organization** (3 cr). Same as CompE 441. Register transfer language design of micro and mini computer systems; micro and mini architectures including interrupt structures and software control; 8-bit and 16-bit microprocessor design including associated interfacing with RAM, ROM, and I/O. Prereq: EE 340.

EE **442 Microprocessor System Software** (3 cr). Use of microprocessor development system, high level language programming with C or PL/M, assembler language programming, in-circuit-emulation, data structures relative to microprocessors, algorithms in developing microprocess software, including interrupt control; software design methods. Prereq: EE 340; coreq: EE 441.

EE **443 Microcontrollers** (3 cr). Computer arch, combinational and synchronous logic design and implementation; basic software considerations and hardware designs for microprocessor-based controllers. Prereq: EE 340; coreq: EE 442.

EE **445 Introduction to VLSI Design** (3 cr). Principles of design of very large scale integrated circuits; CMOS logic design; transistor sizing and layout methodologies; intro to IC CAD tools. Prereq: EE 316, 340 or perm.

EE **446 System Modeling and Simulation** (3 cr). Mathematical modeling using physical laws and empirical data; computer simulation methods; simulation of dynamical systems; use of computer simulation models; probability concepts in simulation; optimization methods. Prereq: EE 350 or perm.

EE **R448 Advanced Assembler Language and Operating Systems** (3 cr). EXCP and CHANNEL programs, user-written SVC's, user-written program interrupt, I/O buffering tech, channel end appendage, conditional coding, and Macro writing. Prereq: perm.

EE **452 Communication Systems** (3 cr). Linear and exponential modulation, noise, digital communication systems, intro to information theory. Prereq: EE 350.

EE **455 Coding and Information Theory** (3 cr). Intro to coding: error-detecting codes, error-correcting codes, source codes, modulation codes, applications; intro to information theory; entropy, mutual information, channel capacity. Prereq: EE 350.

EE **465 Control Engineering** (3 cr). For nonmajors. Continuous systems; transient response; frequency response; root locus; stability. Prereq: EE 207 and familiarity with basic Laplace transforms.

EE **470 Control Systems** (3 cr). Control system design, frequency and time domain methods; performance specifications; computer control and computer-aided design. Prereq: EE 350.

EE **476 Digital Filtering** (3 cr). Design methods for recursive and non-recursive filters; frequency domain characteristics; computer-aided design; applications. Prereq: EE 350.

EE **477 Digital Process Control** (3 cr). See ChE 445.

EE **480-481 Senior Design** (3 cr). Computer-aided techniques, economics, marketing, reliability, and patents; projects require original design, working model, and report. Two lec and one 3-hr lab a wk. Prereq for EE 480: EE 318, 319, 320, 340, 344, or perm. Prereq for EE 481: EE 330, 350, 480, or perm.

EE **486 Solid-State Electronics** I (3 cr). Physical electronics; diode and transistor models; noise mechanics. Prereq: EE 330.

EE **491 Senior Seminar** (0 cr). Technical topics, employment practice, and interviewing. One lec a wk; one 3-6 day field trip may be required. Graded P/F.

EE **493 Thesis** (3 cr, max 6). Original investigation or dissertation upon some subject in electrical engineering. Prereq: sr standing and perm.

EE **499** (s) **Directed Study** (cr arr). Prereq: perm.

EE **500 Master's Research and Thesis** (cr arr).

EE **501** (s) **Seminar** (cr arr). Prereq: perm.

EE **502** (s) **Directed Study** (cr arr). Prereq: perm.

EE **504** (s) **Special Topics** (cr arr).

EE **505 Analysis of Nonlinear Systems** (3 cr). Approximations; parameter space methods; describing functions; Krylov-Bogoiubov asymptotic method; Lyapunov Stability; absolute stability; Lure problem; Popov's circle criterion. Prereq: EE 572 or perm.

EE **507 Computer-Aided Network Design** (3 cr). Digital computers in design of electrical networks; constrained and unconstrained optimization in network design. Prereq: perm.

EE **511 Pulse and Digital Circuits** (3 cr). See EE J411/J511.

EE **512 Active Network Synthesis** (3 cr). Pole-zero positioning with dependent sources; realization techniques for second order filter functions using active devices; transfer function approximation for higher-order systems; function transformations, intro to switched-capacitor techniques. Prereq: EE 401 and SPICE access, or perm.

EE **513 Communication Circuits** (3 cr). See EE J413/J513.

EE **514 Analog Integrated Circuit Analysis and Design** (3 cr). See EE J414/J514.

EE **515 Advanced Integrated Circuit Analysis and Design** (3 cr). See EE J415/J515.

EE **519 Microprocessor Based Instrumentation** (3 cr). See EE J419/J519.

EE **520 Advanced Electrical Machinery** (3 cr). Synchronous machines and transformers, machine transient and subtransient reactances, excitation and voltage regulation, power curves, transformer connections, impedance, harmonics, and impulse characteristics. Prereq: EE 422.

EE **521 Power System Planning and Resources** (3 cr). Major decision-making and economic factors in electrical energy systems, planning and resource selection; hydroelectric, nuclear, and fossil fuel plants, steady state and transient stability, reliability, voltage levels, economic choices, and future resource potential. Prereq: perm.

EE **523 Symmetrical Components** (3 cr). Concepts of symmetrical components, sequence impedances of devices and lines, circuit equivalents for unbalanced faults, management during faults. Prereq: EE 421.

EE **524 Transients in Power Systems** (3 cr). Voltage transients; overvoltages during faults; recovery voltage characteristics; arc restrikes, switching surges, ferroresonance, and nonlinear phenomena. Prereq: EE 422.

EE **ID&WS525 Industrial Power Systems** (3 cr). WSU E E 486. Analysis and design of industrial and commercial power systems; fault and circuit protection, voltage standards and selection, and application problems of large motors; applicable codes and standards. Prereq: EE 421.

EE **ID&WS526 Power System Protection and Relaying** (3 cr). WSU E E 511. Power system faults and applicable relay systems; review of symmetrical components as applied to fault currents and consideration of lightning and voltage surge protection. Prereq: EE 421.

EE **ID&WS530 Advanced Electromagnetic Theory I** (3 cr). WSU E E 518. Field theory, classical electromagnetics, potential theory, boundary value problems, and wave propagation. Prereq: EE 330.

EE **ID&WS531 Advanced Electromagnetic Theory II** (3 cr). WSU E E 519. Guided waves, in homogeneous wave equation, radiation, scattering, and diffraction. Prereq: EE 530.

EE **ID&WS533 Antenna Theory** (3 cr). WSU E E 527. Linear, loop, and special antennas, synthesis and arrays; microwave reflectors and lenses. Prereq: EE 531 or perm.

EE **535 Microwave Circuits** (3 cr). Waveguide systems and components, oscillators and detectors; masers, parametric amplifiers, and other related methods. Prereq: EE 531 or perm.

EE **540 Switching and Finite Automata Theory** (3 cr). Finite-state automata; functional decomposition; threshold logic; synchronous and asynchronous sequential design; sequential circuit decomposition; fault detection and diagnosis in combinational sequential machines. Prereq: EE 440.

EE **541 Design of Digital Computer Systems** (3 cr). Formal description of computer systems; multiprocessor organization, microprocessor design, self-checking microprocessor design, microprogramming; pipelined processors, distributed processors, systolic arrays in VLSI; CAD tools in implementing digital systems on a chip set, PLA-register stack configurations, pipelined/parallel VLSI architectures, reduced instruction set computers. Prereq: EE 441 or equiv.

EE **R543 Teleprocessing Systems Design** (3 cr). Components of a teleprocessing system; terminals, modems, the telecommunication network, the central site, types of teleprocessing; message switching, on-line inquiry systems, transaction-processing systems; software for teleprocessing systems; use of telecommunication packages.

EE **R544 Advanced Computer Programming Systems** (3 cr). Advanced systems software; generation of operating systems and I/O systems; advanced machine language programming.

EE **545 VLSI Design** (3 cr). Application of sampled domain techniques to design of MOS switched capacitor circuits, including both filters and non-filtering circuits; advanced digital and analog topics for high performance MOS VLSI circuits. Prereq: EE 318, 350, 445 or perm.

EE **546 VLSI Design Project** (2 cr). Design project starting from requirement definition and ending with testing of fabricated chip; design review conducted by faculty and other students. Prereq or coreq: EE 545.

EE **R547 Applied Time Series Forecasting** (3 cr). Same as Stat 547. Necessary theory for identification by building stochastic and dynamic models for designing forecasting and control schemes; emphasis on problem solving; examples used to illustrate methods; students participate in solution of specimen problems.

EE **548 Supercomputing** (3 cr). Same as CS 558. A perspective of supercomputing from von Neumann machines to neural networks; supercomputer architectures, hardware accelerators, computing applications, and research topics in parallel architectures and algorithms by speakers from industry, government, and various universities; students encouraged to perform research in supercomputing field. Prereq: computer architecture course and skills in at least two computer languages (such as Pascal, LISP, or FORTRAN), or perm.

EE **549 Fault-Tolerant Digital Systems** (3 cr). Fault detection in combinational networks, fault-tolerant design of combinational and sequential circuits, fail-safe circuits, fault-tolerant microprocessor design, testing of iterative array cells. Prereq: EE 440 or equiv.

EE **550 Communication Theory I** (3 cr). Hypothesis testing; optimum detection of signals in noise; sequential detection; estimation of signal parameters; space time processing. Prereq: perm.

EE **554-555 Information Theory I-II** (3 cr). Information and uncertainty measure; source coding; channel capacity; reliable transmission through unreliable channels. Prereq: EE 350 or perm for EE 554; perm for EE 555.

EE **ID&WS570 Random Signals and Systems** (3 cr). WSU E E 507. Probability and random processes as applied to engineering systems, correlation and power spectrum of stationary processes, harmonic analysis, linear systems analysis with stochastic inputs, Wiener-Kolmogoroff Theory, matched filters. Prereq: EE 350 and Stat 301 or 451, or perm.

EE **ID&WS571 Estimation Theory** (3 cr). WSU E E 508. Basic concepts and criteria for estimation; properties of estimators; error analysis and a priori statistics; Kalman-Bucy fil-

ter theory; colored noise; smoothing and prediction; nonlinear estimation; application to engineering systems. Prereq: EE 570 or perm.

EE **ID&WS572 Linear System Theory** (3 cr). WSU E E 501. Linear spaces and linear operators; descriptions of dynamic systems; input-output descriptions; state-space concepts; canonical forms; controllability and observability; minimal realizations; application to control and general systems analysis; pole assignment; observers. Prereq: EE 470 or equiv.

EE **ID&WS574 Optimal Control Theory I** (3 cr). WSU E E 502. Intro to optimization, parameter optimization, optimization of dynamic systems, optimization of dynamic systems with path constraints, optimal feedback control and dynamic programming, linear quadratic regulators, second variation methods, singular control problems, differential games. Prereq: EE 572 or perm.

EE **575 Optimal Control Theory II** (3 cr). Computational methods of optimization; mathematical programming; computational aspects of dynamic programming; second variation methods; algorithms for constrained minimization in function space; computational requirements; convergence properties. Prereq: EE 572 or perm.

EE **576 Digital Signal Processing** (3 cr). Digital filter characteristics; advanced digital signal processing algorithms; discrete time Fourier transform and power spectrum analysis; dedicated digital signal processors. Prereq: EE 476 or perm.

EE **577 Digital Control Systems** (3 cr). Signal sampling and hold; z-transforms and relationship with s-plane, discrete state variable equations; stability; transform and state-space design techniques; optimal control. Prereq: EE 470 or perm.

EE **586 Solid-State Electronics II** (1-3 cr, max 6). Offered in one-cr modules. Typical modules are: advanced treatment of bipolar transistors, other junction devices, metal-semiconductor devices, field-effect transistors, optoelectronic devices, Gunn oscillators and other bulk-effect devices, properties of semiconductors, and semiconductor stat and noise mechanisms. Prereq: EE 410, 486, or perm.

EE **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

EE **600 Doctoral Research and Dissertation** (cr arr).

BACKGROUND COURSES

These are not introductory-level courses. They are intended for engineers and scientists whose previous degrees are not in electrical engineering from ABET/EAC-accredited programs, who need to remove deficiencies before beginning graduate studies in electrical engineering. Students must pass a proficiency test before they may enroll in these classes.

EE **315 Background Study in Electronics** (3 cr). Not applicable toward any UI undergrad degree; valid only for removal of electronics (EE 316) deficiency for grad students who do not have BSEE background. See EE 316 for description. Graded P/F based on comprehensive exam at completion of course. Prereq: passing grade on Dept of Electrical Engineering's upper-division qualifying exam.

EE **321 Background Study in Electrical Machines** (3 cr). Not applicable toward any UI undergrad degree; valid only for removal of electrical machinery (EE 320) deficiency for grad students who do not have BSEE background. See EE 320 for description. Graded P/F based on comprehensive exam at completion of course. Prereq: passing grade on Dept of Electrical Engineering's upper-division qualifying exam.

EE **331 Background Study in Electromagnetic Theory** (3 cr). Not applicable toward any UI undergrad degree; valid only for removal of electromagnetic theory (EE 330) deficiency for grad students who do not have BSEE background. See EE 330 for description. Graded P/F based on comprehensive exam at completion of course. Prereq: passing grade on Dept of Electrical Engineering's upper-division qualifying exam.

EE **341 Background Study in Digital Computer Fundamentals** (3 cr). Not applicable toward any UI undergrad degree; valid only for removal of digital computer fundamentals (EE 340) deficiency for grad students who do not have BSEE background. See EE 340 for description. Graded P/F based on comprehensive exam at completion of course.

EE **351 Background Study in Signals and Systems Analysis** (3 cr). Not applicable toward any UI undergrad degree; valid only for removal of signals and systems analysis (EE 350) deficiency for grad students who do not have BSEE background. See EE 350 for description. Graded P/F based on comprehensive exam at completion of course. Prereq: passing grade on Dept of Electrical Engineering's upper-division qualifying exam.

Curricular Requirements

COMPUTER ENGINEERING (B.S.Comp.E.)

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
CompE 340 Digital Logic	3
CompE 344 Logic Circuit Lab	1
CompE 440 Digital Systems Engineering	3
CompE 441 Computer Organization	3
CompE 480-481 Computer Systems Design Projects	6
Chem 111 Principles of Chemistry	4
CS 112 Introduction to Problem Solving & Programming	3
CS 113 Program Design & Algorithms	3
CS 213 Data Structures	3
CS 241 Computer Organization	4
CS 310 Computing Languages	3
CS 341 Computer Operating Systems	4
EE 210, 211 Electrical Circuits I & Lab	4
EE 212, 213 Electrical Circuits II & Lab	5
EE 316, 317 Electronics I & Lab	4
EE 350 Signal & Systems Analysis	4
Eng 317 Technical & Engineering Report Writing	3
Math 176 Discrete Mathematics	4
Math 180, 190 Analytic Geometry & Calculus I-II	8
Math 310 Ordinary Differential Equations	3
Math 330 Linear Algebra	3
Phys 210, 211, 212, 213 Engineering Physics & Lab	8
Stat 301 Probability & Statistics	3
Humanities and social sciences electives (must satisfy regulation J-3 and incl at least (1) one upper-div course that is the second course completed in that subject, or (2) a course that has another humanities-social sc course as a prereq)	18
Technical electives (must be upper-div courses, incl at least 9 cr from either EE or CS courses selected from an approved list available from dept)	15
Electives	6

ELECTRICAL ENGINEERING (B.S.E.E.)

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
Courses common to engineering curricula (see part 4)	38
EE 210, 211 Electrical Circuits I & Lab	4
EE 212, 213 Electrical Circuits II & Lab	5
EE 292 Sophomore Seminar	0
EE 316, 317 Electronics I & Lab	4
EE 318, 319 Electronics II & Lab	4
EE 320 Electrical Machinery	5
EE 330 Electromagnetic Theory	4
EE 340 Digital Logic	3
EE 344 Logic Circuit Lab	1
EE 350 Signal & Systems Analysis	4
EE 480-481 Senior Design	6
EE 491 Senior Seminar	0
CE 386 Engineering Economy	3
Eng 317 Technical & Engineering Report Writing	3
ES 220 Engineering Dynamics	3
Phys 212-213 Engineering Physics Lab	2
Engineering science electives	3
Humanities and social sciences electives (must satisfy regulation J-3 and incl at least (1) one upper-div course that is the second course completed in that subject, or (2) a course that has another humanities-social sc course as a prereq)	18
Technical upper-div electives (at least 12 cr from EE courses, including 9 cr from EE 411, 421, 435, 440, 452, 470)	18

Engineering Science and General Engineering

Steven G. Penoncello, Coordinator (324 Janssen Engr. Bldg.)

The engineering sciences have their roots in mathematics and basic sciences, but carry knowledge further toward creative application. When a field of mathematics or basic science proves pertinent to an engineering application, corresponding courses in engineering science develop to afford a bridge between basic science and engineering practice. Thus, the engineering sciences form the foundation on which the applied engineering disciplines are built.

The engineering science program is one of service to the degree-granting departments of the College of Engineering and the College of Mines and Earth Resources; a degree in engineering science is not offered. Faculty members who hold appointments in one of the degree-granting departments are responsible for teaching basic engineering and engineering science courses.

Courses

ENGINEERING (GENERAL)

Engr **101 Engineering Graphics** (2 cr) (C). Freehand and computer aided drawing in pictorial and orthographic projection; section and auxiliary views; descriptive geometry; graphical presentation of data; scales, dimensioning, and measurements. Two lec and one 2-hr lab a wk.

Engr **102 Engineering Graphics** (2 cr) (C). Descriptive geometry; graphical solution of problems involving points, lines, planes, and surfaces in space. Prereq: Engr 101 or equiv.

Engr **103 Introduction to Engineering** (2 cr). Summer short course for JETS Program. Intro to engineering career opportunities through analysis of engineering design problems; includes computer graphics, programming languages, economics, and statics.

Engr **200** (s) **Seminar** (cr arr). Prereq: perm.

Engr **203** (s) **Workshop** (cr arr). Prereq: perm.

Engr **299** (s) **Directed Study** (cr arr). Prereq: perm.

Engr **394 Technology and Societal Decisions** (3 cr). Same as Inter 394. Engineering approach to decision making in society, including evaluation of alternatives based upon economic, social, and human values.

Engr **398-399 Engineering Cooperative Internship I-II** (3 cr). Supervised internship in professional engineering settings, integrating academic study with work experience; requires written report to be evaluated by student's major dept; positions are assigned according to student's ability and interest. Reqd of cooperative education students. Graded P/F. Prereq: perm.

Engr **400** (s) **Seminar** (cr arr). Prereq: perm.

Engr **403** (s) **Workshop** (cr arr). Prereq: perm.

Engr **404** (s) **Special Topics** (cr arr). Prereq: perm.

Engr **407 Professional Management for Engineers** (3 cr). Consideration of analytical, quantitative, and human functions in management science; emphasis on socioeconomic synthesis.

Engr **411 Engineering Fundamentals** (0 cr). Review of basic engineering and science material covered in Fundamentals of Engineering Exam. Graded P/F. Prereq: sr standing or perm.

Engr **495 Practicum in Tutoring** (1 cr, max 2). Tutorial service performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

ENGINEERING SCIENCE

ES **ID&WS210 Engineering Statics** (3 cr). WSU C E 211. Principles of statics with engineering applications; addition and resolution of forces, vector algebra, moments and couples, resultants and static equilibrium, equivalent force systems, centroids, center of gravity, free body method of analysis, two and three dimensional equilibrium, trusses, frames, and friction. Prereq: CS 105 or 112 or equiv, Math 190; coreq: Phys 210.

ES **ID&WS220 Engineering Dynamics** (3 cr). WSU C E 212. Particle and rigid body kinematics and kinetics; rectilinear, curvilinear, and relative motion, equations of motion, work and energy, impulse and momentum, systems of particles, rotation, rotating axes, rigid body analysis, angular momentum, vibration, and time response. Prereq: ES 210, Phys 210.

ES **310 Engineering Materials Science** (3 cr). Structure of materials; mechanical, electrical, chemical, and thermal properties of materials. Prereq: Chem 114, Phys 211.

ES **ID&WS320 Fluid Mechanics** (3 cr) (C). WSU M E 303. Physical properties of fluids; fluid statics; continuity, energy, momentum relationships; laminar and turbulent flow; boundary layer effects; flow in pipes, open channels, and around objects. Prereq: ES 210, Math 200.

ES **321 Thermodynamics and Heat Transfer** (3 cr). First and second laws of thermodynamics; thermodynamic processes; thermodynamic properties; flow processes; conversion of heat into work; conduction, convection, radiation, and heat exchangers. Prereq: ES 210, Math 200.

ES **ID&WS340 Mechanics of Materials** (3 cr) (C). WSU C E 314. Elasticity, strength, and modes of failure of engr materials; theory of stresses and strains for ties, shafts, beams, and columns. Prereq: ES 210, Math 200.

ES **402 Applied Numerical Methods** (3 cr). Approximate and numerical methods for solution of systems of linear and nonlinear equations, initial value, boundary value, and partial differential equations with practical applications, analysis of error, improvement of accuracy, and numerical and matrix techniques for computation by digital computer. Prereq: Math 310.

ES **406 Design and Analysis of Engineering Experiments** (3 cr). Experiments of evaluation and comparison, accelerated and factorial experiments, sequential, nonparametric and fatigue experiments, and analysis of data with applications to computers, propulsion, automatic control systems, air and water pollution. Prereq: college-level stat course.

ES **440 Advanced Mechanics of Materials** (3 cr). See ME J439/J539.

ES **470 Survey of Hazardous Waste Management Problems** (3 cr). Cr not granted for both ES 470 and ES J475/J575. Not applicable toward any engineering degree. Environmental, technical, political, and economic aspects of hazardous waste management. Prereq: sr standing and perm.

ES **471 Waste Treatment Technologies** (3 cr). Not applicable toward any engineering degree. Procedures for characterization of hazardous waste sites, identification and application of physical, chemical, biological, and thermal treatment. Prereq: sr standing and perm.

ES **472 Remediation Technologies and Project Implementation** (3 cr). Not applicable toward any engineering degree. Waste site remediation and restoration technologies and project dev; includes alternative technologies, containment, storage and disposal; emphasis on project development, organization, and practices for dealing with hazardous chemical, radioactive, and mixed wastes and for successful site remediation operations including administrative, legal, economic, and political considerations. Prereq: sr standing and perm.

ES **J475/J575 Hazardous Waste Management** (3 cr). Credit not granted for both ES J475/J575 and ES 470. Principles and practices of management of hazardous and solid wastes with emphasis on CERCLA (Superfund) process for cleanup of uncontrolled hazardous waste sites and RCRA process as it applies to industrial waste treatment, storage, and disposal (TSD) facilities. Additional assignments/projects reqd for grad cr. Prereq: Stat 301, sr or grad standing in sc or engr, and perm.

ES **490 Systems Analysis of Environmental Problems** (3 cr). Modeling and simulation of environmental systems; systems analysis and optimization techniques especially applied to environmental problems. Prereq: Math 310.

ES **498 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm of dept.

ES **499** (s) **Directed Study** (cr arr). Prereq: perm.

ES **504** (s) **Special Topics** (cr arr).

ES **R505 Engineering Statistics** (1-3 cr). Same as Stat 505. Theory of probability, statistics, and stochastic processes applied to selected areas of engineering. Prereq: perm.

ES **506 Hazardous Waste Management Seminar** (0 cr). Environmental engineering and science topics related to hazardous waste characterization, cleanup, and regulations; includes case histories and student presentations. Prereq: perm.

ES **540 Continuum Mechanics** (3 cr). Same as CE and ME 540. Stress and deformation of continua using tensor analysis; relationship between stress, strain, and strain rate in fluids and solids; applications. Prereq: perm.

ES **575 Hazardous Waste Management** (3 cr). See ES J475/J575.

ES **580 Environmental Law and Regulation** (3 cr). Overview of federal, state, and local environmental regulations addressing environmental impact assessment, water pollution control, air pollution control, solid and hazardous waste, resource recovery and reuse, toxic substances, pesticides, occupational safety and health, radiation, facility siting, and environmental auditing and liability; emphasis on evolution of regulations and their impacts on environmental programs relevant to scientists and engineers. Prereq: perm.

ES **590 Systems Analysis of Environmental Problems II** (3 cr). Systems analysis of environmental problems and processes, including linear, dynamic, and geometric programming; systems modeling, stochastic systems, and other optimization tech. Prereq: perm.

Department of English

Gary Williams, Dept. Chair (200 Carol Ryrie Brink Hall). Faculty: Douglas Q. Adams, Evelyn Ashton-Jones, David S. Barber, Steven R. Chandler, Jack L. Davis, Richard J. Dozier, Stephan P. Flores, Tina Foriyes, Candida Gillis, Richard G. Hannaford, Walter A. Hesford, D'Wayne Hodgin, Edward V. Hughes, Carole Lowinger, Ronald E. McFarland, Kerry E. McKeever, Barbara R. Meldrum, Lance Olsen, Sheila O'Brien, Kurt O. Olsson, Florence Roberts, Teoman Sipahigil, Charles R. Stratton, Dene Kay Thomas, Gordon P. Thomas, Roger P. Wallins, Gary Williams.

English majors develop skills in writing, textual interpretation, and critical thinking as they study the nature of language and learn how Anglo-American literary traditions develop and relate to world literature. Majors study a wide range of authors, male and female, upper class and working class, white and minority. They learn the formal qualities of texts as well as their historical and cultural contexts. Students write extensively in all courses and gain speaking experience through oral reports and class discussions.

The early phases of the program emphasize literary traditions (Eng 111, 112, 341, 342, 343, 344), reading skills and textual analysis (especially Eng 211 and 212), and the study of Shakespeare (Eng 345). Advanced courses allow students to pursue individual interests in literature, expository and creative writing, literary criticism and theory, and linguistics.

Through requirements, course offerings, and extensive advising, the English Department encourages students to plan their curricula according to personal and career goals. Aspiring poets and novelists emphasize creative writing courses; film scholars take courses in film; future teachers of English as a Second Language (ESL) study linguistics; pre-professionals of all kinds take advanced prose-writing courses. Those heading for graduate school in literature, linguistics, or ESL choose courses that prepare them for graduate study in their area. English majors who intend to teach English in secondary schools plan their program to satisfy state certification requirements (see "Secondary School Teaching Certification for Majors Outside the College of Education" in the College of Education section in part 4).

To enable students to focus on such interests within a coherent program of study, the English Department offers the choice of three emphases within the major: literature, creative writing, and preprofessional.

The Department of English offers three graduate degrees, either thesis or nonthesis, at the master's level: the standard M.A. in literature, the M.A.T., and the M.A. in English as a Second Language.

Some graduate course work in creative writing is available and qualified students may do a creative-writing thesis, but the department does not offer a graduate degree in that area. Students planning to work for the M.A. or the M.A.T. should be well prepared through the curriculum outlined below. Those planning to pursue the M.A. in English as a Second Language should take extra course work in linguistics.

English Courses

ADVANCED PLACEMENT: Courses in this subject field that are vertical in context are: Eng 103-104.

PREREQUISITES: Students may enroll for a second-semester course in English without having had the first-semester course, unless it is a stated prerequisite to the second-semester course. Eng 103 and 104 are prerequisite to all upper-division courses. A transfer student who lacks Eng 103 or 104, or both, may take either or both for credit even though he or she has already taken a literature course for which Eng 103 or 104 is prerequisite at UI.

Eng **101 ESL Grammar and Writing Lab** (0 cr). Lab review of basic grammar of written English for students who are not native speakers of English. Graded P (pass)/N (repeat).

Eng **103 Basic Skills for Writing** (3 cr). Basic principles of argumentative essay writing; strategies of prewriting, paragraphing, and sentencing; focus on thesis, audience, and rhetorical situations. Graded P (pass)/N (repeat)/F (fail). Coreq for ESL students: Eng 101.

Eng **104 Essay Writing** (3 cr). Applied principles of argumentative essay writing, in summaries and critical analyses of tests, and in the research essay; emphasis on clear, concise, and vigorous prose. Graded P (pass)/N (repeat)/F (fail). Prereq: Eng 103 or equiv. ESL students may be reqd to attend Eng 101 or additional tutorials.

Eng **111-112 Literature of Western Civilization** (3 cr). Satisfies core requirement J-3-d. Masterpieces reflecting development of Western thought and culture. Eng 111: Classical Greece to the Renaissance. Eng 112: 17th century to the present.

Eng **175 Introduction to Literature** (3 cr). Basic course in literary genres (novel, drama, poetry) to provide the general student with the terminology and standard techniques of literary explication.

Eng **205** (s) **Advanced Expository Writing** (3 cr). Satisfies core requirement J-3-a. Develops skills in reading and writing across the university curriculum; focuses on requirements of college writing; critical analyses, research, lab, and field reports, and essay exams. Prereq: Eng 104 at UI or demonstrated proficiency by exam (see regulation J-3-a).

Eng **211 Critical Approaches to Literature I** (3 cr). Major critical approaches to texts, with emphasis on more traditional approaches; concepts, techniques, terminology for analyzing literature; a writing-intensive course. Prereq: Eng 104 or equivalent.

Eng **212 Critical Approaches to Literature II** (3 cr). Major critical approaches to texts, with emphasis on more recent approaches; concepts, techniques, terminology for analyzing literature; a writing-intensive course. Prereq: Eng 104 or equivalent.

Eng **291 Creative Writing: Poetry** (3 cr). Intro to techniques of writing poetry. Graded P/F.

Eng **292 Creative Writing: Fiction** (3 cr). Intro to techniques of writing fiction. Graded P/F.

Eng **300 ESL Research Writing** (3 cr, max arr). Limited to students whose native language is not English. Research methods, scientific writing style, vocabulary grammar forms, reference citation forms, note-taking from lec, and technical lec presentations. Normally scheduled on the basis of three lec per wk; however, additional lec, lab, and/or tutorial sessions may be scheduled and reqd. Prereq: perm of dept.

Eng **301** (s) **Special Topics** (cr arr). Variable content course covering special topics of contemporary interest. Topics and number of cr will be announced in the Time Schedule.

Eng **309 Advanced Prose Writing** (3 cr). Theory and practice in writing prose; many assignments in expression, explanation, and persuasion. Prereq: Eng 104 at UI or demonstrated proficiency by exam (see regulation J-3-a).

Eng **313 Business Writing** (3 cr). Principles of clear writing related to business style; correspondence and reports; form, content, and style. Prereq: Eng 104 at UI or demonstrated proficiency by exam (see regulation J-3-a); jr standing or perm.

Eng **317 Technical and Engineering Report Writing** (3 cr). Satisfies core requirement J-3-a. Principles of clear writing related to technical style; problems such as technical description, proposals, formal reports, and technical correspondence. Prereq: Eng 104 at UI or demonstrated proficiency by exam (see regulation J-3-a); jr standing or perm.

Eng **321 The Novel for Nonmajors** (3 cr) (C). Major novels from the 18th century to the present.

Eng **325 Contemporary Literature for Nonmajors** (3 cr). Current poetry, drama, and prose; emphasis on U.S. authors.

Eng **341-342 Survey of British Literature** (3 cr). Eng 341: Beowulf to Samuel Johnson. Eng 342: Robert Burns to contemporary writers.

Eng **343-344 Survey of American Literature** (3 cr). Eng 343: Colonial beginnings to the Civil War. Eng 344: Post-Civil War to contemporary writers.

Eng **345 Shakespeare** (3 cr). Introductory course; background and study of selected plays representative of Shakespeare's achievement.

Eng **375 The Bible as Literature** (3 cr). Literary qualities of the Bible.

Eng **400** (s) **Seminar** (cr arr). Prereq: perm.

Eng **401 Writing Workshop for Teachers** (3 cr). Theory and practice of jr/sr high school composition instruction; further development of student's own writing skills. Three lec and one lab a wk. Prereq: Eng 104 or equiv.

Eng **404** (s) **Special Topics** (cr arr). Prereq: perm.

Eng **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Eng **421 Development of the English Novel** (3 cr). Major writers from the beginnings to Scott.

Eng **422 The Nineteenth-Century English Novel** (3 cr). Dickens to Hardy.

Eng **425 Irish Literary Renaissance** (3 cr). Lit of Ireland after 1880, especially Yeats, Joyce, and Synge.

Eng **426 Modern Poetry** (3 cr).

Eng **427 American Fiction, 1914-1945** (3 cr). Fiction by writers such as Cather, Dos Passos, Faulkner, Fitzgerald, Hemingway, and Wright.

Eng **428 British Fiction, 1900-1945** (3 cr). Fiction by such writers as Conrad, Forster, Joyce, Lawrence, and Woolf.

Eng **429 Contemporary Fiction** (3 cr). Fiction since 1945 by writers such as Barth, Bellow, Fowles, Lessing, Morrison, Nabokov, and Pynchon.

Eng **430 Perspectives in Film** (3 cr). Same as CommG 430. Survey of major principles and methods of film criticism as they relate to development of film art from 1890 to the present. Prereq: Inter 126 or CommG 288 or perm.

Eng **433 Chaucer** (3 cr). Intro to Chaucer's poetical works.

Eng **434 Middle English Literature** (3 cr). Middle English literature to 1500, excluding Chaucer and drama.

Eng **436 Advanced Shakespeare** (3 cr). Intensive study of a number of plays grouped according to mode, kind, theme, or the dramatist's dev. Prereq: Eng 345 or perm.

Eng **437 English Drama to 1642** (3 cr). Medieval through renaissance drama, emphasis upon Marlowe, Jonson, Webster.

Eng **438 English Drama, 1660-1800** (3 cr). Heroic play and tragedy; sentimental drama; comedy of manners.

Eng **439 Modern English and American Drama** (3 cr). Plays of the chief 20th-century dramatists.

Eng **441 Introduction to the Study of Language** (3 cr). Same as Anthr 441. Surveys of sound patterns, morphological processes and syntactic structures; questions of language acquisition, variation, and history; exercises from a variety of languages, with emphasis on American English.

Eng **442 Introduction to English Syntax** (3 cr). Structure and processes of English syntax; syntax as component of style. Prereq or coreq: Eng 441 or perm.

Eng **443 Language Variation** (3 cr). Geographic and social dialects (e.g., black English), levels of formality and their linguistic consequences; literary use of language variation (as in Dickens and Hardy, Twain and Faulkner); occupational dialects and jargons. Prereq or coreq: Eng 441 or perm.

Eng **445 Literature for Adolescents** (3 cr). Primarily for students working for teacher or library certification. Reading and appraisal of literature appropriate to the needs, interests, and abilities of adolescents.

Eng **451 Sixteenth-Century Poetry and Prose** (3 cr). Major authors of the period with emphasis on Spenser.

Eng **452 Milton** (3 cr). Major prose and poetry of Milton.

Eng **453 Seventeenth-Century Poetry and Prose** (3 cr). Major authors excluding Milton; emphasis on Bacon, Browne, Burton, Donne, Herbert, Herrick, Marvell.

Eng **456 Restoration and Eighteenth Century** (3 cr). Neoclassical poetry and prose from Dryden to Johnson.

Eng **465 The Romantic Period** (3 cr). Poetry and prose of the early 19th century; emphasis on Blake, Wordsworth, Coleridge, Shelley, Keats, Byron.

Eng **466 The Victorian Period** (3 cr). Poetry and prose; emphasis on Tennyson, Browning, Arnold, Carlyle, Newman, J. S. Mill.

Eng **470 American Literature to 1830** (3 cr). Colonial period to the early republic; emphasis on Bradford, Bradstreet, Taylor, Edwards, Franklin, Cooper, Irving.

Eng **471 Poe, Hawthorne, and Melville** (3 cr). Major works and their place in the American Renaissance.

Eng **472 Emerson, Thoreau, and Whitman** (3 cr). Major works and their place in the American Renaissance.

Eng **473 Literature of the American West** (3 cr). Writings that reflect the growth of the western U.S. from frontier days to the present.

Eng **474 American Literature, 1865-1914** (3 cr). Writers of realistic and naturalistic fiction such as James, Twain, Wharton, and Dreiser, and poets such as Whitman and Dickinson.

Eng **480 Ethnic and Minority Literature** (3 cr). Texts by ethnic and minority writers, primarily but not exclusively American; e.g., Black, Native American, Chicano, Asian American, Black South African.

Eng **481 Women's Literature** (3 cr). Literature by women; genres, nationalities, and historical periods may vary from semester to semester.

Eng **482** (s) **Major Authors** (3 cr). Comprehensive study of the works of a single author. See the Time Schedule for author.

Eng **483 Black Literature** (3 cr). Major works of U.S. Black writers; emphasis on the 20th century.

Eng **484 American Indian Literature** (3 cr). Recent poetry and prose written by and about American Indians.

Eng **491 Advanced Creative Writing: Poetry** (3 cr, max arr). Continuation of Eng 291. Prereq: Eng 291 or perm.

Eng **492 Advanced Creative Writing: Fiction** (3 cr, max arr). Continuation of Eng 292. Prereq: Eng 292 or perm.

Eng **494 Methods of Literary Criticism** (3 cr). Intro to major principles and methods of literary analysis; practice in applying critical methods to selected poems, fiction, and drama.

Eng **495 Literary Criticism** (3 cr). From Plato to the present.

Eng **496 History of the English Language** (3 cr). Evolution of the language from Proto-Germanic to American English. Prereq: Eng 441 or perm.

Eng **J498/J598 Internship** (1-3 cr). Graded P/F. Supervised experience in professional uses of English. Prereq: perm of director of grad and undergrad studies, Dept of English.

Eng **499** (s) **Directed Study** (1-3 cr, max 3). Prereq: perm.

Eng **500 Master's Research and Thesis** (cr arr). Graded P/F.

Eng **501** (s) **Seminar** (cr arr). Prereq: perm.

Eng **502** (s) **Directed Study** (1-3 cr, max 3). Normally offered in English and American literature and in linguistics; may not duplicate course offerings. Graded P/F. Prereq: perm.

Eng **503 Problems and Methods of Literary Study** (3 cr).

Eng **504** (s) **Special Topics** (cr arr). Prereq: perm.

Eng **505** (s) **Workshop** (cr arr). May be graded P/F. Prereq: perm.

Eng **506 Language and Teaching of Writing** (3 cr). Linguistic, rhetorical, stylistic, and pedagogical concepts essential to teaching college-level writing.

Eng **507** (s) **Studies in the English Language** (3 cr, max 9). Normally offered in Old English, Middle English, and Early and Late Modern English. Prereq: Eng 441, 496, or perm.

Eng **509** (s) **Creative Writing** (3 cr, max 12). Workshop for advanced writers; analysis of theory, composition, and techniques with applied goal of extending technical skills of the student writer through study of professional writers' work. All applicants must submit typed manuscripts of their work at least 10 days before registration. Prereq: perm.

Eng **ID&WS510** (s) **Studies in Linguistics** (3 cr, max 12). WSU Engl 541. Topics such as phonology, morphology, syntax, linguistic history, or the application of linguistics to the teaching of English literature or composition. Prereq: 6 cr in the following: Eng 441, 442, 443, 496, 506, or perm.

Eng **511** (s) **Studies in Literary Criticism** (3 cr, max 12). History of criticism; various schools of literary criticism. Prereq: Eng 495 or perm.

Eng **512** (s) **Studies in Literary Theory** (3 cr, max 12). Various genres (poetry, drama, fiction), forms, and modes (tragedy, comedy, satire).

Eng **513 ESL Methods I: Basic Oral/Aural Skills** (3 cr). Alt/yrs. Survey of most widely used classroom techniques for developing speaking and listening skills in a second language; alternative innovative approaches. Prereq: Eng 441 or perm.

Eng **ID&WS514 ESL Methods II: Reading, Writing, and Special Purpose English** (3 cr). WSU Engl 544. Alt/yrs. Survey of most widely used classroom techniques for developing reading and writing skills in a second language and teaching techniques to specialized professional programs. Prereq: Eng 441 or perm.

Eng **515 ESL Teaching Practicum** (3 cr). Alt/yrs. Organization and teaching of an ESL course under direction of practicum instructor. Prereq: Eng 514 or perm.

Eng **516 Intercultural Communication** (3 cr). Alt/yrs. In-depth examination of major issues related to communication across cultures: communication theory, linguistic relativity, ethnography of speech, crosscultural rhetoric, and nonverbal communication. Prereq: Eng 441 or perm.

Eng **517 Contrastive Linguistics** (3 cr). Alt/yrs. Theory and practice of comparing and contrasting linguistic systems as basis for preparing instructional materials. Prereq: Eng 441 and one of the following: Eng 442, 443, 496, 510, or perm.

Eng **518 Advanced English Grammar** (3 cr). In-depth linguistic analysis of English grammar, giving special emphasis to morphology and syntax. Prereq: Eng 441 or perm (recommended prep: Eng 442).

Eng **519 Linguistic Analysis** (3 cr). Advanced work in analysis and description of phonology, morphology, and syntax of languages. Prereq: Eng 441 or perm (recommended prep: Eng 442).

Eng **520** (s) **Studies in Medieval Literature** (3 cr, max 12). Normally offered in period survey, genre studies, and major author(s).

Eng **530** (s) **Studies in Renaissance and 17th-Century British Literature** (3 cr, max 12). Normally offered in period survey, genre studies, and major author(s).

Eng **540** (s) **Studies in Restoration and 18th Century British Literature** (3 cr, max 12). Normally offered in period survey, genre studies, and major author(s).

Eng **WS543 Topics in English Linguistics** (3 cr, max 6). WSU Engl 543.

Eng **550** (s) **Studies in 19th-Century British Literature** (3 cr, max 12). Normally offered in survey of Romantic literature, survey of Victorian literature, genre studies, and major author(s).

Eng **560** (s) **Studies in American Literature Before 1900** (3 cr, max 12). Normally offered in period survey, genre studies, and major author(s).

Eng **570** (s) **Studies in 20th-Century British and American Literature** (3 cr, max 12). Normally offered in period survey, genre studies, and major author(s).

Eng **597** (s) **Practicum** (cr arr). Prereq: perm.

Eng **598 Internship** (1-3 cr). See Eng J498/J598.

Eng **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Curricular Requirements

ENGLISH (B.A.)

Where specific courses are listed with the area requirements, the department may approve equivalencies.

Required course work includes the university requirements (see regulation J-3), the general requirements for the B.A. degree, and one of the following emphases:

LITERATURE EMPHASIS

Course	Credits
Eng 111-112 Literature of Western Civilization	6
Eng 211-212 Critical Approaches to Literature I-II	6
Eng 341-342 Survey of British Literature	6
Eng 343-344 Survey of American Literature	6
Eng 345 Shakespeare	3
400-level courses in literature before 1800	3
Courses in linguistics	3
English electives selected in consultation with adviser, incl at least 12 cr at the 400 level	18
Related field approved by adviser	20

CREATIVE WRITING EMPHASIS

Course	Credits
Eng 111-112 Literature of Western Civilization	6
Eng 211-212 Critical Approaches to Literature I-II	6
Eng 341-342 Survey of British Literature	6
Eng 343-344 Survey of American Literature	6
Eng 345 Shakespeare	3
400-level English courses in lit, incl one before 1900	6
Elective writing courses chosen from Eng 291, 292, 309 (may not be repeated), 404, 491, 492 (may be repeated)	18
Related field approved by adviser	20

PREPROFESSIONAL EMPHASIS

Course	Credits
Eng 111-112 Literature of Western Civilization	6
Eng 211-212 Critical Approaches to Literature I-II	6
Eng 341 or 342 Survey of British Literature	3
Eng 343 or 344 Survey of American Literature	3
Two writing courses chosen from Eng 205, 309, 313, 317	6
Elective English courses (at least 9 cr at 400 level)	12
Courses outside the English Dept appropriate to student's career goals (at least 9 upper-div cr)	15
Related field OR academic minor appropriate to student's career goals (at least 9 upper-div cr)	20

The preprofessional emphasis is an individualized program for students wishing to stress preparation for professions such as law, writing and editing, government service, and business. All course decisions are to be made in consultation with the student's English adviser and require the adviser's approval.

TEACHING CERTIFICATION

L&S English majors wishing secondary teaching certification must complete the appropriate English and education courses listed in the "Teaching Majors and Minors in the College of Education" section of this catalog. Some of these courses may be included in the student's English-major requirements. Students should plan their programs with their English advisers; they should also see College of Education advisers regarding certification requirements.

Academic Minor Requirements

ENGLISH MINOR

Course	Credits
Eng 211-212 Critical Approaches to Literature I-II	6
Eng 345 Shakespeare	3
Three of the following courses	9
Eng 341-342 Survey of British Literature	
Eng 343-344 Survey of American Literature	
One 400-level English course	3

ENGLISH AS A SECOND LANGUAGE MINOR

Course	Credits
Eng 404 Special Topics: ESL Methods	3
Eng 441 Introduction to the Study of Language	3
Eng 442 Introduction to English Syntax	3
Anthr/Soc 322 Racial & Ethnic Relations	3
Ed 314 Strategies for Teaching	3
Electives in English language and linguistics	6

ENTOMOLOGY—see Department of Plant, Soil, and Entomological Sciences

Department of Fish and Wildlife Resources

C. Michael Falter, Dept. Head (105B FWR Bldg.).

Fishery Resources Faculty: David H. Bennett, Ted C. Bjornn, Ernest L. Brannon, James L. Congleton, C. Michael Falter, George W. Klontz, Christine M. Moffitt, Dennis L. Scarnecchia.

Wildlife Resources Faculty: Ernest D. Ables, Edward O. Garton, Maurice G. Hornocker, Lewis Nelson, Jr., James M. Peek, Kerry P. Reese, John T. Ratti, J. Michael Scott, R. Gerald Wright.

The professions of fish and wildlife conservation deal with the application of principles of biology and ecology to the management of fish or wildlife populations and their habitats. The two professions are nearly identical in their basic approach to resource management and differ mainly in the type of environment, i.e., aquatic or terrestrial, with which they are concerned.

Fishery biologists and scientists conduct research or apply management principles to aquatic ecosystems. They may become involved with biological monitoring, environmental impact studies, area planning and preservation, maintenance of endangered fish, hatchery operation, commercial fish farming, control and prevention of fish diseases, and management of stream or lake ecosystems.

Wildlife biologists, or managers, attempt to maintain adequate populations of game and nongame wildlife species. This involves studying wildlife and its habitat so that management programs can be established on biological facts. The job often involves coordinating wildlife management programs with other natural resource activities such as forest management, range management, and land use planning.

Both professions offer opportunities in law enforcement, communications, and public relations. A common saying, and one with a great deal of truth, is that fish or wildlife management is largely people management.

Bachelor of Science degrees are offered in fishery resources and in wildlife resources. The fishery curriculum offers professional-level courses in three major areas: (1) fishery management, (2) aquatic ecology, and (3) aquaculture and fish health management, and has two curricular options, management and aquaculture. The curriculum in wildlife resources provides a broad background in natural resources and in addition offers the student an opportunity to select a field of interest in one of six options: aquatic, biology, communications, habitat, policy-law-administration, and quantitative. Elective courses in both curricula provide an opportunity to gain additional knowledge in a special area of interest or to broaden into other fields. To ensure that the student gains practical experience, one season of approved work experience or internship before graduation is required.

Fish and wildlife graduates find employment with numerous federal, state, and private agencies. These include the U.S. Fish and Wildlife Service, the Bureau of Land Management, the U.S. Forest Service, the National Marine Fisheries Service, the Army Corps of Engineers, state fish and game or conservation departments, and private organizations such as power companies, commercial fish growers, and consultants. Recent surveys have shown that baccalaureate graduates of UI obtain employment at a rate considerably above the national average.

The university offers Master of Science and Doctor of Philosophy degrees in several specialty areas of fish and wildlife resources. The M.S. (thesis option) and the Ph.D. degrees each require original research.

The research mission of the department is attainment of new knowledge and the understanding of natural resources, their interrelationships and uses. The objectives of the research program are, thus, to attain knowledge of the environment and to develop management alternatives that will assist in the conservation of resources while meeting society's needs. The dissemination of this knowledge through publications, continuing education, and other channels of communication is an essential departmental function.

For additional information, please call the department at (208) 885-6434.

Courses

FISHERY RESOURCES

PREREQUISITE: Courses in this subject field numbered above 299 are not open to any undergraduate student who is on academic probation.

Fish **102 The Fishery Resources Profession** (1 cr). Orientation of students to profession of fishery resources; employment opportunities, current research efforts in the Pacific Northwest, etc. Graded P/F.

Fish **200** (s) **Seminar** (cr arr). Prereq: perm.

Fish **203** (s) **Workshop** (cr arr). Prereq: perm.

Fish **204** (s) **Special Topics** (cr arr).

Fish **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Fish **299** (s) **Directed Study** (cr arr). Prereq: perm.

Fish **301 Aquatic Resources Management** (4 cr). Techniques of managing aquatic resources and their impacts on and by conservation agencies and private industries. Four wks of field sessions at Clark Fork facility.

Fish **390 Principles of Fish and Wildlife Ecology** (3 cr). Not open to wildlife and fishery majors. History, objectives, and principles of fish and wildlife management, interrelationships with other renewable resources. Prereq: course in ecology or perm.

Fish **397-398 Renewable Natural Resources Internship I-II** (cr arr). Supervised field experience with an appropriate public or private agency. Reqd for cooperative education students. Graded P/F. Prereq: perm of dept.

Fish **400** (s) **Seminar** (cr arr). Prereq: perm.

Fish **401 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

Fish **403** (s) **Workshop** (cr arr). Prereq: perm.

Fish **404** (s) **Special Topics** (cr arr).

Fish **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Fish **411 Ichthyology** (4 cr). See Zool 481.

Fish **ID413 Fish Ecology** (3 cr). WSU Zool 414. Principles regulating density and diversity of fishes; adaptations and interrelationships of fishes; response of fishes to environmental stress. Prereq: general ecology or perm.

Fish **415 Limnology** (5 cr). Same as Zool 435. Physical, chemical, and biological features of lakes and streams. Two lec and six hrs of lab a wk; two 1-day field trips. Prereq: ecology.

Fish **417 Aquaculture** (3 cr). Concepts and methods of extensive and intensive aquaculture in warmwater, coldwater, and marine systems. One 1-day field trip. Prereq: Fish 411.

Fish **418 Fisheries Management Techniques** (2 cr). Methods and techniques employed in fishery resources, sampling, and presentation of findings. Four days of field trips. Prereq: Fish 411 and 413, Eng 317.

Fish **419 Principles of Fisheries Management** (3 cr). Application of principles toward managing recreation and commercial aquatic resources. Prereq: Fish 418, Stat 251.

Fish **420 Fish Diseases** (3 cr). Epidemiology, diagnostics, prevention, and treatment of infectious and noninfectious diseases of free-living and confined finfish.

Fish **446 Diseases of Wild Birds and Mammals** (2 cr). See WLF 446.

Fish **495 Seminar** (1 cr). Disc integrating biological, social, political, economic, and philosophic aspects of problems in managing fishery resources.

Fish **499** (s) **Directed Study** (cr arr). For the individual student; conferences, library, field, or lab work. Prereq: sr standing, GPA 2.5, and perm.

Fish **500 Master's Research and Thesis** (cr arr).

Fish **501** (s) **Seminar** (cr arr). Major philosophy, management, and research problems of wildlands; presentation of individual studies on assigned topics. Prereq: perm.

Fish **502** (s) **Directed Study** (cr arr). Prereq: perm.

Fish **503** (s) **Workshop** (cr arr). Selected topics in the conservation and management of natural resources. Prereq: perm.

Fish **504** (s) **Special Topics** (cr arr).

Fish **506** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Fish **510 Advanced Fishery Management** (3 cr). Alt/yrs. Compensation as a phenomenon basic to exploitation; yield in numbers and weight; models of yield; stock-recruitment functions; economic yield; application of theory of physical and economic yield to empirical examples in commercial and sport exploitation. One 5-day field trip.

Fish **ID511 Fish Physiology** (4 cr). Alt/yrs. Principles and methods used to study vital organs, organ systems, growth, and reproduction of fishes; emphasis on osmoregulation, metabolism, endocrinology, and respiration. Prereq: Fish 411 and perm.

Fish **ID512 Aquatic Pollution Ecology** (3 cr). Alt/yrs. Principles and working examples of the ecology of polluted aquatic stream and lake habitats. Two 1-day field trips. Prereq: Fish 415 or perm.

Fish **513 Advanced Fish Culture** (3 cr). Alt/yrs. Principles underlying freshwater and marine fishes; emphasis on good pond design, nutrition, bioenergetics, genetics, water quality interactions. Prereq: Fish 411, 417, and perm.

Fish **514 Fish Population Dynamics** (3 cr). Alt/yrs. Models and empirical examples of density changes, competition, and predation; mechanisms controlling density and biomass; social behavior; fish production; aquatic community processes.

Fish **515 Advanced Limnology** (3 cr). Alt/yrs. Physicochemical interrelationships and dynamics of primary and secondary production in aquatic systems. Two 4-hr lec-labs a wk. Prereq: Fish 415.

Fish **516 Epidemiology and Diagnostics of Fish Diseases** (3 cr). Alt/yrs. Epidemiology, etiology, and pathology of major infectious and noninfectious diseases of free-living and confined fishes. Prereq: Fish 420 and VS 512A.

Fish **517 Fish Behavior** (2 cr). Response of fishes to environmental stimuli. One lec and one scheduled and three unscheduled hrs of lab a wk. Prereq: ecology and biometrics.

Fish **518 Fish Parasitology** (4 cr). Parasitology of freshwater fishes; ecology and life history of freshwater fish parasites; histopathology of parasitic diseases; current management problems associated with parasitic diseases.

Fish **WS519 Fish Genetics** (2 cr). WSU GenCB 516.

Fish **589 Water Resources Seminar** (1 cr). See Inter 589.

Fish **595** (s) **Problems in World Resources** (1-3 cr, max 3).

Fish **597** (s) **Practicum** (cr arr). Prereq: perm.

Fish **598** (s) **Internship** (cr arr). Prereq: perm.

Fish **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Fish **600 Doctoral Research and Dissertation** (cr arr). Prereq: admission to the doctoral program in "forestry, wildlife and range sciences" and perm of dept.

WILDLIFE RESOURCES

PREREQUISITE: Courses in this subject field numbered above 299 are not open to any undergraduate student who is on academic probation.

WLF **102 The Wildlife Profession** (1 cr). Survey of management problems and professional opportunities. Graded P/F.

WLF **200** (s) **Seminar** (cr arr). Prereq: perm.

WLF **203** (s) **Workshop** (cr arr). Prereq: perm.

WLF **204** (s) **Special Topics** (cr arr).

WLF **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

WLF **299** (s) **Directed Study** (cr arr). Prereq: perm.

WLF **314 Wildlife Ecology** (4 cr). Application of principles of ecology to conservation and management of wildlife in natural and altered habitats. Three lec and one lab a wk. Prereq: general ecology or perm.

WLF **390 Principles of Fish and Wildlife Ecology** (3 cr). See Fish 390.

WLF **397-398 Renewable Natural Resources Internship I-II** (cr arr). Supervised field experience with an appropriate public or private agency. Reqd for cooperative education students. Graded P/F. Prereq: perm of dept.

WLF **400** (s) **Seminar** (cr arr). Prereq: perm.

WLF **401 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

WLF **403** (s) **Workshop** (cr arr). Prereq: perm.

WLF **404** (s) **Special Topics** (cr arr).

WLF **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

WLF **441 Wildlife Behavioral Ecology and Management** (2 cr). Principles, methodology, and concepts of wildlife behavior and social organization applied to the study and management of wildlife populations. One 2-day field trip. Prereq: WLF 314, Zool 478, or perm.

WLF **442 Wildlife Management** (4 cr). Review of social and biological context for current practice of wildlife management. Three lec and one lab a wk. Prereq: WLF 314, 448, Zool 482, 483 or perm.

WLF **WS444 Disease Concepts for Wildlife Biologists** (3 cr). WSU V Mic 435.

WLF **445 Nongame Management** (2 cr). Disc; relation to current land-use practices. Prereq: Zool 482, 483, or perm.

WLF **446 Diseases of Wild Birds and Mammals** (2 cr). Alt/yrs. Same as VS 446A and Fish 446. Epidemiology, pathology, treatment, and control. Prereq: perm.

WLF **448 Fish and Wildlife Population Ecology** (4 cr). Attributes, natality, mortality, growth forms, fluctuations, and regulation of fish and wildlife populations. Three lec and one lab a wk. Prereq: Stat 251, course in vertebrate ecology.

WLF **WS465 Law of Evidence and Criminal Procedure** (3 cr). WSU Crm J 420.

WLF **489 Personalities and Philosophies in Conservation** (2 cr). See ResRc 489.

WLF **493 Environmental Law** (2 cr). Laws governing resource administration and environmental impacts. Prereq: sr standing.

WLF **495 Wildlife Seminar** (1-2 cr). Disc integrating biological, social, political, economic, and philosophic aspects of wildlife problems.

WLF **499** (s) **Directed Study** (cr arr). For the individual student; conferences, library, field, or lab work. Prereq: sr standing, GPA 2.5, and perm.

WLF **500 Master's Research and Thesis** (cr arr).

WLF **501** (s) **Seminar** (cr arr). Major philosophy, management, and research problems of wildlands; presentation of individual studies on assigned topics. Prereq: perm.

WLF **502** (s) **Directed Study** (cr arr). Prereq: perm.

WLF **503** (s) **Workshop** (cr arr). Selected topics in the conservation and management of natural resources. Prereq: perm.

WLF **504** (s) **Special Topics** (cr arr).

WLF **541 Advanced Population Biology** (2 cr). Alt/yrs. Readings and disc of current theories of population control, their biological basis, and applications to wildlife populations. Prereq: WLF 448 or perm.

WLF **542 Waterfowl Management** (3 cr). Alt/yrs. Ecology and management of species using wetland habitats. Lec-disc periods, field labs; three days of field trips. Prereq: ecology, population dynamics, and aquatic plants.

WLF **543 Fish and Wildlife Population Analysis** (3 cr). Quantitative analysis of fish and wildlife habitat, diet, harvest, population density, survival, and natality data; development and application of population models in fish and wildlife management. Two lec and 3 hrs of lab a wk. Prereq: WLF 448 or Fish 419, Stat 401 and CS 112 or perm.

WLF **544 Big Game Management** (3 cr). Readings and disc on large mammal management and ecology. One 3-hr lec a wk; two days of field trips. Prereq: WLF 442 or perm.

WLF **545 Game Range Ecology** (2 cr). Alt/yrs. Reading and disc on synecological relationships of wildlife habitats. Two days of field trips. Prereq: WLF 442 or perm, animal and plant ecology.

WLF **ID546 Upland Game Ecology** (2 cr). Alt/yrs. WSU NATRS 546. Ecology and management of forest and rangeland wildlife species. Three days of field trips. Prereq: perm.

WLF **WS548 Evolutionary Ecology of Populations** (3 cr). WSU Zool 548.

WLF **WS560 Environmental Physiology** (4 cr). WSU Zool 560.

WLF **WS588 Advanced Topics in Wildlife** (1-3 cr, max 10). WSU NATRS 588.

WLF **595** (s) **Problems in World Resources** (1-3 cr, max 3).

WLF **597** (s) **Practicum** (cr arr). Prereq: perm.

WLF **598** (s) **Internship** (cr arr). Prereq: perm.

WLF **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

WLF **600 Doctoral Research and Dissertation** (cr arr). Prereq: admission to the doctoral program in "forestry, wildlife and range sciences" and perm of dept.

Curricular Requirements

FISHERY RESOURCES (B.S.Fish.Res.)

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
Fish 102 Fishery Resources Profession	1
Fish 411 Ichthyology	4
Fish 413 Fish Ecology	3
Fish 415 Limnology	5
Fish 417 Aquaculture	3
Fish 418 Fisheries Management Techniques	2
Fish 419 Principles of Fisheries Management	3
Fish 420 Fish Diseases	3
Fish 495 Seminar	1
Bact 250 General Microbiology	4
Biochem 380 Introductory Biochemistry	3
Biol 201 Introduction to the Life Sciences	4
Biol 202 General Zoology	4
Biol 331 General Ecology	3
Chem 103 Introduction to Chemistry	4
Chem 275 Carbon Compounds	3
CommG 131 Fundamentals of Public Speaking	2
CS 102 Programming & Problem Solving for Scientists	3

Eng 317 Technical & Engineering Report Writing	3
FWR 101 Forestry Orientation	1
Phys 101 Fundamentals of Physics	4
Stat 251 Principles of Statistics	3
Zool 423 Comparative Vertebrate Physiology	4
Electives to total 136 credits for the degree	—

And one of the following options (including an employment requirement for the management option):

AQUACULTURE OPTION

Course	Credits
Fish 397 Renewable Natural Resources Internship	6
Acctg 201 Principles of Accounting	3
AgEc 391 Agribusiness Management	3
AnSc 305 Animal Nutrition	3
Bus 321 Marketing	3
Econ 151, 152 Principles of Economics	6
Math 160 Survey of Calculus or 180 Analytic Geometry & Calculus I	4
Social science/humanities electives	9

MANAGEMENT OPTION

Course	Credits
Biol 203 General Botany	4
Econ 272 Foundations of Economic Analysis	4
Ent 472, 474 Aquatic Entomology & Lab	3
For 462 Watershed Management or Range 351 Elements of Range Management or For 370 Principles of Forest Management	2-3
For 494 Models for Resource Decisions	4
Geol 101, 102 Physical Geology & Lab or Soils 205, 206 General Soils & Lab	4
Math 160 Survey of Calculus	4
WLF 448 Fish & Wildlife Population Ecology	4
Social science/humanities electives	12-13

WILDLIFE RESOURCES (B.S.Wildl.Res.)

Required course work includes the university requirements (see regulation J-3) and:

First and Second Years	Credits
Biol 201 Introduction to the Life Sciences	4
Biol 202 General Zoology	4
Biol 203 General Botany	4
Bot 241 Systematic Botany	3
Chem 103 Introduction to Chemistry	4
Chem 275 Carbon Compounds	3
CommG 131 Fundamentals of Public Speaking	2
CS 102 Programming & Problem Solving for Scientists	3
Econ 151, 152 Prin of Econ or 272 Foundations of Econ Analysis	4-6
FWR 101 Forestry Orientation	1
Geol 101, 102 Physical Geol & Lab or Soils 205-206 General Soils & Lab	4
Math 180 Analytic Geometry & Calculus I or 160 Survey of Calculus	4
Phys 113-114 General Physics	6
Range 221 Forest Ecology or Biol 331 General Ecology	3
Electives	9
Third and Fourth Years	
WLF 314 Wildlife Ecology	4
WLF 442 Wildlife Management	4
WLF 448 Fish & Wildlife Population Ecology	4
WLF 495 Wildlife Seminar	1
Biol 351 General Genetics	3
Eng 317 Technical & Engineering Report Writing	3
Fish 413 Fish Ecology	3
For 370 Principles of Forest Management	2
For 383 Econ for Natural Resource Mgrs or 470 Intro to Forest Land Resources Planning or 484 Forest Policy & Admin	2-3
Range 351 Elements of Range Management	3
ResRc 488 Interpretive Methods Lab or Comm 431 Professional Presentation Tech or Eng 205 Adv Expository Writing	3
Stat 251 Principles of Statistics	3
VS 371 Anatomy & Physiology or Zool 416 Mammalian Physiology or Zool 324 Comparative Vertebrate Anatomy	4
WLF/ResRc 400 Seminar in Public Relations Probs in Nat Res Mgt	2
Zool 482 Natural History of Birds	3
Zool 483 Natural History of Mammals	3
Approved electives from one of the following areas: quantitative; habitat; aquatic; communications; policy-administration; biology	12
Electives	22

Department of Food Science and Toxicology

Jerry H. Exon, Dept. Head (22 Glen C. Holm Bldg.). Faculty: Jorg A. L. Augustin, A. Larry Branen, Jerry H. Exon, Gary G. Mather, John E. Montoure, Paul Muneta, Elizabeth South, Patricia A. Talcott. Adjunct Faculty: Kim Anderson, Gregory Moller.

Food science is a study in the science and technology related to the safety, quality, procurement, processing, preservation, and distribution of foods and food products.

Toxicology is the scientific study related to poisonous substances, their biologic effects, physical properties, and antidotes, and the recognition and treatment of diseases caused by such substances. These substances may be naturally occurring or manufactured.

The Department of Food Science and Toxicology offers the B.S. degree in food science in conjunction with Oregon State University and Washington State University. Through a combination of specific program requirements, course offerings, and student advising, the Department of Food Science and Toxicology prepares students to attain their personal and career goals. The professions of food science and toxicology deal with the relationship of the basic sciences to the well being of all people. Major emphases are food product safety and quality and the quality of the environment.

Food Science Courses

FS **101 Food and Life** (3 cr). World food problems; concepts of nutritional adequacy; processing, microbiology, preservation, and packaging of foods; additives and regulations.

FS **WS301 Dairy Products** (3 cr). WSU FSHN 301.

FS **WS303 Fruit and Vegetable Products** (3 cr). WSU FSHN 303.

FS **WS-J422/WS-J522 Food Quality Evaluation** (3 cr). WSU FSHN 522. Alt/yrs.

FS **WS-J450/WS-J550 Food Fermentations** (3 cr). WSU FSHN 450/550. Alt/yrs.

FS **WS460 Food Chemistry** (3 cr). WSU FSHN 460.

FS **WS461 Food Chemistry Lab** (1 cr). WSU FSHN 461.

FS **WS510 Advanced Food Chemistry** (3 cr). WSU FSHN 510.

FS **WS522 Food Quality Evaluation** (3 cr). See FS J422/J522.

FS **WS550 Food Fermentations** (3 cr). See FS J450/J550.

Curricular Requirements

FOOD SCIENCE

Emphasis in this program is placed on providing a sound background to prepare students for positions in the food producing and processing industry, governmental agencies, and research laboratories, and to prepare students who wish to pursue an advanced degree in food science. Programs are offered in cooperation with Oregon State University and Washington State University, the degree-granting institutions. Under the OSU program, the Idaho student spends the first two years at UI and the second two years in the OSU Department of Food Science and Technology. Idaho resident students are not charged out-of-state tuition by OSU. Students pursuing the WSU option spend three years in the UI Department of Food Science and Toxicology and the fourth year in the WSU Department of Food Science and Human Nutrition. Courses are available at UI and WSU during the entire four-year program.

Required course work for the cooperative program with WSU includes WSU requirements for graduation, advanced food science courses, and:

Course	Credits
AgEc 278 Principles of Farm & Ranch Management	4
AgEc 289 Agricultural Markets & Prices	3
AgMech 405 Agricultural Processing	3
AnSc 263 Introduction to Meat Science	3
AnSc 305 Animal Nutrition	3
Bact 250 General Microbiology	4
Bact 402 Food & Applied Microbiology	4
Biochem 380 Introductory Biochemistry	3
Biol 201 Introduction to the Life Sciences	4
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
Chem 253 Quantitative Analysis	5
Chem 277, 278 Organic Chemistry I & Lab	4
CommG 131 Fundamentals of Public Speaking	2
Econ 152 Principles of Economics	3
Eng 317 Technical & Engineering Report Writing	3
FS 101 Food & Life	3
Math 111 Finite Mathematics	4
Math 160 Survey of Calculus	4
Phys 113-114-115-116 General Physics & Lab	8
Stat 301 Probability & Statistics	3

The following required courses taught at Washington State University may be taken while enrolled at UI:

FS 301 Dairy Products	3
FS 303 Fruit & Vegetable Products	3
FS 422 Food Quality Evaluation	3
FS 450 Food Fermentations	3
FS 460, 461 Food Chemistry & Lab	4

Department of Foreign Languages and Literatures

Michael W. Moody, Dept. Chair (314 Admin. Bldg.). Faculty: George Bridges (German), Alfred W. Jensen (Spanish), Richard M. Keenan (Spanish), Shirley Koenen (French), Elisabeth Lapeyre (French), Cecelia E. Luschnig (Classics), Michael W. Moody (Spanish), Louis A. Perraud (Classics), James R. Reece (German), Alan Rose (French), Galen O. Rowe (Classics), Gerd Steckel (German), Robert L. Surles (Spanish), Dennis D. West (Spanish), Joan M. West (French).

The study of a foreign language and literature is a way of expanding one's horizons while developing specific linguistic skills that will enhance career, academic, and travel opportunities. One of the many benefits derived from foreign-language study is the ability to transcend linguistic and cultural parochialism. To understand the uniqueness of one's own language and civilization, knowledge of another culture is essential. Language study is the key that unlocks the mysteries surrounding a foreign people. Through language, one is able to explore their literature, art, history, and philosophy—in short, their way of life. In preparing to meet the challenges of a rapidly changing and interdependent world, foreign language expertise plays an increasingly important role. In many areas (business, education, communications, social work, technical and engineering positions, science, law, medicine, etc.), knowledge of a second language is not only desirable but necessary.

The Department of Foreign Languages and Literatures offers major programs of study in modern languages (French, German, Spanish) and classical studies (Greek, Latin). New programs offer students an opportunity to combine training in a foreign language with business and computer science.

A modern language laboratory enables students to develop speaking and listening skills in specially prepared autotutorial courses. In addition to the standard audiocassette record/playback units, the laboratory includes a high-speed copying service that allows students to have their own audiocassettes for home study. There are also special facilities for synchronized slide/sound and videocassette instruction. A capability for computer-assisted instruction is now being developed.

All members of the permanent faculty hold Ph.D. degrees, and most of them have lived and traveled extensively in the foreign countries of their expertise. Foreign language classes are small enough to ensure that each student receives individual attention. The department's faculty members have established an excellent record for teaching.

Information about opportunities for work and study in foreign countries is kept up-to-date in the department's seminar room, and faculty advisers gladly assist students in planning a semester's or a year's study abroad. You may already have studied one or more foreign languages in high school; if you have and you are an undergraduate, you are eligible to receive advanced-placement credits simply by completing a higher level course at UI and requesting the credits through the Department of Foreign Languages and Literatures.

The department offers graduate work in French, German, and Spanish leading to the M.A.T. degree. The purpose of graduate programs in languages, cultures, and literatures is to offer advanced scholarly preparation for careers in teaching.

For further information, please consult the department chair (208/885-6179).

Courses

ADVANCED PLACEMENT: Courses in this subject field that are vertical in content are: FL/FR 101-102-201-202; FL/GN 121-122-221-222; FL/GK 341-342-441-442; FL/LA 161-162; FL/SP 181-182-281-282. In appropriate cases, with the approval of the chair of the Department of Foreign Languages and Literatures, any one of the following courses may be considered the terminal course in the vertical sequence for advanced placement: FL/FR 301-302; FL/GN 321-322; FL/SP 381-382. Any upper-division Latin literature course may be used to receive advanced placement credit for FL/LA 161-162.

PREREQUISITE: Prerequisite for upper-division language courses, except those in Greek, is the appropriate intermediate course or equivalent.

COURSES OFFERED IN ENGLISH

No knowledge of foreign language required. May be used to fulfill the L & S humanities requirement.

FL/EN **200** (s) **Seminar** (cr arr). Prereq: perm.

FL/EN **204** (s) **Special Topics** (cr arr).

FL/EN **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

FL/EN **209 Learning Lab** (1 cr, max arr). Autotutorial instruction using audiovisual materials. Graded P/F. Prereq: perm.

FL/EN **211-212 Classical Mythology** (2 cr). Intro to classical myths and legends and their survival in western literature and art.

FL/EN **243 English Word Origins** (2 cr). Fundamental Latin and Greek words used in the humanities and natural science; emphasis on terminology of fields in which students are interested; knowledge of Greek or Latin is not required.

FL/EN **299** (s) **Directed Study** (cr arr). Prereq: perm.

FL/EN **313-314 Modern French Literature in Translation** (3 cr). A maximum of 3 cr of FL/EN 313-314 may be counted toward a major in French. Major modern French authors in English translation; knowledge of French is not required.

FL/EN **323-324 German Literature in Translation** (3 cr). A maximum of 3 cr in FL/EN 323-324 may be counted toward a major in German. Major German-language authors in English translation; knowledge of German is not required.

FL/EN **ID363-ID364 Literature of Ancient Greece and Rome** (3 cr). WSU Clas 363/364. FL/EN 363: Greece. FL/EN 364: Rome. Ancient culture primarily through writings of Greek and Roman poets, playwrights, thinkers, and historians in English translation; may take the form of a survey or center on a theme or genre; lec, disc, and writing.

FL/EN **391 Hispanic Film** (3 cr). Open to all students. Genre, structure, and style of representative fiction and nonfiction films of Spain and Latin America. May not be taken concurrently with FL/SP 391.

FL/EN **393 Spanish Literature in Translation** (3 cr). A maximum of 3 cr in FL/EN 393 and 394 may be counted toward a major in Spanish. Major Spanish-language authors in English translation; knowledge of Spanish is not required.

FL/EN **394 Latin American Literature in Translation** (3 cr). A maximum of 3 cr in FL/EN 393 and 394 may be counted toward a major in Spanish. Major Spanish-language authors in English translation; knowledge of Spanish is not required.

FL/EN **400** (s) **Seminar** (cr arr). Prereq: perm.

FL/EN **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

FL/EN **441 Ancient Greek Civilization** (3 cr) (Hist J441/J541). Survey of development of Greek civilization, BC 2000-BC 300.

FL/EN **442 Civilization of Ancient Rome** (3 cr) (Hist J442/J542). Survey of development of Roman civilization, BC 800-AD 500.

FL/EN **449 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm of dept.

FL/EN **498** (s) **Proseminar** (1-3 cr, max 12). May be graded P/F when grading system is uniform for all students in the class. Prereq: perm.

FL/EN **499** (s) **Directed Study** (cr arr). Prereq: perm.

CHINESE

FL/CH **WS101 Chinese First Semester** (4 cr). WSU Chin 101. Open only to students with a declared major or minor in international studies.

FL/CH **WS102 Chinese Second Semester** (4 cr). WSU Chin 102. Open only to students with a declared major or minor in international studies.

FL/CH **WS203 Chinese Third Semester** (4 cr). WSU Chin 203. Open only to students with a declared major or minor in international studies.

FRENCH

FL/FR **101-102 Elementary French** (4 cr) (C, 101 only). FL/FR 101 satisfies core requirement J-3-a. Pronunciation, vocab, reading, spoken French, and functional grammar.

FL/FR **103** (s) **French Language Lab** (1 cr, max 4). Practice in listening comprehension, pronunciation, and grammatical structures. Graded P/F. Coreq: elementary or intermediate French (FL/FR 101-102, 201-202).

FL/FR **200** (s) **Seminar** (cr arr). Prereq: perm.

FL/FR **201-202 Intermediate French** (4 cr). Reading, grammar review, speaking, and writing. Prereq: FL/FR 102.

FL/FR **204** (s) **Special Topics** (cr arr).

FL/FR **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

FL/FR **299** (s) **Directed Study** (cr arr). Prereq: perm.

FL/FR **301 Advanced French Grammar** (3 cr).

FL/FR **302 Advanced French Writing Skills** (3 cr). Recommended for students who wish to continue in upper-division French courses.

FL/FR **303 French Civilization: Institutions** (3 cr).

FL/FR **304 French Culture** (3 cr).

FL/FR **305 Survey of French Fiction and Drama** (3 cr). Middle Ages to the present.

FL/FR **306 Survey of French Essay and Poetry** (3 cr). Middle Ages to the present.

FL/FR **309 French Language Lab** (1 cr, max arr). Advanced conversational skills. Graded P/F. Prereq: perm.

FL/FR **400** (s) **Seminar** (cr arr). Prereq: perm.

FL/FR **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

FL/FR **407** (s) **French Literary Themes** (3 cr).

FL/FR **409 French Phonetics** (1-3 cr, max 6). Phonetic description and phonemic analysis; stress, its nature and place; intonation patterns in conversation; reading of prose and poetry.

FL/FR **411 French Conversation** (3 cr).

FL/FR **415** (s) **Special Topics** (cr arr).

FL/FR **416 French Business** (3 cr).

FL/FR **449 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm of dept.

FL/FR **498** (s) **Proseminar** (1-3 cr, max 12). May be graded P/F when grading system is uniform for all students in the class. Prereq: perm.

FL/FR **499** (s) **Directed Study** (cr arr). Prereq: perm.

FL/FR **501** (s) **Seminar** (cr arr). Prereq: perm.

FL/FR **502** (s) **Directed Study** (cr arr). Prereq: perm.

FL/FR **504** (s) **Special Topics** (cr arr).

GERMAN

FL/GN **121-122 Elementary German** (4 cr). FL/GN 121 satisfies core requirement J-3-a. Pronunciation, vocabulary, reading, spoken German, and functional grammar.

FL/GN **123** (s) **German Language Lab** (1 cr, max 4). Practice in listening comprehension and conversational skills. Graded P/F. Coreq: elementary or intermediate German (FL/GN 121-122, 221-222).

FL/GN **200** (s) **Seminar** (cr arr). Prereq: perm.

FL/GN **204** (s) **Special Topics** (cr arr).

FL/GN **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

FL/GN **221-222 Intermediate German** (4 cr). Review and practice of basic language skills; increased emphasis on reading and free discussion. Appropriate starting point for students with two or three yrs of high school German. Prereq: FL/GN 122 or equiv.

FL/GN **225 German for Reading Knowledge** (3 cr). Emphasis on descriptive grammar and rapid acquisition of reading fluency in German; preparation for grad reading exam. May not be counted toward fulfillment of language requirement for B.A. degree.

FL/GN **299** (s) **Directed Study** (cr arr). Prereq: perm.

FL/GN **321 German Conversation** (3 cr). Emphasis on developing proficiency in speaking and writing; discussion on topics of cultural interest. Prereq: FL/GN 222.

FL/GN **322 German Grammar and Composition** (3 cr). Emphasis on writing skills and various kinds of writing; selective review of German grammar and usage. Prereq: FL/GN 222.

FL/GN **325-326 German Culture and Institutions** (3 cr). May be taken in either order; survey of German cultural heritage from the earliest times to the present. FL/GN 325: development in the arts, philosophy, science, political and social thought through end of 19th century; history and political development of German nation. FL/GN 326: German society and political culture in 20th century; contemporary social and political institutions. Prereq or coreq: FL/GN 222.

FL/GN **327-328 Survey of German Literature** (3 cr). May be taken in either order; intro course in study of German literature. FL/GN 327: chronological survey of literature from earliest times to beginning of 19th century. FL/GN 328: representative works of modern literature from 19th and 20th centuries. Prereq: FL/GN 222.

FL/GN **329** (s) **German Language Lab** (1 cr, max 2). Advanced aural comprehension; everyday conversational situations, radio and TV programming. Graded P/F. Prereq: perm.

FL/GN **400** (s) **Seminar** (cr arr). Prereq: perm.

FL/GN **404** (s) **Special Topics** (cr arr).

FL/GN **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

FL/GN **420** (s) **Readings in German Literature** (3 cr). For advanced students; focus on literary period, theme, genre, or work of a single author. Prereq: FL/GN 327 or 328, or perm.

FL/GN **430 German Phonetics** (2 cr). Phonetic description and phonemic analysis; stress, its nature and place; intonation patterns in conversation; reading of prose and poetry.

FL/GN **431-432 Topics in German Language and Culture** (3 cr). Cultural, political, and linguistic topics of contemporary interest.

FL/GN **449 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm of dept.

FL/GN **498** (s) **Proseminar** (1-3 cr, max 12). May be graded P/F when grading system is uniform for all students in the class. Prereq: perm.

FL/GN **499** (s) **Directed Study** (cr arr). Prereq: perm.

FL/GN **501** (s) **Seminar** (cr arr). Prereq: perm.

FL/GN **502** (s) **Directed Study** (cr arr). Prereq: perm.

FL/GN **504** (s) **Special Topics** (cr arr).

ANCIENT GREEK

FL/GK **200** (s) **Seminar** (cr arr). Prereq: perm.

FL/GK **204** (s) **Special Topics** (cr arr).

FL/GK **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

FL/GK **299** (s) **Directed Study** (cr arr). Prereq: perm.

FL/GK **ID341-ID342 Elementary Greek** (4 cr). WSU Clas 341-342. FL/GK 341 satisfies core requirement J-3-a. Pronunciation, vocab, reading, and functional grammar.

FL/GK **ID349** (s) **Greek Language Lab** (1 cr, max arr). WSU Clas 349. A maximum of two credits may be earned in basic skills. Graded P/F. Prereq: perm.

FL/GK **400** (s) **Seminar** (cr arr). Prereq: perm.

FL/GK **404** (s) **Special Topics** (cr arr).

FL/GK **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

FL/GK **ID441-ID442** (s) **Intermediate Greek** (4 cr, max arr). WSU Clas 441-442. Readings in classical Greek prose and poetry.

FL/GK **449 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm of dept.

FL/GK **498** (s) **Proseminar** (1-3 cr, max 12). May be graded P/F when grading system is uniform for all students in the class. Prereq: perm.

FL/GK **499** (s) **Directed Study** (cr arr). Prereq: perm.

JAPANESE

FL/JP **WS101 Japanese I** (4 cr). WSU Japn 101. Open only to students with a declared major or minor in international studies.

FL/JP **WS102 Japanese II** (4 cr). WSU Japn 102. Open only to students with a declared major or minor in international studies.

FL/JP **WS203 Japanese III** (4 cr). WSU Japn 203. Open only to students with a declared major or minor in international studies.

LATIN

FL/LA **161-162 Elementary Latin** (4 cr). FL/LA 161 satisfies core requirement J-3-a. Pronunciation, vocabulary, reading, composition, and functional grammar.

FL/LA **163 Latin Language Lab** (1 cr, max arr). Elementary- and intermediate-level skills. Graded P/F. Prereq: perm.

FL/LA **200** (s) **Seminar** (cr arr). Prereq: perm.

FL/LA **204** (s) **Special Topics** (cr arr).

FL/LA **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

FL/LA **261-262 Intensive Latin** (4 cr). Grammar, reading, composition. Prereq: perm.

FL/LA **299** (s) **Directed Study** (cr arr). Prereq: perm.

FL/LA **ID365-ID366 Survey of Latin Literature** (3 cr). WSU Clas 365-366. From early Latin to the Middle Ages.

FL/LA **ID369** (s) **Latin Language Lab** (1 cr, max arr). WSU Clas 369. Advanced-level expressive skills. Graded P/F. Prereq: perm.

FL/LA **400** (s) **Seminar** (cr arr). Prereq: perm.

FL/LA **404** (s) **Special Topics** (cr arr).

FL/LA **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

FL/LA **449 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm of dept.

FL/LA **ID461-ID462 Latin Literature of the Augustan Age** (3 cr). WSU Clas 461-462.

FL/LA **ID463-ID464 Latin Literature of the Republic** (3 cr). WSU Clas 463-464.

FL/LA **ID465-ID466 Latin Literature of the Silver Age** (3 cr). WSU Clas 465-466.

FL/LA **498** (s) **Proseminar** (1-3 cr, max 12). May be graded P/F when grading system is uniform for all students in the class. Prereq: perm.

FL/LA **499** (s) **Directed Study** (cr arr). Prereq: perm.

RUSSIAN

FL/RU **WS101 First Semester Russian** (4 cr). WSU Rus 101.

FL/RU **WS102 Second Semester Russian** (4 cr). WSU Rus 102.

FL/RU **WS203 Third Semester Russian** (4 cr). WSU Rus 203.

FL/RU **WS304 Intermediate Russian** (4 cr). WSU Rus 304.

FL/RU **WS305 Russian Conversation** (1 cr). WSU Rus 305.

SPANISH

FL/SP **181-182 Elementary Spanish** (4 cr). FL/SP 181 satisfies core requirement J-3-a. Pronunciation, vocabulary, reading, spoken Spanish, and functional grammar.

FL/SP **183** (s) **Spanish Language Lab** (1 cr, max 4). Practice in listening comprehension and conversational skills. Graded P/F. Coreq: elementary or intermediate Spanish (FL/SP 181-182 or 281-282).

FL/SP **200** (s) **Seminar** (cr arr). Prereq: perm.

FL/SP **204** (s) **Special Topics** (cr arr).

FL/SP **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

FL/SP **281-282 Intermediate Spanish** (4 cr). Reading, grammar review, speaking, and writing. Prereq: FL/SP 182.

FL/SP **299** (s) **Directed Study** (cr arr). Prereq: perm.

FL/SP **381-382 Advanced Spanish Grammar and Composition** (3 cr). Recommended for prospective teachers of Spanish.

FL/SP **383-384 Hispanic Culture and Institutions** (3 cr). Topics in Spanish and Latin American civilizations. Prereq: FL/SP 381 or 382, or perm.

FL/SP **385-386 Survey of Spanish Literature** (3 cr). Prereq: FL/SP 381 or 382, or perm.

FL/SP **387-388 Survey of Spanish-American Literature** (3 cr). Prereq: FL/SP 381 or 382, or perm.

FL/SP **389 Spanish Language Lab** (1 cr, max arr). Advanced conversational skills. Graded P/F. Prereq: perm.

FL/SP **391 Hispanic Film** (3 cr). Genre, structure, and style of representative fiction and nonfiction films of Spain and Latin America. May be taken concurrently with FL/SP 282 with perm of instructor; may not be taken concurrently with FL/EN 391.

FL/SP **400** (s) **Seminar** (cr arr). Prereq: FL/SP 381 or 382, or perm.

FL/SP **404** (s) **Special Topics** (cr arr). Prereq: FL/SP 381 or 382, or perm.

FL/SP **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

FL/SP **449 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm of dept.

FL/SP **485-486 Contemporary Spanish Literature** (3 cr). Prereq: FL/SP 381 or 382, or perm.

FL/SP **487-488 Contemporary Spanish-American Literature** (3 cr). Prereq: FL/SP 381 or 382, or perm.

FL/SP **493 Spanish for Teachers** (2 cr). Language and culture; pronunciation and diction.

FL/SP **498** (s) **Proseminar** (1-3 cr, max 12). May be graded P/F when grading system is uniform for all students in the class. Prereq: perm.

FL/SP **499** (s) **Directed Study** (cr arr). Prereq: perm.

FL/SP **501** (s) **Seminar** (cr arr). Prereq: perm.

FL/SP **502** (s) **Directed Study** (cr arr). Prereq: perm.

FL/SP **504** (s) **Special Topics** (cr arr).

GENERAL COURSES

FL **200** (s) **Seminar** (cr arr). Prereq: perm.

FL **204** (s) **Special Topics** (cr arr). Prereq: perm.

FL **299** (s) **Directed Study** (cr arr). Prereq: perm.

FL **400** (s) **Seminar** (cr arr). Prereq: perm.

FL **404** (s) **Special Topics** (cr arr). Prereq: perm.

FL **499** (s) **Directed Study** (cr arr). Prereq: perm.

Curricular Requirements

A maximum of 15 transfer credits and/or credits earned through study abroad may be applied toward the upper-division requirements for the B.A. degree in French, German, Latin, Spanish, and classical studies.

CLASSICAL STUDIES (B.A.)

Required course work includes the university requirements (see regulation J-3), the general requirements for the B.A. degree, and:

Course	Credits
FL/EN 211-212 Classical Mythology	4
FL/EN 363-364 Literature of Ancient Greece & Rome	6
FL/GK 341-342 Elementary Greek (or equivalent)	8
FL/LA 161-162 Elem Latin or 261-262 Intensive Latin (or equiv)	8
Additional Latin and/or Greek courses numbered above FL/LA 262 and FL/GK 342 (may incl up to 3 cr of adv lab courses in each language—FL/LA 369; FL/GK 349 other than basic skills)	18
At least eight credits chosen from the following	8
Additional upper-div Latin and Greek courses (recommended for those seeking admission to graduate school)	
FL/EN 243 English Word Origins	
FL/EN 441 Ancient Greek Civilization	
FL/EN 442 Civilization of Ancient Rome	
Anthr 230 World Prehistory	
Arch 385 History of Architecture	
Eng 441 Introduction to the Study of Language	
Phil 309 History of Ancient Philosophy	
Related fields or minor as approved by major adviser	

FRENCH (B.A.)

Required course work includes the university requirements (see regulation J-3), the general requirements for the B.A. degree, and:

Course	Credits
FL/FR 101-102 Elementary French or equivalent	8
FL/FR 201-202 Intermediate French or equivalent	8
FL/FR 301 Advanced French Grammar	3
Courses selected from the following	9
FL/FR 302 Advanced French Writing Skills	
FL/FR 303 French Civilization: Institutions	
FL/FR 304 French Culture	
FL/FR 305 Survey of French Fiction & Drama	
FL/FR 306 Survey of French Essay & Poetry	
Upper-division French courses	9
A second foreign language (elem & interm or equiv)	16
Courses in related fields approved by chair or approved academic minor in a related field	20

GERMAN (B.A.)

Required course work includes the university requirements (see regulation J-3), the general requirements for the B.A. degree, and:

Course	Credits
FL/GN 121-122 Elementary German or equivalent	8
FL/GN 221-222 Intermediate German or equivalent	8
Upper-division courses in German language, lit, and culture incl minimum of 12 cr from the following (at least one course from each grouping) and a minimum of 3 cr in 400-level German language & lit	21
FL/GN 321 German Conversation & FL/GN 322 German Grammar & Composition	
FL/GN 325-326 German Culture & Institutions	
FL/GN 327-328 Survey of German Literature	
A second foreign language (elem & interm or equiv)	16
Courses in related fields approved by chair or approved academic minor in a related area	20

LATIN (B.A.)

Required course work includes the university requirements (see regulation J-3), the general requirements for the B.A. degree, and:

Course	Credits
FL/LA 161-162 Elementary Latin (or equivalent)	8
FL/EN 243 English Word Origins	2
FL/EN 364 Literature of Rome	3
FL/EN 442 Civilization of Ancient Rome	3
Upper-division courses in Latin	20
A second foreign language (elem and interm, or equivalent)	16
Related fields or academic minor (as approved by chair)	20

SPANISH (B.A.)

Required course work includes the university requirements (see regulation J-3), the general requirements for the B.A. degree, and:

Course	Credits
FL/SP 181-182 Elementary Spanish (or equivalent)	8
FL/SP 281-282 Intermediate Spanish (or equivalent)	8
FL/SP 381-382 Advanced Spanish Grammar & Composition	6
FL/SP 383-384 Hispanic Culture & Institutions	6
FL/SP 385-386 Survey of Spanish Literature	6
FL/SP 388 Survey of Spanish-American Literature	3
Upper-division courses in Spanish language	3
A second foreign language (elem and interm, or equivalent)	16
Related fields (as approved by chair)	16

FOREIGN LANGUAGES (B.A.)

Required course work includes the university requirements (see regulation J-3), the general requirements for the B.A. degree, and:

Course	Credits
One foreign language, elementary and intermediate	16
Third-year language course (FL/FR 301-302, FL/GN 321-322, FL/LA 365-366, FL/SP 381-382)	3
And one of the following options:	

A. BUSINESS OPTION

Designed to provide the student majoring in foreign languages with a liberal arts background and a component of business courses that will form a good beginning for entering a program leading to the degree of Master of Business Administration.

Course	Credits
Approved upper-division foreign language courses	15
Foreign language business course or approved alternative	3
Acctg 395 Fundamentals of Accounting or 201-202 Principles of Accounting & Managerial Accounting	4-6
Bus 301 Financial Management	3

Bus 311 Introduction to Management 3
Bus 321 Marketing 3
Bus 350 Management Information Systems 3
Bus 474 International Business or Bus 475 International Marketing or Econ 474 International Economics or Econ 477 Economics of Developing Countries 3
CS 112 Introduction to Problem Solving & Programming 3
Econ 272 Foundations of Econ Analysis or 151, 152 Prin of Economics 4-6
Stat 251 Principles of Statistics 3
Electives (as approved by chair) to total 128 cr for the degree ..... —

B. COMPUTER SCIENCE OPTION

Designed to provide a student majoring in foreign languages with a liberal arts background and a component of computer science courses to prepare for admission to either the M.A.T. program in foreign languages or the M.S. program in computer science. This type of curriculum, involving competence in a foreign language as well as mathematical maturity, skill in the use of at least one programming language, and a basic knowledge of computer hardware, should also prove to be a fine background for developing interesting careers and/or graduate study in various fields, e.g., library science, international business, communications media, instructional media, and education.

Course	Credits
Approved upper-division foreign language courses in one foreign language or the following	18
FL/EN 243 English Word Origins	
FL/GK 341-342 Elementary Greek	
FL/LA 161-162 Elementary Latin	
Upper-division Latin and/or Greek courses (18 cr)	
CS 112 Introduction to Problem Solving & Programing	3
CS 113 Program Design & Algorithms	3
CS 213 Data Structures	3
EE 340 Digital Logic	3
Math 176 Discrete Mathematics	4
Math 180, 190 Analytic Geometry & Calculus	8
Math 330 Linear Algebra	3
Stat 251 Principles of Statistics	3
Electives to total 128 cr for the degree (including at least 3 cr at the upper-division level)	—

Academic Minor Requirements

A maximum of 6 transfer credits and/or credits earned through study abroad may be applied toward the upper-division course requirements for a minor in French, German, Spanish, Latin, and Greek.

CLASSICAL STUDIES MINOR

Course	Credits
FL/EN 211-212 Classical Mythology	4
FL/EN 243 English Word Origins	2

And one of the following emphasis areas:

Language Emphasis

FL/GK 341-342 Elementary Greek	8
FL/LA 161-162 Elementary Latin	8
Courses chosen from the following	3
Upper-division Latin or Greek	
FL/EN 363 Literature of Ancient Greece	
FL/EN 364 Literature of Rome	

Ancient World Emphasis

FL/EN 363 Literature of Ancient Greece	3
FL/EN 364 Literature of Rome	3
FL/EN 441 Ancient Greek Civilization	3
FL/EN 442 Civilization of Ancient Rome	3
FL/GK 341 Elementary Greek or FL/LA 161 Elementary Latin	4
Phil 309 Hist of Ancient Philosophy or Arch 385 Hist of Architecture	3

FRENCH MINOR

Course	Credits
FL/FR 101-102 Elementary French	8
FL/FR 201-202 Intermediate French	8
FL/FR 301 Adv French Grammar or 302 Adv French Writing Skills	3
Upper-div courses in French (not incl lab-based and lit in translation courses)	6

GERMAN MINOR

Course	Credits
FL/GN 121-122 Elementary German	8
FL/GN 221-222 Intermediate German	8
FL/GN 321 German Conversation or 322 German Grammar & Composition	3
Upper-div courses in German (not incl lab-based and lit in translation courses)	6

GREEK MINOR

Course	Credits
FL/GK 341-342 Elementary Greek	8
FL/GK 349 Advanced Greek lab (other than basic skills)	1-3
FL/EN 211 and/or 212 Classical Mythology	2-4
FL/EN 363 Literature of Greece	3
Advanced Greek readings (400-level)	6-8
Courses to total 25 credits for the minor chosen from the following	—
Additional upper-division Greek courses	
FL/EN 243 English Word Origins	
FL/EN 364 Literature of Rome	
FL/EN 441 Ancient Greek Civilization	
Phil 309 Ancient Philosophy	

LATIN MINOR

Course	Credits
FL/LA 161-162 or 261-262 Elementary or Intensive Latin	8
FL/LA 369 Advanced Latin Lab	1-3
FL/EN 243 English Word Origins	2
FL/EN 364 Literature of Ancient Rome	3
Advanced Latin readings (300- or 400-level)	6
Courses to total 25 credits for the minor chosen from the following	—
Additional Latin reading courses at 300- or 400-level (especially recommended for prospective teachers of Latin)	
FL/EN 211-212 Classical Mythology	
FL/EN 363 Literature of Ancient Greece	
EN/FL 442 Civilization of Ancient Rome	

SPANISH MINOR

Course	Credits
FL/SP 181-182 Elementary Spanish	8
FL/SP 281-282 Intermediate Spanish	8
FL/SP 381 or 382 Adv Spanish Grammar & Composition	3
Upper-div courses in Spanish (not incl lab-based and lit in translation courses)	6

Department of Forest Products

Leonard R. Johnson, Dept. Head (102D FWR Bldg.). Faculty: Alton G. Campbell, Thomas M. Gorman, Robert L. Govett, Leonard R. Johnson, Harry W. Lee, Ali A. Moslemi, H. Peter Steinhagen. Adjunct Faculty: Louis L. Edwards, Robert P. Lottman, John S. Morris, Jay O'Laughlin, George M. Simmons. Affiliate Faculty: John G. Haygreen, Herbert J. Hatcher, Manuel R. Jelvez, Peter Koch, William F. Lehman, George E. Smith.

Wood is a constant part of the lives of the people in this country and throughout the world. Nearly 80 percent of the material going into the construction of a home is wood based. It is also in the paper we use as newspapers, money, books, packaging, and countless other products of basic human need. For example, over three-fourths of the food packages in the average supermarket are made with wood fiber. In the U.S., every man, woman, and child consumes over 2,000 pounds of wood per year in the form of various products. This level of wood use is projected to double by the year 2010. The forest products industries rely on a renewable resource—trees—to produce over 5,000 different products for shelter, communications, packaging, and chemicals. Wood not only provides the feedstock for product manufacture, it also supplies a large portion of the energy needed by these industries. Many wood-using industries generate more than 50 percent of their energy requirements from residues. The nation's pulp and paper segment of the industry is the largest cogenerator of electrical power, accounting for 40 percent of the cogenerated electricity produced in the U.S.

The forest products industries employ nearly 1.5 million people and annually ship products valued at nearly $125 billion. This makes these industries among the largest in the U.S. A great deal of innovation and modernization is now taking place to attain a higher degree of efficiency. At present, the U.S. forest products industries are believed to be among the world's low-cost producer of goods. There is an excellent opportunity to substantially increase exports thereby contributing to a greater level of employment opportunities in the U.S. and abroad for forest-products graduates.

The programs of the Forest Products Department are designed to prepare students for rewarding careers in an array of forest-products industries. Outstanding careers await graduates of the department in such areas as supervision of light-frame construction, logging engineering, log transport systems, pulp and paper manufacture, wood and fiber processing, business, and marketing aspects of the various industries. The department continually monitors the needs of the industries for which it provides skilled manpower. In addition to jobs in industry, UI graduates also obtain positions in a variety of governmental agencies and multinational

corporations. Some graduates are working on large industrial development projects in various parts of the world.

The Department of Forest Products, which is in the College of Forestry, Wildlife and Range Sciences, cooperates with Washington State University's wood technology program, the University of Minnesota, and the region's large forest products industries in carrying out its program responsibilities. The department offers an option in timber harvesting leading to the B.S.For.Prod. degree. In addition, options are offered in wood construction and design (in cooperation with the Department of Architecture) and in forest products business management and marketing. The latter two options also lead to the B.S.For.Prod. degree.

A cooperative program with the University of Minnesota allows the student to select a degree option in pulp and paper technology. Under this program, the student spends the first three years at UI. The senior year is spent at the University of Minnesota, but the degree is awarded by the University of Idaho. This program permits access to the professional courses at both universities.

Each of these four curricular options is designed to give the student a solid foundation so that graduates can function effectively in their fields and in society in general. A variety of facilities, such as a 2,000 psi computerized hot press, testing machine, wood flaker, blender, microwave generator, dry kiln, a unique biomonitoring lab and microcomputer lab, add special educational capabilities to the department.

The department offers both master's and doctoral programs. A graduate student's program is tailor-made to the student's career goals and aspirations. A variety of industrial organizations and public agencies provide the funds and facilities for carrying out research and this allows the department to offer assistantships and fellowships.

Graduate work is often undertaken by students who desire to enter careers in teaching and research. In addition, the program is also recommended for students who plan to enter production management and marketing. Work at the master's level is designed to enhance the student's professional background and is often pursued by those with backgrounds in forestry, business management, engineering, and other fields.

The department maintains an active research program involving many projects and graduate students. For some students who plan to strengthen their background and enter the industrial and production fields, a nonthesis option at the master's level is available. Current research involves topics on solid wood products, fiber and particle products, timber harvesting systems, wood energy, wood chemistry, and wood construction. The department cooperates with several institutions around the world, and international opportunities for faculty and student exchanges take place from time to time.

Forest Products Courses

PREREQUISITE: Courses in this subject field above 299 are not open to any undergraduate student who is on academic probation.

Note: Courses numbered ForPr 460-471 are taught at the University of Minnesota. UM is on the quarter system; however, credits are listed in this catalog in equivalent semester hours.

ForPr **177 Forest Products Decision Making** (2 cr). Alt/yrs. Open to FWR students only. May not be taken for cr after ForPr 431, ForPr 477, For 383, Bus 301, or CE 482. Intro to financial and human considerations for responsible managerial decision making in forest industry; development of professional goals and personal values for forest industry managers. One or two optional 1-day field trips. Prereq: perm.

ForPr **203** (s) **Workshop** (cr arr). Prereq: perm.

ForPr **204** (s) **Special Topics** (cr arr).

ForPr **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

ForPr **230 Forest Land Measurements** (2 cr). Public Land Survey System; pacing; chaining; traverse with silva and staff compass; slope measurements; contour mapping; triangulation. First 10 wks of semester. Prereq: Math 140.

ForPr **231 Advanced Forest Land Measurements** (1 cr). Coordinate systems; using transit for horizontal curve and closed traverse layout; area calculations. Last 6 wks of semester. Prereq: ForPr 230 or perm.

ForPr **299** (s) **Directed Study** (cr arr). Prereq: perm.

ForPr **ID331 Introduction to Wood Technology** (3 cr). WSU NATRS 321. Understanding wood as a raw material; technologies and quality requirements of major forest products; wood use for construction and paper products. Two half-day field trips.

ForPr **336 Introduction to Wood Chemistry/Pulp and Paper** (3 cr). Alt/yrs. Intro to chemistry of wood structure and its effect on the utilization of wood; intro to pulp and paper technology. Prereq: Chem 103 or equiv.

ForPr **337 Physical and Mechanical Properties of Wood** (3 cr). Wood density; acoustical, thermal, electrical properties of wood; strength properties of wood. Prereq: ForPr 331 or perm.

ForPr **365 Wood Building Technology** (3 cr). Basic structural design including elementary statics and principles and technology of wood structural design. Prereq: Phys 113 or perm.

ForPr **397-398 Renewable Natural Resources Internship I-II** (cr arr). Supervised field experience with an appropriate public or private agency. Reqd for cooperative education students. Graded P/F. Prereq: perm of dept.

ForPr **400** (s) **Seminar** (cr arr). Prereq: perm.

ForPr **401 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

ForPr **403** (s) **Workshop** (cr arr).

ForPr **404** (s) **Special Topics** (cr arr).

ForPr **405** (s) **Professional Development** (cr arr). Cr earned in this course will not be accepted toward grad degree programs. Prereq: perm.

ForPr **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

ForPr **420 Pulp and Paper Technology** (3 cr) (ForPr 405). Technological overview of chemical and physical processes involved in conversion of wood into paper. Two or three optional half-day field trips. Prereq: organic chemistry or perm.

ForPr **ID&WS430 Forest Engineering and Harvesting** (3 cr). WSU NATRS 320. Survey of logging equipment capabilities; intro to cable logging systems, road layout, and design; cost analysis of logging systems; development of road and logging plans. Three days of field trips. Prereq: ForPr 230 or perm; CS 105 or equiv.

ForPr **431 Production and Cost Control in Timber Harvesting** (3 cr). Alt/yrs. Intro to production planning and cost control for logging operations; development and application of machine rates and system production rates; breakeven analysis; machine replacement; timber sale appraisal; use of microcomputers in analysis. Prereq: ForPr 430 or equiv.

ForPr **ID432 Low Volume Forest Roads** (3 cr). WSU NATRS 432. Road classification; design of forest roads; construction techniques; costing, environmental considerations, design project. Three days of field trips. Coreq: ForPr 430.

ForPr **ID433 Forest Tractor System Analysis** (3 cr). WSU NATRS 433. Planning, layout, and cost analysis of forest tractor systems, production estimating, machine capabilities, and options; layout project. Three days of field trips. Prereq: ForPr 430 or equiv.

ForPr **ID434 Cable Systems Analysis** (3 cr). WSU NATRS 434. Alt/yrs. Layout, planning, and design for cable logging systems; analysis of forces involved in cable logging; crew and terrain requirements; layout and design project; cost and equipment analysis. Three 1-day field trips. Prereq: ForPr 430 or equiv.

ForPr **435 Wood-Moisture Relationships and Drying** (3 cr). Alt/yrs. Wood moisture content, shrinking and swelling, dimensional stabilization; theory and practice of drying lumber, veneer, particles, and fibers. Prereq: ForPr 331, 337 or perm.

ForPr **436 Wood Composites** (3). Alt/yrs. Raw material, processes, properties, and markets for a number of wood composites made of particles and fibers. One full-day field trip. Prereq: ForPr 331.

ForPr **437 Wood as a Structural Material** (3 cr). Alt/yrs. Applications of mechanical behavior to wood and wood composites; structural consideration of wood materials, including beams, columns, fasteners, and miscellaneous structures. Two lec and one 3-hr lab a wk. Prereq: ForPr 337 or 365.

ForPr **438 Wood Chemistry** (3 cr). Alt/yrs. Aspects of wood chemistry in relation to its application, including utilization of wood, wood residues, and pulping by-products; pulping chemistry, pulp bleaching, and cellulose derivatives. One or two optional half-day field trips. Prereq: organic chemistry.

ForPr **440 Energy from Wood** (2 cr). Alt/yrs. Status and potential of wood as renewable energy resource; wood energy generating technologies used in the forest products industry and the residential home; environmental aspects of wood utilization for energy.

ForPr **444 Wood Products Manufacturing** (2 cr). Alt/yrs. Techniques used in primary and secondary manufacturing requirements, process flow, raw material, and product measurement. Two or three optional 1-day field trips. Prereq: ForPr 331 or equiv.

ForPr **450 Topics in Wood Technology** (1-3 cr). Alt/yrs. Course consists of three modules: (1) wood anatomy and wood species identification; (2) wood biodeterioration, preservation, adhesion, finishing, coating; and (3) energy from wood. Each module carries 1 cr. Students may sign up for one to three modules. Modules 1 is offered during the first third of the semester; module 2 during the second third; and module 3 during the last third. Two lec and two hrs of lab a wk; one optional full-day field trip. Prereq: ForPr 331 or perm.

ForPr **460 Wood Industry Tours** (1.3 cr; see headnote). Visits to a number of firms involved with various facets of forest products industry.

ForPr **461 Wood Fluid Relationships** (2 cr; see headnote). Moisture in wood and its relationship to density and specific gravity, shrinking and swelling, electrical properties, strength properties, thermoconductivity, sorption isotherms, dimensional stabilization, permeability and diffusion.

ForPr **J462/J562 Watershed Management** (2 cr). Hydrologic processes of forest and range lands; land management practices as they influence stream flow and water quality. Additional projects/assignments reqd for grad cr. One field trip.

ForPr **463 Pulp and Paper Process Lab** (2 cr; see headnote). Chemical and mechanical pulping, pulp preparation, secondary fiber, de-inking, wet end additives; lab problems and exercises supplemented by lec. One lec and one hr of lab a wk.

ForPr **464 Pulp and Paper Process Calculations** (2.7 cr; see headnote). Chemical and physical process calculations; steady and unsteady state material and energy balances applied to pulping and papermaking processes.

ForPr **465 Pulp and Paper Process Operations** (3.3 cr; see headnote). Application of principles of momentum, heat, and mass transfer to unit operations in pulp and paper industry; fluid transport; filtration; sheet forming, sedimentation, heat exchange, evaporation, gas absorption and stripping; distillation, leaching extraction, crystallization, humidification, and drying.

ForPr **466 Paper Engineering Lab** (1.3 cr; see headnote). Experiments designed to illustrate principles of momentum, heat, and mass transfer using the pilot-plant paper machine and coater.

ForPr **467 Coated Product Development** (1.3 cr; see headnote). Coating process and products (primarily paper); theory, techniques, and procedures for formulating and applying coatings; properties and uses of coated products.

ForPr **468 Senior Seminar** (1.3 cr; see headnote). Current developments in forest products.

ForPr **469 Surface and Colloid Chemistry of Papermaking** (2 cr; see headnote). Principles of surface and colloid chemistry applied to basic problems in pulp and paper manufacturing operations and products uses.

ForPr **470 Adhesion and Adhesives** (2 cr; see headnote). Intro to adhesion; physicochemical interactions at adhesive-adherend interface; polymer absorption; polymer structure and adhesive utility; wood as adherend; adhesive-wood interface; shelf-life of resins; curing; adhesive cohesion and performance; adhesives from renewable resources.

ForPr **471 Automatic Control Instrumentation** (2.7 cr; see headnote). Control of machines and processes; linear feedback control; linking of physical and biological control systems; instrumentation for control systems and industrial development studies.

ForPr **477 Topics in Forest Industries Management** (3 cr). Applied management and quality control techniques in lumber manufacturing; marketing of solid wood products; computer simulation and modeling applications for wood products manufacturing. One or two optional 1-day field trips. Prereq: ForPr 331 and perm; prereq or coreq: ForPr 444 or equivalent.

ForPr **494 Models for Resource Decisions** (4 cr). See For 494.

ForPr **496 Forest Products Seminar** (1 cr). Contemporary problems relevant to the manufacture of wood products.

ForPr **498 International Wildland Management** (1-3 cr, max 3). World approaches and problems. Prereq: sr standing and perm.

ForPr **499** (s) **Directed Study** (cr arr). For the individual student; conferences, library, field, or lab work. Prereq: sr standing, GPA 2.5, or perm.

ForPr **500 Master's Research and Thesis** (cr arr).

ForPr **501** (s) **Seminar** (cr arr). Major philosophy, management, and research problems of forest products industries; presentation of individual studies on assigned topics. Prereq: perm.

ForPr **502** (s) **Directed Study** (cr arr). Prereq: perm.

ForPr **503** (s) **Workshop** (cr arr). Selected topics in the conservation and management of natural resources. Prereq: perm.

ForPr **504** (s) **Special Topics** (cr arr).

ForPr **505** (s) **Professional Development** (cr arr). Cr earned in this course will not be accepted toward grad degree programs. Prereq: perm.

ForPr **522 Advanced Forest Roads** (3 cr). Alt/yrs. Field layout of L-line in a forest setting; curves; slope staking and clearing limits; lab analysis of soil for subgrade; lab analysis of gravel for surfacing; stability analysis; costing of alternatives. Prereq: ForPr 430.

ForPr **531** (s) **Advanced Topics in Wood Technology** (1-3 cr). Cr not allowed in both ForPr 450 and 531. Three distinct sections that each carry 1 cr: (1) wood anatomy and wood species identification (first third of semester); (2) wood biodeterioration, preservation, adhesion, finishing, coating (second third of semester); and (3) energy from wood (last third of semester). Students may register for one, two, or three sections. Students assume project leader role and conduct independent lab work (one lab report per section). Two lec and two hrs of lab a wk; one full-day field trip. Prereq: ForPr 331, 336.

ForPr **WS532 Basic Principles of Adhesion** (3 cr). WSU MSE 547.

ForPr **WS533 Reinforced Polymer and Wood-Based Composites** (3 cr). WSU MSE 548.

ForPr **534 Advanced Techniques of Timber Harvesting Analysis** (3 cr). Alt/yrs. Layout, planning, and cost analysis of timber harvesting systems using available computer analysis techniques and program; analysis of road cost and stability problems; cost control of logging operations. Two lec and one 3-hr lab a wk; three 1-day field trips. Prereq: ForPr 430 or equivalent or perm.

ForPr **WS535 Nondestructive Testing of Wood-Base Materials** (3 cr). WSU C E 536.

ForPr **WS537 Parameters for Synthesis of Wood Composition Materials** (3 cr). WSU MSE 550.

ForPr **538 Advanced Wood Chemistry** (3 cr). Chemistry of woody tissues, including lignin, cellulose, hermicelluloses, and other polysaccharides. One or two optional half-day field trips. Prereq: organic chemistry or perm.

ForPr **562 Watershed Management** (2 cr). See ForPr J462/J562.

ForPr **577 Advanced Topics in Forest Industries Management** (1-3 cr, max 6). Application of advanced techniques in computer simulation and modeling for forest products manufacturing; serve as team leader in student projects involving computer simulation modeling of lumber manufacturing; serve as team leader in studies involving management assistance to firms in forest industry. May be repeated once for cr with perm; different projects must be undertaken the second time. One to ten optional 1-day field trips. Prereq: ForPr 477, Bus 301 or CE 482 or equivalent, and perm.

ForPr **595** (s) **Problems in World Resources** (1-3 cr, max 3). Prereq: ForPr 498 or equivalent.

ForPr **597** (s) **Practicum** (cr arr). Prereq: perm.

ForPr **598** (s) **Internship** (cr arr). Prereq: perm.

ForPr **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

ForPr **600 Doctoral Research and Dissertation** (cr arr). Prereq: admission to the doctoral program in "forestry, wildlife and range sciences" and perm of dept.

Curricular Requirements

FOREST PRODUCTS (B.S.For.Prod.)

Required course work includes the university requirements (see regulation J-3) and one of the following options.

No more than 25 percent of the course work used for the forest products degree may be taken in business courses (excluding Econ 151 and 152). Specifically, of the 136 credits required, at most 33 credits taken in business courses may be counted toward the degree.

A. WOOD CONSTRUCTION AND DESIGN OPTION

This option is designed for students interested in residential and light commercial construction or design management positions that emphasize effective use of wood as a structural material. Students may focus in one of two emphasis areas. In the architectural technology emphasis area, the student will develop design skills in addition to a background in business and wood technology for positions in non-licensed design, specification writing, design-build construction, and architectural and construction liaison. Students selecting the wood construction business emphasis area will be prepared for careers that include both supervisory and managerial positions in residential and light commercial building and building materials, estimating, banking, insurance, and government agencies that deal with housing. The wood construction and design option can also provide an educational foundation for those wishing to become entrepreneurs in the area of wood construction.

Course	Credits
ForPr 331 Introduction to Wood Technology	3
ForPr 337 Physical & Mechanical Properties of Wood	3
ForPr 365 Wood Building Technology	3
ForPr 437 Wood as a Structural Material	3
ForPr 499 DS: Wood Construct/Design (design project)	2
Acctg 201 Principles of Accounting	3
Acctg 202 Managerial Accounting	3
Arch 155 Intro to Architecture	2
Arch 156 Graphic Communication	2
Arch 255 Advanced Architectural Graphics	2
Arch 256 Basic Architectural Design	3
Arch 266 Materials & Methods	3
Arch 366 Building Technology I	3
Arch 383 Architectural Site Design	3
Arch 384 Computer-Aided Design	2
Arch 463-464 Environmental Control Systems	8
Arch 499 DS: Wood Construct/Design (design project)	2
Art 101 Visual Art	3
Art 111-112 Drawing I	4
BLaw 265 Legal Environmental of Business	3
CE 218 Elementary Surveying	2
CommG 131 Fundamentals of Public Speaking	2
CS 100 Introduction to Computers & Programming or CS 102 Programming & Problem Solving for Scientists	3
Econ 151, 152 Prin of Econ or 272 Foundations of Econ Analysis	4-6
Eng 313 Business Writing or 317 Tech & Engr Report Writing	3
FWR 101 Forestry Orientation	1
Math 140 Pre-calculus Algebra & Analytic Geom or 160 Survey of Calculus	3-4
Phys 101 Fundamentals of Physics or Phys 113, 115 General Physics & Lab	4
Additional core electives	9-11

And one of the following emphasis areas:

Architecture Technology Emphasis:

Arch 453-454 Architectural Design II	10
Electives chosen from the following	18
Art 121-122 Visual Communication & Design Process	
Bus 321 Marketing	
Bus 327 Services/Nonprofit Marketing	
Bus 412 Human Resource Management	
Bus 414 Entrepreneurship	
IntPD 261 Elements & Materials of Interior Design	

IntPD 262 Interior Design I
LArch 270 Landscape Construction
LArch 289 History of Landscape Architecture
Electives to total 136 credits for the degree ..... —

Construction Business Emphasis:

ForPr 435 Wood-Moisture Relationships & Drying 3
Acctg 381 Financial & Administrative Accounting 3
Bus 311 Introduction to Management 3
Electives chosen from the following 18
ForPr 444 Wood Products Manufacturing
ForPr 450 Topics in Wood Technology
ForPr 477 Topics in Forest Industries Mgt
Bus 321 Marketing
Bus 327 Services/Nonprofit Marketing
Bus 361 Real Estate
Bus 403 Insurance
Bus 412 Human Resource Management
Bus 414 Entrepreneurship
Bus 462 Real Property Appraisal
LArch 270 Landscape Construction
Electives to total 136 credits for the degree ..... —

B. TIMBER HARVESTING OPTION

This program area prepares students to work as managers and designers of logging operations in small timber harvesting firms, larger forest products companies, forest engineering consulting organizations, and government agencies. The program provides background in planning and design of harvesting plans and timber sales, supervision of logging crews, design and layout of roads, management of logging operations, and wood procurement. Other positions can be found in the areas of equipment development and marketing and as technical representatives for equipment companies.

For the business emphasis of this option, no more than 25 percent of the course work counted to the Forest Products degree may be taken in business courses (excluding Econ 151 and 152). Specifically, of the 136 credit hours required, at most 33 credits taken in business courses may be counted toward the degree.

Course **Credits**

ForPr 177 Forest Products Decision Making 2
ForPr 331 Introduction to Wood Technology 3
ForPr 430 Forest Engineering and Harvesting 3
ForPr 431 Production & Cost Control 3
ForPr 432 Low Volume Forest Roads 3
ForPr 433 Forest Tractor System Analysis 3
ForPr 434 Cable Systems Analysis 3
ForPr 444 Wood Products Manufacturing 2
Biol 201 Introduction to the Life Sciences 4
Biol 203 General Botany 4
Chem 111 Principles of Chemistry 4
CommG 131 Fundamentals of Public Speaking 2
CS 102 Programming & Problem Solving for Scientists 3
Econ 151, 152 Prin of Econ or 272 Foundations of Econ Analysis 4-6
Eng 313 Business Writing or 317 Tech & Engr Report Writing 3
FWR 101 Forestry Orientation 1
For 221 Forest Ecology 3
For 274 Forest Measurement Techniques 1
For 275 Aerial Photo Interpretation 2
For 308 Forest Soil Management 3
For 374 Forest Mensuration 3
For 383 Economics for Natural Resource Managers 3
Math 180 Analytic Geometry & Calculus I 4
Phys 210 Engineering Physics I 3
Stat 251 Principles of Statistics 3
Social sciences and humanities electives 8-10

And one of the following emphasis areas:

Technical Emphasis

CE 211 Engineering Measurements 3
CE 316 Advanced & Route Surveys or 317 Land Surveying 2-3
CE 321 Hydrology 3
CE 482 Project Engineering 4
CS 105 FORTRAN Programming for Engineers 2
ES 210 Engineering Statics 3
ES 220 Engineering Dynamics 3
For 370 Principles of Forest Management 2
Math 190 Analytic Geometry & Calculus II 4
Phys 211 Engineering Physics II 3
Electives chosen from the following 9
Chem 114 General Chemistry
CE 386 Engineering Economy
CE 460 Soil Mechanics
EE 207 Introduction to Electrical Engineering
ES 320 Fluid Mechanics
ES 321 Thermodynamics & Heat Transfer
ES 340 Mechanics of Materials
Math 200 Analytic Geometry & Calculus III
Math 310 Ordinary Differential Equations
Electives to total 136 cr for the degree ..... —

Resource Emphasis

ForPr 230, 231 Forest Land Measurements 3
Bot 241 Systematic Botany 3
CE 317 Land Surveying 2
For 301 Wildland Ecology 4
For 324 Silviculture 3
For 462 Watershed Management 2
For 474 Forest Resource Inventories 2
For 494 Models for Resource Decisions 4
Electives chosen from the following 13
ForPr 477 Topics in Forest Industries Management
CE 321 Hydrology
ES 210 Engineering Statics
For 320 Dendrology
For 367 Wildland Fire Management
For 463 Watershed Analysis & Planning
For 470 Forest Land Resources Planning
For 476 Forest Investment Analysis
For 477 Forest Harvest Scheduling
For 484 Forest Policy & Administration
Math 190 Analytic Geometry & Calculus II
Range 351 Elements of Range Management
ResRc 235 Sociology of Natural Resources
WLF 390 Principles of Fish & Wildlife Ecology
Electives to total 136 cr for the degree ..... —

Business Emphasis

ForPr 230, 231 Forest Land Measurements 3
Acctg 201 Principles of Accounting 3
Acctg 202 Managerial Accounting 3
Bus 301 Financial Management 3
Bus 311 Introduction to Management 3
Bus 332 Quantitative Methods in Business or CE 482 Project Engineering or For 494 Models for Resource Decisions 3-4
CE 317 Land Surveying 2
For 370 Principles of Forest Management 2
For 462 Watershed Management 2
Electives chosen from the following 11-12
ForPr 477 Topics in Forest Industries Management
Acctg 381 Financial & Administrative Accounting
BLaw 265 Legal Environment of Business
Bus 321 Marketing
Bus 350 Management Information Systems
Bus 370 Production/Operations Management
Bus 412 Human Resource Management
Bus 414 Entrepreneurship
Bus 415 Small Business Management
Bus 441 Labor Relations
Bus 474 Internatl Business or Econ 474 Internatl Economics
ES 210 Engineering Statics
For 476 Forest Investment Analysis
For 477 Forest Harvest Scheduling
Math 190 Analytic Geometry & Calculus II
Electives to total 136 cr for the degree ..... —

C. FOREST PRODUCTS BUSINESS MANAGEMENT OPTION

This program is designed for students who plan careers in the staff or line management of firms in the forest products industry. Graduates are prepared for positions in production management, marketing and distribution of wood products, and in the technical service and support areas of the forest products industry. Students focus on the production, distribution, and marketing of wood products from a combined technical and managerial perspective. The degree also provides a foundation for pursuing a graduate degree in business, for example, the M.B.A. or M.S.

Course **Credits**

ForPr 177 Forest Products Decision Making 2
ForPr 230 Forest Land Measurements 2
ForPr 331 Introduction to Wood Technology 3
ForPr 336 Introduction to Wood Chemistry/Pulp & Paper 3
ForPr 337 Physical & Mechanical Properties of Wood 3
ForPr 430 Forest Engineering & Harvesting 3
ForPr 435 Wood-Moisture Relationships & Drying 3
ForPr 437 Wood as a Structural Material 3
ForPr 444 Wood Products Manufacturing 2
ForPr 450 Topics in Wood Technology 3
ForPr 477 Topics in Forestry Industries Management 3
Acctg 201 Principles of Accounting 3
Acctg 202 Managerial Accounting 3
Acctg 381 Financial & Administrative Accounting 3
Biol 201 Introduction to the Life Sciences 4
BLaw 265 Legal Environment of Business 3
Bus 301 Financial Management 3
Bus 311 Introduction to Management 3
Bus 321 Marketing 3
Bus 332 Quantitative Methods in Business 3
Bus 350 Management Information Systems 3
Bus 370 Production/Operations Management 3
Chem 103 Introduction to Chemistry 4
CommG 131 Fundamentals of Public Speaking 2
CS 100 Introduction to Computers & Programming 3
CS 105 FORTRAN Programming for Engineers or CS 102 Programming & Problem Solving for Scientists 2-3
Econ 151, 152 Principles of Economics 6
Eng 313 Business Writing 3
For 370 Principles of Forest Management 2
FWR 101 Forestry Orientation 1

Math 111 Finite Mathematics	4
Math 160 Survey of Calculus	4
Phil 101 Ethics	3
Phys 101 Fundamentals of Physics	4
Stat 251 Principles of Statistics	3
Humanities or social science courses to satisfy regulation J-3	6
Electives to total 136 cr for the degree	—

D. PULP AND PAPER TECHNOLOGY OPTION

This innovative cooperative program allows the student to take advantage of courses at both UI and the University of Minnesota. Senior year courses are taken at the University of Minnesota while the student continues to register at UI. Graduates are prepared for employment in the pulp and paper industry as process engineers and this entry position can lead to work in careers in pulp and paper mills in areas such as production engineering, plant supervision, and quality control. Salaries are similar to those of engineering graduates with the pulp and paper industry projecting good growth over the next two decades.

Course	Credits
ForPr 331 Introduction to Wood Technology	3
ForPr 420 Pulp & Paper Technology	3
ForPr 438 Wood Chemistry	3
ForPr 462 Manufacturing Processes	2
ForPr 463 Pulp & Paper Process Lab	2
ForPr 464 Pulp & Paper Process Calculations	2.7
ForPr 465 Pulp & Paper Process Operations	3.3
ForPr 466 Paper Engineering Lab	1.3
ForPr 467 Coated Product Development	1.3
ForPr 468 Senior Seminar	1.3
ForPr 469 Surface & Colloid Chemistry of Papermaking	2
ForPr 471 Automatic Control Instrumentation	2.7
ChE 223 Material & Energy Balances	3
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chemistry or 114 General Chemistry	4-5
Chem 277, 278 Organic Chemistry I & Lab	4
Chem 302 Principles of Physical Chemistry	3
Chem 372 Organic Chemistry II	3
CommG 131 Fundamentals of Public Speaking	2
CS 105 FORTRAN Programming for Engineers or CS 102 Programming & Problem Solving for Scientists	2-3
Econ 151, 152 Principles of Economics	6
ES 210 Engineering Statics	3
ES 220 Engineering Dynamics	3
ES 320 Fluid Mechanics	3
ES 321 Thermodynamics & Heat Transfer	3
Eng 317 Technical & Engineering Report Writing	3
FWR 101 Forestry Orientation	1
Math 180, 190, 200 Analytic Geometry & Calculus	11
Math 310 Ordinary Differential Equations	3
Phys 210, 211 Engineering Physics I, II	6
Stat 301 Probability & Statistics	3
Electives to total 136 cr for the degree	—

Academic Minor Requirements

FOREST PRODUCTS MINOR

For students in business, engineering, forestry, or vocational education who wish to gain specific background and knowledge related to the forest products industry.

Course	Credits
ForPr 331 Introduction to Wood Technology	3
ForPr 336 Introduction to Wood Chemistry/Pulp & Paper	3
ForPr 337 Physical & Mechanical Properties of Wood	3
ForPr 430 Forest Engineering & Harvesting	3
ForPr 444 Wood Products Manufacturing	2
For 370 Principles of Forest Management	2
One of the following courses	3
ForPr 431 Production & Cost Control in Timber Harvesting	
ForPr 450 Topics in Wood Technology	
ForPr 477 Topics in Forest Industries Management	

Department of Forest Resources

Joseph J. Ulliman, Dept. Head (204 FWR Bldg.). Faculty: David L. Adams, George H. Belt, Jr., Steven J. Brunsfeld, Brian C. Dennis, Lauren Fins, Jo Ellen Force, Charles R. Hatch, John C. Hendee, Gary E. Machlis, Ronald L. Mahoney, John D. Marshall, Charles W. McKetta, E. Lee Medema, James A. Moore, Penelope Morgan, Leon F. Neuenschwander, Harold L. Osborne, Arthur D. Partridge, Charles T. Stiff, Molly W. Stock, Karel J. Stoszek, Joseph J. Ulliman, David L. Verbyla, David L. Wenny. Adjunct Faculty: James E. Lotan, Robert L. Mahler, Jay O'Laughlin, M. Henry Robison, Donald R. White.

Forestry is "managing and using for human benefit the forest lands and natural resources that occur on and in association with forest lands." Forest management deals not only with the production of timber crops but also with the other plants, animals, soil, and water. One-third of the nation's land area and 40 percent of Idaho's land area are forested. It is imperative that the managers of these lands and of the valuable resources thereon be properly prepared for the task of producing on a continuing basis the many goods and services desired and demanded by the population. With an ever decreasing forest land base and a steady increase in demand for forest products, the practice of forestry is rapidly becoming more complex. Present-day forest management, thus, requires professionals highly trained in an interdisciplinary approach that adapts to scientific developments and sociological and economic constraints for managing a sustainable forest ecosystem.

The instructional goal of the Department of Forest Resources is to provide both undergraduate and graduate students, including international students, a high-quality general education and the professional knowledge of significant concepts, multiple use principles, and technical details of forest resources biology, measurements, management, policy, and administration to properly manage forest resources.

To the attainment of this goal, the departmental faculty and administration will: emphasize the dynamic nature of the sciences and technologies by teaching new concepts and methods and revising the curriculum as necessary; stress understanding rather than rote learning of facts, principles rather than routines; provide challenging programs to develop individual talents and interests; maintain class sizes in laboratory and field-oriented courses at a level commensurate with instructional effectiveness; maintain student-faculty ratios that allow for more personalized instruction and advising; expand and improve instructional facilities; develop more efficient and effective instructional techniques to better utilize faculty and facilities; expand field-oriented programs, especially at the Experimental Forest and the Forest Nursery, at Moscow and other field stations; encourage and assist students in finding seasonal professional employment and opportunities for involvement in student clubs and professional organizations; develop continuing education programs for professionals in the field; and encourage development and research programs for faculty to increase their abilities in order to pass their knowledge on to others.

The forest resources curricula not only provide students with an interdisciplinary education, but also the opportunity to emphasize areas of individual interest, such as computer applications in forestry, aerial-photo interpretation (remote sensing), silviculture, forest genetics and tree improvement, protection against insects, disease, and fire, and forest soils, by selective use of elective credits.

The college's well-equipped building in Moscow, along with the nearby experimental forest, nursery/greenhouse, and field campuses at McCall and Clark Fork, are among the excellent facilities available for instructional and research use.

The department offers programs leading to the degrees of Bachelor of Science in Forest Resources, with options in administration (business), management, and science; Master of Science (thesis and nonthesis options); Master of Forestry; and the Doctor of Philosophy, with a major in forestry, wildlife, and range sciences (administered at the college level for all departments).

The three specialty options in the forest resources undergraduate curriculum provide each student with an opportunity to select a course of study suited to his or her primary career goal. The forest management option is designed for the student who wants to emphasize his or her understanding of forest biology while learning the application of technical forestry principles to the operation of a forest. The science option provides flexibility of curricular programming for the student who has specific curricular objectives not readily obtainable under the management option. It is particularly attractive for the student who anticipates going on to graduate study. Entry into the science option requires a 2.5 grade-point average, at least one semester in residence in the department, and petition to a committee of the department. The program for each student is individually designed by the student in consultation with and approval of the committee and appropriate advisers. The ad-

ministration option combines basic forest biological skills with the business management and administrative skills necessary for such positions in both public and private forestry. A library orientation session during the first semester on campus and a four-week summer camp following the sophomore year are required for all options.

Further information can be obtained from the department head (208/885-7952) or from the coordinator of graduate studies (208/885-6126).

Forest Resources Courses

PREREQUISITE: Courses in this subject field numbered above 299 are not open to any undergraduate student who is on academic probation.

For **102 Introduction to Forest Management** (1 cr). Intro to forestry, current management issues, timber and non-timber resources, educational and professional opportunities.

For **200** (s) **Seminar** (cr arr). Prereq: perm.

For **203** (s) **Workshop** (cr arr). Prereq: perm.

For **204** (s) **Special Topics** (cr arr).

For **205 Wildland Resource Conservation** (3 cr). Not open to majors in the dept. Concepts of forest and rangeland ecology; major resources of wildlands, principles of conservation and management application to wildlands.

For **206 Wildland Resource Conservation Lab** (1 cr). Descriptive survey of renewable natural resources; emphasis on Idaho's flora and fauna. Two hrs of lab a wk; three days of field trips. Coreq: For 205.

For **208 Community and Urban Forestry** (2 cr). Community or urban environment as affected by its included forest; forest components, benefits, liabilities, values, ordinances, and issues; management by selection, design, planting, care, and maintenance.

For **216 Tree Identification** (2 cr). Not open to majors in the dept. Identification, distribution, and economic value of important trees of western U.S.; emphasis on Idaho trees. One lec and one 2-hr lab a wk; one 1-day field trip.

For **221 Forest Ecology** (3 cr). Same as Range 221. Ecological basis for the management of vegetation, especially forests. Prereq or coreq: general botany and perm.

For **235 Sociology of Natural Resources** (2 cr). Same as ResRc and Soc 235. Sociological perspective applied to natural resources management; relationship between natural resources and human social systems; analysis of resource issues.

For **274 Forest Measurement Techniques** (1 cr). Field techniques and theory of forest tree and stand measurements; inventory procedures. Accelerated last six wks. Prereq: Math 140, 179.

For **275 Aerial Photo Interpretation of Renewable Natural Resources** (2 cr). Quantitative and qualitative evaluation of aerial photos for planning and decision making in renewable natural resource management. One lec and one lab a wk. Prereq: college algebra.

For **299** (s) **Directed Study** (cr arr). Prereq: perm.

For **301 Wildland Ecology** (4 cr). Same as Range 301. Ecological principles, methods, and concepts applied to forest, range, wildlife, and fishery management; ecological basis for integrated management of wildland. Four wks all-day lec/lab. Prereq: For 221 and systematic bot.

For **303 Forest Resources Conservation** (2 cr). Ecosystem approach to resource management on forest and range lands; management practices integrating timber, range forage, wildlife, fish, water, and recreation resources, stressing principles that lead to their conservation. Two wks of all-day summer camp. Prereq: course in a biological science.

For **305 Farm Forestry** (2 cr). The farm woodlot; growing wood products; seasoning, preservation, use, and marketing of farm forest products; windbreak and shelterbelt planting; forestry in the economics of agriculture. Prereq: jr standing in ag.

For **308 Forest Soil Management** (3 cr). Characteristics of forest soils; emphasis on management problems and solutions.

For **320 Dendrology** (3 cr). Identification, classification, distribution, and associations of the important tree species of the U.S.; important regional shrubs. Two lec and two 2-hr labs a wk; two 1-day field trips. Prereq: systematic botany.

For **324 Silviculture** (3 cr). Cutting systems, cultural operations, and characteristics of important commercial species. Two lec and one 3-hr lab a wk; one or two 1-day field trips. Prereq: For 301.

For **361 Farm and Natural Resource Appraisal** (3 cr). See AgEc 361.

For **367 Wildland Fire Management** (2 cr). Alt/yrs. Same as Range 367. Fire management based on wildland fuels, fire weather, and fire behavior; minor emphasis on fire history, control, and use; effect of fire on the ecosystem. Prereq: For 301 or perm.

For **370 Principles of Forest Management** (2 cr). Not open to majors in forest resources. Forest regions and industries; silvicultural principles and practices employed in timber production and use; interrelations between wood production and other uses of forest land.

For **ID374 Forest Mensuration** (3 cr). WSU NATRS 313. Theory of log, tree, and stand measurements; elementary forest sampling, variable probability sampling, growth studies. Three hrs of lec and one 1-hr recitation a wk. Prereq: For 274, Stat 251, CS 105, and Math 160 or 180.

For **383 Economics for Natural Resource Managers** (3 cr). Same as AgEc 383. Role of economic forces in resource analysis and conservation; planning of forest resource use by the firm and society. Prereq: Econ 151 and 152 or 272, Math 160 or 180.

For **397-398 Renewable Natural Resources Internship I-II** (cr arr). Supervised field experience with an appropriate public or private agency. Reqd for cooperative education students. Graded P/F. Prereq: perm of dept.

For **400** (s) **Seminar** (cr arr). Prereq: perm.

For **401 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

For **403** (s) **Workshop** (cr arr). Prereq: perm.

For **404** (s) **Special Topics** (cr arr).

For **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

For **J412/J512 Artificial Regeneration** (2 cr). Methods of cone collection, seed extraction, and storage; seedling procurement contracts; seedling handling and storage; planting contracts; regeneration surveys; plantation failure diagnosis. Cr earned in For 512 by preparation of paper on approved regeneration topic. One lec and one 3-hr lab a wk. Prereq: perm.

For **ID-J413/ID-J513 Forest Nursery Management** (2 cr). WSU NATRS 413/513. Forest nursery design considerations; seed processing and quality; nursery equipment and cultural practices; seedling quality. Cr earned in For 513 by preparation of paper on nursery design and growing regimes for assigned species. Two 1-day field trips.

For **WS415 Remote Sensing Applied to Terrain Evaluation** (3 cr). WSU Soils 474.

For **J420/J520 Tropical Dendrology/Ecology** (3 cr). Distribution, physiognomy, and climate of world tropical and subtropical vegetation types; identification, ecology, and uses of major pantropical trees and associated vegetation. Cr earned in For 520 by preparation of paper on a specific genus or species. Two lec and 4 hrs of lab a wk. Prereq: perm.

For **426 Fire Ecology** (2 cr). Alt/yrs. Same as Range 426. Cr will not be allowed in both For 426 and 526; grad students should take For 526. Fire-related synecology and autecology of dominant species in wildland habitats; effects of fire suppression, prescribed burning, and fire management. Three days of field trips. Prereq: For 301 or equivalent or perm.

For **427 Prescribed Burning Lab** (2 cr). Alt/yrs. Same as Range 427. Fire use planning with emphasis on preparation, execution, and evaluation. Eight days of field trips. Prereq: For 367, sr standing, and perm.

For **ID-J428/ID-J528 Forest Genetics and Tree Improvement** (3 cr). Same as Genet J428/J528. WSU NATRS and GenCB 427/527. Application of genetic principles to improvement of forest trees: heritability and genetic gain, genetic implications of silvicultural practices, development of applied programs, clonal forestry, and economic considerations. Two field trips. Cr earned in For 528 by seminar preparation and presentation. Prereq: For 324 or perm of instructor.

For **J458/J558 Agroforestry** (2 cr). See Range J458/J558.

For **J462/J5622 Watershed Management** (2 cr). Hydrologic processes of forest and range lands; land management practices as they influence stream flow and water quality. Additional projects/assignments reqd for grad cr. One field trip.

For **463 Watershed Analysis and Planning** (3 cr). Procedures and techniques for analyzing the impact of land management practice on the hydrologic characteristics of forest catchments. Two lec and one 2-hr lab a wk. Prereq: For 462 or perm.

For **464 Forest Pathology** (3 cr). Alt/yrs. Pathology, symptomatology, and identification of causes of diseases and decays; disease control and prevention by means of silviculture, management, and use. One lec and two 3-hr labs a wk; occasional lab trip. Prereq: For 301 or perm.

For **465 Forest Protection** (2 cr). Key abiotic and biotic disturbance factors; causal relationships, forest dynamics interactions, effects on product or amenity value yields; management considerations; hazard predictions, silvicultural preventions and controls. Two days of field trips. Prereq: For 324 or perm.

For **467 Applied Forest Entomology** (3 cr). Alt/yrs. Influence of insects on forestry practices and on the forest ecosystem; identification, ecology, survey, and control of major forest insect pests. Two lec and one 3-hr lab a wk.

For **470 Introduction to Forest Land Resources Planning** (2 cr). Multiple-objective land-use planning concepts; current techniques and methods applied to forest and range lands. Prereq: sr standing.

For **ID472 Remote Sensing of Environment** (3 cr). WSU Soils 472. Current systems, data acquisition on ground and from remote locations, instrumentation, imagery interpretation and analysis, applications for natural resources.

For **474 Forest Resource Inventories** (2 cr). Log scaling; defect determination in standing timber; fixed plot, variable plot, and 3-P sampling; cruise design and implementation; timber appraisal, regeneration, soil, downed woody fuel, watershed, and range surveys. Two 1-day field trips. Prereq: For 275 and 374.

For **476 Forest Investment Analysis** (2 cr). Timber management decisions for biological and financial production objectives; stand maturity, treatment feasibility, forest valuation and taxation, trade-offs with alternative land uses. Two lec and 1 hr of lab a wk. Prereq: For 324, 374, 383, or perm.

For **477 Forest Harvest Scheduling** (2 cr). Forest output flow regulation for sustained yield and financial objectives; simulation and optimization techniques in timber planning, timber supply models, multiple-use interactions. Two lec and 2 hrs of lab a wk. Prereq: For 324, 374, 383, and Bus 332 or For 494 or perm.

For **478 Western Forestry Practices** (1 cr). Field tour of coastal and transition forests; comparative analysis of differing forest management strategies and practices. One 8-day field trip. Prereq: sr standing or perm.

For **484 Forest Policy and Administration** (2 cr). Evaluation of land and forest problems and policies in the U.S.; analysis of current conditions and policies; historical development of governmental and private agencies concerned with the administration of forest conservation program.

For **494 Models for Resource Decisions** (4 cr). Same as ForPr 494. Use of mathematical models of resource systems to explore management strategy; problem analysis; systems concepts and optimization of resource allocation. Prereq: Math 160 or 180 and CS 105. Prereq or coreq: Stat 251 or equivalent.

For **J495/J595 International Wildland Management** (1-3 cr, max 3). World approaches and problems. Additional projects/assignments reqd for grad cr. Prereq: sr or grad standing and perm.

For **J496/J596 Field Studies in Tropical Ecology and Dendrology** (3 cr). Extensive three-wk field course in the tropics; emphasis on primary and secondary vegetation types, land-use problems, utilization of pantropical trees. Graded P/F. Additional projects/assignments reqd for grad cr. Prereq: For J420/J520 and perm.

For **499** (s) **Directed Study** (cr arr). For the individual student; conferences, library, field, or lab work. Prereq: sr standing, GPA 2.5, and perm.

For **500 Master's Research and Thesis** (cr arr).

For **501** (s) **Seminar** (cr arr). Major philosophy, management, and research problems of wildlands; presentation of individual studies on assigned topics. Prereq: perm.

For **502** (s) **Directed Study** (cr arr). Prereq: perm.

For **503** (s) **Workshop** (cr arr). Selected topics in the conservation and management of natural resources. Prereq: perm.

For **504** (s) **Special Topics** (cr arr).

For **506 Interpretation of Natural Resource Research** (2 cr). Evaluation of research literature and its translation into managerial terms; interpretation and presentation of data; technical transfer; preparation and presentation of written and oral critiques of current research literature.

For **510 Fundamentals of Research** (2 cr) (For 505). Objectives and techniques of research; the scientific method; use of scientific literature; creativity in research; communication skills; preparation of work plans and grant proposals.

For **WS511 Population and Quantitative Genetics** (3 cr). WSU GenCB 511.

For **512 Artificial Regeneration** (2 cr). See For J412/J512.

For **ID513 Forest Nursery Management** (2 cr). See For J413/J513.

For **520 Tropical Dendrology/Ecology** (2 cr). See For J420/J520.

For **521 Advanced Forest Soils** (3 cr). Alt/yrs. Wildland soils, relation to vegetation; emphasis may be varied according to the specific interests of students. Two lec and one lab a wk; one or two 1-day field trips. Prereq: perm.

For **523 Forest Community Classification** (2 cr). Field course in structure and identification of undisturbed and disturbed forest communities; practice in habitat type delineation as applied in western U.S. Accelerated first nine wks; one lec and one 8-hr field lab a wk. Prereq: perm.

For **524 Quantitative Silviculture** (2 cr). Quantifying site quality, measures of stand density, predicting forest growth and yield, simulation models, and use of simulation models in silvicultural prescriptions.

For **525 Advanced Silviculture** (3 cr). Silvicultural systems and cultural practices; design of silvicultural prescriptions. Term project, field labs, and two days of field trips. Prereq: For 324 and/or perm.

For **526 Fire Management and Ecology** (3 cr). Alt/yrs. Same as Range 526. Cr will not be allowed in both For 426 and 526. Integrating fire-related biological, ecological, physical, and technological information for land managers; autecology and synecology of dominant species in wildland habitats; natural role of fire; fire as a management tool. Five days of field trips. Prereq: For 301, 367, or perm.

For **ID528 Forest Genetics and Tree Improvement** (3 cr). See For J428/J528.

For **WS536 Modeling and Simulation of Ecological Systems** (3 cr). WSU Cpt S 536.

For **WS540 Cytogenetics** (3 cr). Alt/yrs. WSU GenCB 540.

For **549 Tropical Soils** (3 cr). See Soils 549.

For **ID555 Statistical Ecology** (3 cr). Same as Stat 555. WSU Stat 555. Alt/yrs. Stochastic models in ecological work; discrete and continuous statistical distributions, birth-death processes, diffusion processes; applications in population dynamics, population genetics, ecological sampling, spatial analysis, and ecological diversity. Prereq: Math 451.

For **558 Agroforestry** (2 cr). See For J458/J558.

For **562 Watershed Management** (2 cr). See For J462/J562.

For **564 Advanced Forest Pathology** (2-4 cr). Alt/yrs. Field methods, lab techniques, and original literature used in study of tree diseases and rots, organisms that cause them, and deterioration of wood products; seminar in selected problems in forest pathology and their relations to forest practices. Prereq: For 464.

For **569 Advanced Forest Entomology** (3 cr). Alt/yrs. Methods and applications of biological and economic evaluation and control strategies of forest insect populations in relation to pest management programs. One 2-hr seminar and one 2-hr lab a wk; two 1-day field trips. Prereq: For 467 or perm.

For **ID&WS572 Advanced Remote Sensing** (2 cr). WSU Geol and ES/RP 574. Alt/yrs. Digital image processing systems applied to satellite and other remote sensing systems. Prereq: For 472, CS 105 or perm.

For **573 Advanced Aerial Photo Interpretation** (2-3 cr). Alt/yrs. Project planning; interpretation of vegetation, landforms, land use, disease and insect infestation, pollution, sequential changes, high-altitude-satellite imagery; mapping, photo-mensurational tech; multistage sampling, and special problems. One lec and one 2- or 4-hr lab a wk; two 1-day field trips. Prereq: For 275 or equiv, or perm.

For **574 Advanced Forest Mensuration** (2 cr). Alt/yrs. Mathematical and statistical principles and techniques in determination of volume and growth of trees and stands; application of sampling theory and correlation analysis. Prereq: For 374 or equivalent and course in statistical methods, preferably beyond the elementary course.

For **575 Advanced Forest Management** (2 cr). Alt/yrs. Forest regulation; recent development in applied forest management and important contributions in forest management.

For **ID581-582 Advanced Forest Economics** (2 cr). WSU NATRS 511. For 582 alt/yrs. Economic principles, legislation, and policies affecting forestry, particularly those bearing on the character and intensity of land use.

For **586 Social Ecology of Natural Resources** (3 cr). See ResRc 586.

For **589 Water Resources Seminar** (1 cr). See Inter 589.

For **595 International Wildland Management** (1-3 cr, max 3). See For J495/J595.

For **596 Field Studies in Tropical Ecology and Dendrology** (3 cr). See For J496/J596.

For **597** (s) **Practicum** (cr arr). Prereq: perm.

For **598** (s) **Internship** (cr arr). Prereq: perm.

For **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

For **600 Doctoral Research and Dissertation** (cr arr). Prereq: admission to the doctoral program in "forestry, wildlife and range sciences" and perm of dept.

Curricular Requirements

FOREST RESOURCES (B.S.For.Res.)

Required course work includes the university requirements (see regulation J-3) and one of the following options:

A. MANAGEMENT OPTION

Course	Credits
FWR 101 Forestry Orientation	1
For 102 Introduction to Forest Management	1
For 221 Forest Ecology	3
For 235 Sociology of Natural Resources	2
For 274 Forest Measurement Techniques	1
For 275 Aerial Photo Interpretation	2
For 301 Wildland Ecology	4
For 308 Forest Soil Management	3
For 320 Dendrology	3
For 324 Silviculture	3
For 367 Wildland Fire Management or 464 Forest Pathology or 467 Applied Forest Entomology	2-3
For 374 Forest Mensuration	3
For 383 Economics for Natural Resource Managers	3
For 462 Watershed Management	2
For 465 Forest Protection	2
For 470 Introduction to Forest Land Resources Planning	2
For 474 Forest Resource Inventories	2
For 476 Forest Investment Analysis	2
For 477 Forest Harvest Scheduling	2
For 478 Western Forestry Practices	1
For 484 Forest Policy & Administration	2
For 494 Models for Resource Decisions	4
Biol 201 Introduction to the Life Sciences	4
Biol 203 General Botany	4
Bot 241 Systematic Botany	3
Chem 103 Intro to Chemistry or 111 Principles of Chemistry	4
CommG 131 Fundamentals of Public Speaking	2
CS 102 Programming & Problem Solving for Scientists	3
Econ 151, 152 Principles of Economics	6
Eng 317 Technical & Engineering Report Writing	3
ForPr 230 Forest Land Measurements	2
ForPr 331 Introduction to Wood Technology	3
ForPr 430 Forest Engineering & Harvesting	3
Geol 101, 102 Physical Geology & Lab	4
Math 160 Survey of Calculus or 180 Analytic Geometry & Calculus	4
Range 351 Elements of Range Management or WLF 390 Principles of Fish & Wildlife Ecology	3

Range 351 or WLF 390 (course not taken above) or ResRc 385 Resource Rec & Tourism Mgt or Geog 425 Mineral Land Mgt	3
Stat 251 Principles of Statistics	3
Library orientation	0
Electives in social sc and humanities (at least 2 in social sc and at least 6 in humanities)	10
Electives to total 136 cr for the degree	—

B. SCIENCE OPTION

Note: Admission to this option requires sophomore standing and petition.

Course	Credits
FWR 101 Forestry Orientation	1
For 221 Forest Ecology	3
For 274 Forest Measurement Techniques	1
For 275 Aerial Photo Interpretation	2
For 301 Wildland Ecology	4
For 324 Silviculture	3
For 374 Forest Mensuration	3
For 474 Forest Resource Inventories	2
For 494 Models for Resource Decisions	4
Biol 201 Introduction to the Life Sciences	4
Biol 202 General Zoology	4
Biol 203 General Botany	4
Bot 241 Systematic Botany	3
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
CommG 131 Fundamentals of Public Speaking	2
CS 102 Programming & Problem Solving for Scientists	3
Econ 151, 152 Principles of Economics	6
ForPr 230 Forest Land Measurements	2
Math 180 Analytic Geometry & Calculus I or 160 Survey of Calculus	4
Stat 251 Principles of Statistics	3
Library orientation	0
Social science electives	2
Humanities electives	6
Quantitative science electives	4
Natural/social science electives	21
Professional electives	14
Electives to total 136 cr for the degree	—

C. ADMINISTRATIVE OPTION

Course	Credits
FWR 101 Forestry Orientation	1
For 102 Introduction to Forest Management	1
For 221 Forest Ecology	3
For 235 Sociology of Natural Resources	2
For 274 Forest Measurement Techniques	1
For 275 Aerial Photo Interpretation	2
For 301 Wildland Ecology	4
For 308 Forest Soil Management	3
For 320 Dendrology	3
For 324 Silviculture	3
For 374 Forest Mensuration	3
For 383 Economics for Natural Resource Managers	3
For 470 Introduction to Forest Land Resources Planning	2
For 476 Forest Investment Analysis	2
For 477 Forest Harvest Scheduling	2
For 484 Forest Policy & Administration	2
For 494 Models for Resource Decisions	4
Acctg 201 Principles of Accounting	3
Acctg 202 Managerial Accounting	3
Biol 201 Introduction to the Life Sciences	4
Biol 203 General Botany	4
Bus 301 Financial Management	3
Bus 311 Introduction to Management	3
Chem 103 Introduction to Chemistry	4
CommG 131 Fundamentals of Public Speaking	2
CS 102 Programming & Problem Solving for Scientists	3
Econ 151, 152 Principles of Economics	6
Eng 317 Tech & Engr Report Writing or 313 Business Writing	3
ForPr 230 Forest Land Measurements	2
ForPr 331 Introduction to Wood Technology	3
ForPr 430 Forest Engineering & Harvesting	3
Geol 101, 102 Physical Geology & Lab	4
Math 180 Analytic Geometry & Calculus I or 160 Survey of Calculus	4
Stat 251 Principles of Statistics	3
Library orientation	0
Social science electives	2
Humanities electives	6
Forest protection electives	2
Business management electives	6
Multiple-use management electives	5
Electives to total 136 cr for the degree	—

Forestry, Wildlife and Range Sciences (General)

John C. Hendee, Dean (202C FWR Bldg.); Ernest D. Ables, Associate Dean for Academics; Leon F. Neuenschwander, Associate Dean for Research.

Forestry, Wildlife and Range Sciences (General) Courses

PREREQUISITE: Courses in this subject field numbered above 299 are not open to any student who is on academic probation.

FWR **101 Forestry Orientation** (1 cr). Intro to forestry and related wildland management professions.

FWR **200; 400** (s) **Seminar** (cr arr). Prereq: perm.

FWR **203; 403** (s) **Workshop** (cr arr). Prereq: perm.

FWR **204; 404** (s) **Special Topics** (cr arr).

FWR **299; 502** (s) **Directed Study** (cr arr). Prereq: perm.

FWR **401 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

FWR **499** (s) **Directed Study** (cr arr). For the individual student; conferences, library, field, or lab work. Prereq: sr standing in the College of FWR, GPA 2.5, and perm.

FWR **501** (s) **Seminar** (cr arr). Major philosophy, management, and research problems of wildlands; presentation of individual studies on assigned topics. Prereq: perm.

FWR **503** (s) **Workshop** (cr arr). Selected topics in the conservation and management of natural resources. Prereq: perm.

FWR **504** (s) **Special Topics** (cr arr).

FWR **597** (s) **Practicum** (cr arr). Prereq: perm.

FWR **598** (s) **Internship** (cr arr). Prereq: perm.

FWR **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

FWR **600 Doctoral Research and Dissertation** (cr arr). Prereq: admission to the doctoral program in "forestry, wildlife and range sciences" and perm of dept.

Academic Minor Requirements

FORESTRY, WILDLIFE AND RANGE SCIENCES MINOR

Course	Credits
For 205, 206 Wildland Resource Conservation & Lab	4
At least two of the following	4-6
For 370 Principles of Forest Management	
ForPr 331 Introduction to Wood Technology	
ResRc 287 Principles of Wildland Recreation Management	
Range 351 Elements of Range Management	
WLF 390 Principles of Fish & Wildlife Ecology	
At least two of the following	4-6
For 383 Economics for Natural Resource Managers	
For 470 Introduction to Forest Land Resources Planning	
For/ResRc 235 Sociology of Natural Resources	
ResRc 386 Resource Recreation & Tourism Planning	
At least one of the following	2-6
Fish 413 Fish Ecology	
For 208 Community & Urban Forestry	
For 216 Tree Identification	
For 221 Forest Ecology	
ForPr 444 Wood Products Manufacturing	
Range 453 Rangeland Vegetation Inventory & Analysis	
ResRc 385 Resource Recreation & Tourism Management	
ResRc 387 Environmental Interpretative Methods	
WLF 445 Nongame Management	

The minimum number of credits for the minor is 18.

FRENCH—see Department of Foreign Languages and Literatures

Genetics

Faculty: Dick L. Auld, Lauren Fins, Holly A. Wichman, Raymond J. Hoff, Geral I. McDonald, Gerald E. Rehfeldt.

Though there is no genetics degree per se at the University of Idaho, many degrees emphasize genetics. Information about research programs, specifics of courses, and academic advising is available from any member of the genetics faculty.

Genetics Courses

Genet **106 Heredity and Man** (2 cr). See Biol 150.

Genet **200** (s) **Seminar** (cr arr). Prereq: perm.

Genet **299** (s) **Directed Study** (cr arr). Prereq: perm.

Genet **314 General Genetics** (3 cr). See Biol 351.

Genet **315 Experimental Genetics** (2 cr). See Biol 352.

Genet **320 Animal Breeding** (3 cr). See AnSc 320.

Genet **400** (s) **Seminar** (cr arr). Prereq: perm.

Genet **421 Population Genetics** (3 cr). See AnSc 421.

Genet **J428/J528 Forest Genetics and Tree Improvement** (3 cr). See For J428/J528.

Genet **J485/J585 Molecular Genetics I** (3 cr). See Bact J485/J585.

Genet **499** (s) **Directed Study** (cr arr). Prereq: perm.

Genet **501** (s) **Seminar** (cr arr). Prereq: perm.

Genet **502** (s) **Directed Study** (cr arr). Prereq: perm.

Genet **WS505 Population and Quantitative Genetics** (3 cr). WSU GenCB 511.

Genet **522 Statistical Genetics** (3 cr). See AnSc 522.

Genet **528 Forest Genetics and Tree Improvement** (3 cr). See For J428/J528.

Genet **537 Physiological and Molecular Genetics** (2-3 cr). See Biol 555.

Genet **WS540 Cytogenetics** (3 cr). Alt/yrs. WSU GenCB 540.

Genet **WS550 Advanced Cell Biology** (3 cr). WSU GenCB 550.

Genet **WS570 Plant Molecular Genetics** (3 cr). WSU GenCB 570.

Genet **585 Molecular Genetics I** (3 cr). See Bact J485/J585.

Genet **WS592 Advanced Topics in Cell Biology** (1-3 cr, max 7). WSU GenCB 592.

Department of Geography

Harley E. Johansen, Dept. Head (210 Mines Bldg.). Faculty: Kang-Tsung Chang, Piotr Jankowski, Harley E. Johansen, Allan Jokisaari, Scott E. Morris, Gundars Rudzitis, Sam M. W. Scripter, Allen C. Turner.

Modern geography is a way to discover and explore the world around us and to learn how to use its land and other resources for the best purpose. Geography is also a way to understand the spatial variation in natural and human phenomena such as climate, vegetation, landscape, cultural diversity, and resource management, and to use this understanding to predict future patterns. Today, geographers use their knowledge of locational patterns and their skills in spatial analysis and mapping to answer a wide range of questions in business, industry, planning, and other fields where locational decisions are common.

The geography program at UI prepares students for a variety of important and rewarding career opportunities. The Department of Geography, which is in the College of Mines and Earth Resources, offers programs leading to the degrees of Bachelor of Science in Geography and Bachelor of Science in Cartography (one of three cartography programs in the U.S.). The department also offers the major in geography leading to the B.A. or B.S. degree) through the College of Letters and Science. Each of these degree programs prepares students for a growing employment market in applied geography and cartography. Students benefit from close contact with their instructors and hands-on experience in their course work and through internships with industries and agencies involved in geographic and cartographic activities.

The B.S.Geog. curriculum provides three specialty options and a general option for students who wish to design their own programs. The B.S.Cart. curriculum prepares students for careers in map design and production using both conventional and computer-generated teaching techniques. The department has a fully equipped cartography laboratory with a large-format process camera and darkroom, a plate maker, a phototypesetter, and a digitizer that is interfaced with both micro and mainframe computers. Computing equipment also includes color graphics terminals and software in mapping and GIS. The specialty options and the cartography degree are directed toward identified areas of employment in applied geography. The B.A. and B.S curricula in geography that are offered through the College of Letters and Science are less structured degree programs and have a liberal-arts orientation.

The B.S.Geog. and B.S.Cart. are the most appropriate degrees for students who plan to continue into graduate work. The Department of Geography offers the Master of Science, the Master of Arts in Teaching (major in geography), and the Ph.D. in geography. More information about these programs may be found in the Graduate Bulletin.

Faculty members in the department will be happy to answer questions about specific programs and courses. Prospective majors in geography or cartography should get in touch with the department head (telephone 208/885-6216).

Geography Courses

Geog **100 Physical Geography** (3 cr). Satisfies core requirement J-3-b. Natural environment; nature, distribution, and relationships of climate, landforms, oceans, vegetation, hydrography, and soils.

Geog **101 Physical Geography Lab** (1 cr). Satisfies core requirement J-3-b. Lab study relevant to Geog 100. One 2-hr lab a wk. Prereq or coreq: Geog 100 or perm.

Geog **165 Human Geography** (3 cr). Intro to geographical dimension in human behavior and how this is evident in population distribution, rural and urban land use, and social, economic, and political attributes of societies.

Geog **180-181-182 Spatial Graphics I, II, III** (1 cr). Nontechnical; language of maps, aerial photography, and remote sensory imagery; understanding graphic symbol systems. Geog 180: earth as a sphere, globes and models, history of maps and map-making, the round earth on flat paper. Geog 181: sources of primary (base) map data; basic topographic maps, geologic maps and block diagrams. Geog 182: thematic special-purpose maps, space-age maps, and graphics, atlases, map intelligence. Two lec and one 1-hr lab a wk for five wks. These courses may be taken in any order.

Geog **200** (s) **Seminar** (cr arr). Prereq: perm.

Geog **203** (s) **Workshop** (cr arr). Prereq: perm.

Geog **204** (s) **Special Topics** (cr arr).

Geog **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Geog **240 Economic Geography** (3 cr). Reciprocal relations between people and the earth environment within an economic framework; resource distribution, developmental alternatives, movement, processing and industrialization, local to global perspective, theories and case studies.

Geog **250 World Regional Geography** (3 cr). Satisfies core requirement J-3-d. Countries, regions, and peoples of the world; interrelationships between humans and their physical and cultural environments.

Geog **299** (s) **Directed Study** (cr arr). Prereq: perm.

Geog **315 Geomorphology** (3 cr). See Geol 335.

Geog **316 Processes in Glacial and Periglacial Environments** (3-6 cr). See Geol 336.

Geog **ID325 Quantitative Geomorphology** (3 cr). WSU Geol 325. Process-oriented approach to geomorphic systems and quantitative analysis of force and resistance relationships that govern these processes. Prereq: Geog 100 or Geol 101 or perm.

Geog **330 Urban Geography** (3 cr). Theory and models of the functions, origin, development, structure, and distribution of cities; land-use classification; geographic aspects of city planning. One 1-day field trip. Prereq: Geog 250 or perm.

Geog **340 Business Location Decisions** (3 cr). Locational decision making in primary, secondary, and tertiary industries; resulting patterns of industrial location; importance of location and impact of industries on other characteristics of communities as demonstrated by examples from each sector. One 1-day field trip. Prereq: Geog 250 or perm.

Geog **346 Transportation** (3 cr). Structure of transportation systems and the role of these in spatial interactions; comparative advantages of air, water, highway, rail, and pipeline transport, and current development in each mode. Prereq: Geog 250 or perm.

Geog **360 Population Dynamics and Distribution** (3 cr). Same as Soc 360. Effects of fertility, mortality, and migration on population size and distribution; demographic trends in U.S. and other societies and how these relate to economic, political, environmental, and other factors. Prereq: Geog 250 or perm.

Geog **362 U.S. and Canada** (3 cr). Regional and systematic geography; emphasis on contemporary problems. Two 1-day field trips.

Geog **364 Idaho and the Pacific Northwest** (3 cr). Regional and systematic geography of the Northwest; emphasis on Idaho and contemporary problems. One 2-day field trip.

Geog **365 Political Geography** (3 cr). Conceptual approach to manifestations of political activity at every organizational level; intro to basic ideas of politics, territory, and geographic environment. Prereq: Geog 250 or perm.

Geog **370 Spatial Analysis** (3 cr). Methodological need for analyses of spatial data; spatial statistics; measurement of aggregation and concentration, description of areal distributions and gradients; regionalization techniques; intro to computer applications for spatial data. Prereq: intro courses in physical science and social science and Stat 251 or equivalent.

Geog **380 Cartography and Graphic Communication** (4 cr). For the map-using professions (e.g., agriculture, engineering, forestry, geosciences, planning). Map design and construction; maps as graphic communication devices, design and drafting processes for map creation and production. Two lec and 6 hrs of lab a wk.

Geog **385 GIS Primer** (3 cr). Same as LArch 385. Intro to basic concepts and applications of geographic information systems (GIS), lab exercises on PC-based GIS package, and guest lecturers from industry and governmental agencies. Three hrs of lec-lab a wk.

Geog **400** (s) **Seminar** (cr arr). Prereq: perm.

Geog **401 Atmospheric Environment** (3 cr). Weather, air masses, storms and associated phenomena, meteorological instruments, weather maps, forecasting; world's weather and climate types with emphasis on their effects on man. One 1-day field trip. Prereq: Geog 100-101 or Geol 101-102, or perm.

Geog **403** (s) **Workshop** (cr arr). Prereq: perm.

Geog **404** (s) **Special Topics** (cr arr).

Geog **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Geog **ID420 Land and Resource Regulation** (3 cr). WSU ES/RP 588. Legal aspects of land-use control and resource management; methods of research in law libraries for planners and resource managers not trained as attorneys. Prereq: Geog 250 or perm.

Geog **425 Mineral Land Management** (3 cr). Same as Min 425. Acquisition of mineral rights on federal, state, and private land; emphasis on laws and regulations affecting mineral development. Prereq: Geog 250 or perm.

Geog **427 Decision-Making in Resource Management** (3 cr). Theory and applications of evaluation and optimization techniques used for planning and management of natural resource systems; focus on operational knowledge of tech, potential applicability, and limitations. Prereq: Geog 250, Math 160 or Stat 251 or Geog 370 or perm.

Geog **C439 Comprehensive Urban Plan Development** (3 cr). For planning commission members, administrators, and elected officials. Relationship between urban process and environment and comprehensive urban plan development; specific elements of most comprehensive plans as applied to situations and cases in one's home city or town.

Geog **WS444 Environmental Impact Statement Assessment** (3 cr). WSU ES/RP 444/544.

Geog **447 Recreation and Tourism** (3-4 cr). Changing relationship of recreation to travel and tourism, domestic and international behavioral dynamics, trends, fads, spatial significance, economic and environmental impacts, measurement and planning techniques. Registration for 4 cr requires an additional approved semester project.

Geog **470 Computer Mapping** (3 cr). For the map-using professions (e.g., agriculture, engineering, forestry, geosciences, planning). Line printer, coordinate plotter, and interactive video displays; tradeoffs between time, cost, precision, and graphic quality; types of maps represented; geographic base files and information systems; lab exercises with standardized computer-mapping program. One lec, 2 hrs of lab, and 4 hrs computer run preparation a wk.

Geog **471 Advanced Computer Mapping** (3 cr). Continuation of Geog 470. Specialized displays of data geared to in-depth treatment of mapping programs in conjunction with statistical packages, and cartographic projection capabilities; lab exercises. Prereq: Geog 470.

Geog **ID475 Geographic Information Systems** (3 cr). WSU ES/RP 575. Spatial analysis in raster- and vector-based systems; concepts, techniques, and applications of GIS technology using microcomputer and workstation platforms. Prereq: Geog 385 or perm.

Geog **478 Interactive Carto-graphics** (3 cr). Interactive production of colored maps and geostatistical graphics on CRT screens and ink-jet printer, primarily via microcomputer systems; capabilities for color; type sizes and styles; line, point, and area symbols; graphic detail, memory requirements, computer speed, software, geocoding; program writing. Two hrs lec and 4 hrs lab a wk. Prereq: course in computing or perm.

Geog **480 Advanced Cartography and Remote Sensing** (3 cr). Problems in compilation, design, and production of complex thematic maps using state-of-the-art techniques and materials; scribing, process photography, computer cartography, remotely sensed imagery, and printing and reproduction methods to produce a printed map. One lec and six hrs of lab a wk; one 2-day field trip. Prereq: Geog 380 or perm.

Geog **485 Cartographic Production Techniques** (3 cr). Theory and practice of process (copy) camera for cartographic reproduction; line and half-tone photo, tray method film processing, pin registration, contact printing including screening and color proofing, offset platemaking. Prereq: Geog 380 or perm.

Geog **490 Trends in Geography** (3 cr). Alt/yrs. Current themes; geography as a professional field; employment as a geographer; nature of research; research proposal preparation. Prereq: advanced study in geography.

Geog **491** (s) **Field Techniques** (1-3 cr, max 6). Acquisition of data in the field, analysis, interpretation, and presentation of results of field investigations. May also be taken in conjunction with other geography courses. Prereq: perm.

Geog **492 Mineral Industry Case Studies** (3 cr). See Min 472.

Geog **497** (s) **Practicum** (1-6 cr, max 6). Practical on-the-job experience in applied geography and cartography; oral and written reports are presented in which the student reviews and constructively criticizes the experience gained.

Geog **499** (s) **Directed Study** (cr arr). Prereq: perm.

Geog **500 Master's Research and Thesis** (cr arr).

Geog **501** (s) **Seminar** (cr arr). Prereq: perm.

Geog **502** (s) **Directed Study** (cr arr). Prereq: perm.

Geog **503** (s) **Workshop** (cr arr). Prereq: perm.

Geog **504** (s) **Special Topics** (cr arr).

Geog **505 Applied Climatology** (3 cr). Climatic classifications, microclimatic investigations, instrumentation; impact of climate on agricultural, vegetation, and economic activities.

Geog **506** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Geog **510 Seminar in Physical Geography** (3 cr). Current research trends in physical geography; development of theory and methodology; process and theoretical geomorphology, physical climatology, and geographic hydrology; resource-related applications of this research.

Geog **516 Advanced Field Glaciology** (6 cr). See Geol 536.

Geog **520 Land and Resource Regulation Seminar** (3-6 cr, max 6). Current legal issues in land use control and mineral resource management. Prereq: Geog 420 or 425 or perm.

Geog **525 Plant Geography** (3 cr). See Bot 535.

Geog **526 Animal Geography** (2 cr). See Zool J438/J538.

Geog **527 Seminar in Resource Geography** (3 cr). Examination of spatial ramifications of resource issues; emphasis on fuel and non-fuel minerals and development of spatial models used in evaluation process.

Geog **529 Regional Land-Use Planning** (3 cr). Alternative regional goals, plans, structures, laws, spatial options; comparison of various domestic and foreign approaches and experiences; construction of models and scenarios of alternative proposals. One 2-day field trip.

Geog **530 Urban Systems and Structure** (3 cr). Demographic, economic, settlement, and locational characteristics of communities; emphasis on small cities and towns. Prereq: Geog 330, 360, or perm.

Geog **WS541 Planning in Rural Environments** (3 cr). WSU ES/RP 541.

Geog **WS544 Environmental Impact Statement Assessment** (3 cr). WSU Env S 544.

Geog **WS550 Methods and Processes in Regional Planning** (3 cr). WSU ES/RP 550.

Geog **570 Techniques of Regional and Urban Analysis** (3 cr). Theory and techniques for studying regional and urban phenomena from the spatial perspective; spatial structure; data and relationships among variables; projections and forecasts; models of economic activity, population, land use and transportation. Prereq: Geog 370 or Stat 251 or Math 451-452.

Geog **580 Cartography Seminar** (3 cr, max 6). Survey of cartography as a discipline and its major areas of specialization; literature of cartography; areas of applied and theoretical research; philosophy of maps. Prereq: Geog 380 or perm.

Geog **585 Cartography for Planners** (3 cr). Role of maps in the planning process; problems of the small planning agency with limited cartographic resources; principles and techniques of large-scale map compilation from various source materials, including aerial photographs; coordinate systems, multiple-use cartographic drafting, map duplication and reproduction processes, agency use of commercial firms for part or all of the map-making process. Two lec and one 3-hr lab a wk; one 1-day field trip.

Geog **WS590 Special Topics in Regional Planning** (1-3 cr). WSU ES/RP 590.

Geog **595 Public Planning Participation** (1 cr, max 2). Attendance at public-planning meetings followed by written and classroom critiques. Travel to nearby communities reqd for some meetings.

Geog **597** (s) **Practicum** (cr arr). Prereq: perm.

Geog **598** (s) **Internship** (cr arr). Practical, on-the-job experience with governmental agencies or commercial establishments; oral and written reports are presented in which the student reviews and constructively criticizes the experience gained; salary may be received for services performed. Prereq: perm.

Geog **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Geog **600 Doctoral Research and Dissertation** (cr arr).

Curricular Requirements

GEOGRAPHY (B.S.Geog.)

This program is offered through the College of Mines and Earth Resources. Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
Geog 100, 101 Physical Geography & Lab	4
Geog 165 Human Geography	3
Geog 180-181-182 Spatial Graphics	3
Geog 240 Economic Geography	3
Geog 250 World Regional Geography or 362 U.S. & Canada or 364 Idaho & the Pacific Northwest	3
Geog 370 Spatial Analysis	3
Geog 380 Cartography & Graphic Communication	4
Stat 251 Principles of Statistics	3

And completion of one of the following options (a list of recommended electives may be obtained from the departmental office; students interested in pursuing graduate studies are advised to emphasize analytical techniques in their choice of electives):

A. PHYSICAL ENVIRONMENT AND EARTH RESOURCES OPTION

This option emphasizes the interaction between natural environmental systems and human activities. Students gain a knowledge of major issues in the utilization and management of earth resources as they relate to the natural environment. They also acquire the skills necessary to solve practical problems related to resource development.

Course	Credits
Geog 315 Geomorphology or 325 Quantitative Geomorphology	3
Geog 401 Atmospheric Environment	3
Geog 491 Field Techniques	3
Courses chosen from the following	21
Geog 470 Computer Mapping	
Geog 475 Geographic Information Systems	
Geog 478 Interactive Carto-graphics	
Chem 103 Intro to Chem or 111 Principles of Chem	
CE 218 Elementary Surveying	
CS 100 Introduction to Computers & Programming or 105 FORTRAN Programming for Engineers	
Eng 317 Technical & Engineering Report Writing	
For 275 Aerial Photo Interpretation	
Math 140 Pre-calculus Algebra & Analytic Geometry	
Math 160 Survey of Calculus	
Phys 113 General Physics	
Courses chosen from the following	6
Geog 316 Processes in Glacial/Periglacial Environments	
AgE 351 Hydrology	
For 462 Watershed Management	
Geol 101, 102 Physical Geology & Lab	
Geol 409 Groundwater	
Geol 425 Sedimentology	
Soils 205 General Soils	
Electives to total 128 cr for the degree (geography cr must total at least 44)	—

B. APPLIED ECONOMIC GEOGRAPHY OPTION

This option is designed to prepare students for employment opportunities in business and industry and also in the field of planning at the regional or community scale. It emphasizes the locational aspects of economic activity and economic decision making. Students will gain an understanding of geographical patterns of markets, transactions and trade, transportation, production and consumption, industrial processing, and other aspects of the spatial economy. With this option, most students can go on to complete master's degrees in business administration or geography within one year or move directly into a growing area of employment for the business-oriented geographer.

Course	Credits
Geog 330 Urban Geography	3
Geog 340 Business Location Decisions	3
Geog 346 Transportation	3
Geog 427 Decision Making in Resource Management	3
Geog 475 Geographic Information Systems	3
Bus 321 Marketing	3
Econ 151, 152 Principles of Economics	6
Econ 430 Regional/Urban Economics	3
Eng 313 Business Writing or 317 Tech & Engr Report Writing	3
Courses chosen from the following	9
Geog 470 Computer Mapping	
Geog 471 Advanced Computer Mapping	
Geog 478 Interactive Carto-graphics	
Geog 497 Practicum (internship with a company or agency)	
Bus 421 Marketing Research & Analysis	
Econ 321 Intermediate Microeconomic Analysis	
LArch 490 Computer-Aided Regional Landscape Planning	
Math 180 Analytic Geometry & Calculus I	
Math 326 Linear Programming	
Courses chosen from the following	9
Geog 360 Population Dynamics & Distribution	
Geog 365 Political Geography	
Geog 447 Recreation & Tourism	
AgEc 332 Economics of Agricultural Development	
AgEc 451 Land & Natural Resource Economics	
Bus 325 Retailing	
Econ 415 Market Structure & Governmental Policy	
Econ 474 International Economics	
Econ 485 Environmental Economics	
Electives to total 128 cr for the degree	—

C. MINERAL PROPERTY AND LAND MANAGEMENT OPTION

This option is designed to provide a background in land-use decision making and land management. Emphasis is on mineral properties, but the techniques also apply to other resources. Courses include locational, socioeconomic, environmental, and legal aspects of land management to prepare the student for either employment or advanced study in this growing profession.

Course	Credits
Geog 315 Geomorphology or 401 Atmospheric Environment	3
Geog 330 Urban Geography or Geog 360 Population Dynamics	3
Geog 420 Land & Resource Regulation or 425 Mineral Land Mgt	3
Geog 470 Computer Mapping or 475 Geog Information Systems or 478 Interactive Carto-graphics	3
Geog 492 Mineral Industry Case Studies	3
AgEc 451 Land & Natural Resource Economics or Econ 430 Regional/ Urban Economics or Econ 485 Environmental Economics	3
Bus 462 Real Property Appraisal	3
CE 218 Elementary Surveying	2
CS 105 FORTRAN Programming for Engineers	2
Econ 151, 152 Principles of Economics	6
Eng 313 Business Writing or 317 Technical & Engr Report Writing	3
Math 140 Pre-calculus Algebra & Analytic Geometry	3
PolSc 451 Public Administration or 452 Administrative Law	3
Approved geography electives	6
Electives to total 128 cr for the degree	—

D. GENERAL OPTION

For students interested in geography but not in one of the specialty options, this option allows them to design their own curricula with the approval of a geography faculty adviser.

Course	Credits
Math 140 Pre-calculus Algebra & Analytic Geometry	3
Approved electives in geography (not incl Geog 480, 485)	27
Approved electives to total 128 cr for the degree	—

GEOGRAPHY (B.A. or B.S.)

This program is offered through the College of Letters and Science. Required course work includes the university requirements (see regulation J-3), the general College of L˜&˜S requirements for either the B.A. or B.S. degree, and:

Course	Credits
Geog 100, 101 Physical Geography & Lab	4
Geog 165 Human Geography	3
Geog 240 Economic Geography	3
Geog 250 World Regional Geography	3
Geog 380 Cartography & Graphic Communication	4
Geog 490 Trends in Geography	3
Geol 101, 102 Physical Geology & Lab	4
Geography electives (upper-division)	18
Related fields approved by the Dept of Geography	20

CARTOGRAPHY (B.S.Cart.)

This program is offered through the College of Mines and Earth Resources. It emphasizes graphic design and communication and both computerized and conventional techniques of production cartography. It provides extensive applied professional cartographic training and exposure to theoretical-research oriented aspects of the field. Students who complete this program should be capable of eventually occupying supervisory positions in graphic sections of organizations producing maps and allied graphic products. To provide these students with a realistic education, the department has developed a modern, fully equipped graphic arts laboratory (Cart-O-Graphics) that has the capacity to execute all necessary map-making functions from original drafting or scribing to press-ready printing plates. The laboratory provides talented and interested students with the opportunity to solve real cartographic problems, gaining professional experience, academic credit, and income.

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
Geog 100, 101 Physical Geography & Lab	4
Geog 165 Human Geography	3
Geog 180-181-182 Spatial Graphics	3
Geog 250 World Regional Geography or 362 U.S. & Canada or 364 Idaho & Pacific Northwest	3
Geog 315 Geomorphology	3
Geog 370 Spatial Analysis	3
Geog 380 Cartography & Graphic Communication	4
Geog 470 Computer Mapping	3
Geog 475 Geographic Information Systems	3
Geog 478 Interactive Carto-graphics	3
Geog 480 Advanced Cartography & Remote Sensing	3
Geog 485 Cartographic Production Techniques	3
Geog 497 Practicum	3-6
CE 211 Engineering Measurements	4
CE 319 Photogrammetry & Photo Interpretation	3
CS 105 FORTRAN Programming for Engineers	2
Engr 101 Engineering Graphics	2
Eng 313 Business Writing or 317 Technical & Engr Report Writing	3
For 275 Aerial Photo Interp or 472 Remote Sensing of Environment	2-3
Math 140 Pre-calculus Algebra & Analytic Geometry	3
Math 160 Survey of Calculus or 180 Analytic Geometry & Calculus I	4
Psych 218 Introduction to Research in the Behavioral Science	4
Stat 251 Principles of Statistics	3
Adviser-approved electives	5

Department of Geology and Geological Engineering

Rolland R. Reid, Dept. Head (211 Mines Bldg.). Faculty: John H. Bush, Jr., Valerie E. Chamberlain, Dennis J. Geist, Mickey E. Gunter, William B. Hall, James H. Hardcastle, Terry R. Howard, Peter E. Isaacson, Maynard M. Miller, Stanley M. Miller, James Osiensky, Beth A. Palmer, Dale R. Ralston, Rolland R. Reid, Peter L. Siems, Kenneth F. Sprenke, Roy E. Williams. Adjunct Faculty: Earl H. Bennett II, Bill Bonnichsen, Roy M. Breckenridge, Charles R. Knowles, Roger C. Stewart.

Geology is the study of the origin and evolution of the earth, utilizing the principles of chemistry, physics, and biology and the unifying concepts of geologic time and uniformitarianism. The applied aspects of geology include the search for ores, industrial minerals, petroleum, coal, water, and other useful geologic materials. Geological engineering is the application of engineering principles to geologic problems. Hydrology is concerned with water: surface water, underground water, and water in the atmosphere. Generally involved are geologic aspects of mined land reclamation, waste disposal, and pollution abatement. Geophysics is the scientific study of the earth using the methods of physics.

Bachelor's degrees are offered in geology and in geological engineering. Both programs emphasize field and applied aspects along with theoretical considerations. Both programs require effective use of English in written and oral reports. It is the goal of the department that our graduates not only be ready for immediate employment, but also that they have the broad education that will help them to grow professionally and advance through positions of greater responsibility during their careers.

The geology program provides the student with the necessary background courses in basic sciences and mathematics plus a spectrum of courses in the subdisciplines of geology, including mineralogy, petrology, paleontology, stratigraphy, structural geology, geomorphology, geochemistry, and geophysics. A well-rounded education is obtained through additional courses in the humanities and social sciences. Specialized elective courses can be chosen to prepare for various careers such as exploration for minerals or for petroleum; or in dealing with geological problems related to engineering; or in the search for, and management of, ground water; or for preparation for advanced studies in graduate school.

The geological engineering program provides a broad background in the engineering sciences plus specialized courses that integrate engineering concepts and applications with the principles of geology. Humanities and social science courses provide a background in the liberal arts. Groups of elective courses may be taken to prepare for specialization in geotechnical engineering, geophysical engineering, or mineral exploration.

A minor in geology is offered for students in allied fields who have an interest in geology. The minor curriculum can be tailored to meet the needs of individual students.

Laboratories are maintained for work in all of the basic courses, with large study collections of fossils, rocks, minerals, crystal models, ore suites, thin sections, polished sections, and topographic and geologic maps.

Equipment used in advanced courses includes rock sawing and polishing facilities, binocular microscopes, reflection and polarizing microscopes, photomicrographic apparatus, x-ray diffraction and fluorescence equipment, and an atomic absorption spectrophotometer. The electron microprobe of the Idaho Geological Survey is available to advanced students. Also available are several computers, resistivity survey equipment, seismographs, magnetometer, soil drilling and sampling kits, water-level recorders, and various types of soil and rock strength-testing equipment.

Research laboratories are equipped for work in applied geochemistry, geophysics, petrology, economic geology, paleontology, photogeologic analysis, remote sensing, engineering geology, and geomechanics. Facilities for research in hydrology are also available in other divisions of the university.

Through the Glaciological and Arctic Sciences Institute, cooperative facilities for field training and research in British Columbia and Alaska are available in the disciplines of mining and exploration geology, geophysics, terrestrial photogrammetry, geomorphology, and glaciology.

The department offers Master of Science degrees in geology, geophysics, hydrology, and geological engineering. Theses are required in the first two programs (i.e., geology and geophysics), while a thesis/nonthesis option is available in the latter two programs (i.e., geological engineering and hydrology). A nonthesis program is also available in the Master of Arts in Teaching (major in earth science). The Doctor of Philosophy is offered in geology.

The undergraduate preparation expected of the entering candidates depends upon the degree sought. Candidates who do not have adequate preparation are admitted with the requirement that deficiencies be made up. Some of our most promising graduate students have come to us with bachelor's degrees in the humanities or social sciences. Deficiencies for master's candidates are determined by the major professor. The master's degrees in hydrology and geophysics are interdisciplinary and candidates are accepted from various fields of science and engineering; mathematics through Math 310 is required and other deficiencies will be determined by the major professor. There are no special requirements as to deficiencies of candidates for the Master of Arts in Teaching. Candidates for the Doctor of Philosophy in geology are expected to have earned a master's degree in geology.

BSU-ISU Cooperative Programs. The department participates in cooperative programs with the Earth Science Departments at Boise State University and at Idaho State University. Students interested in pursuing bachelor's degrees in geology or geophysics at those institutions may take transferable preparatory courses at UI. The master's degree in geophysics at UI is fully cooperative and students may take courses or perform research at any of the three institutions.

Courses

GEOLOGICAL ENGINEERING

GeolE **200** (s) **Seminar** (cr arr). Prereq: perm.

GeolE **203** (s) **Workshop** (cr arr). Prereq: perm.

GeolE **204** (s) **Special Topics** (cr arr).

GeolE **299** (s) **Directed Study** (cr arr). Prereq: perm.

GeolE **301 Field Geology and Report Writing** (6 cr). See Geol 301.

GeolE **400** (s) **Seminar** (cr arr). Prereq: perm.

GeolE **403** (s) **Workshop** (cr arr). Prereq: perm.

GeolE **404** (s) **Special Topics** (cr arr).

GeolE **407 Rock Mechanics** (3 cr). See Min 401.

GeolE **409 Ground Water** (3 cr). See Geol 409.

GeolE **410 Techniques of Ground Water Study** (3 cr). Same as Geol 410. Collection and analysis of field data for reconnaissance ground water studies.

GeolE **ID-J428/J528 Geostatistics** (3 cr). GeolE 428 same as Stat 428; GeolE J428/J528 same as Min J428/J528. WSU Geol and Stat 428. Applications of random variables and probability in geologic and engineering studies; regression, regionalized variables, spatial correlation, variograms, kriging, and simulation. Term project reqd for grad cr. Prereq: Stat 301 or equiv.

GeolE **J430/J530 Site Testing and Evaluation** (3 cr). Geotechnical site investigation methods; data acquisition, analysis, and interpretation of geologic conditions; application of expert systems and decision analysis to site evaluation; design considerations. Term project reqd for grad cr. One 1-day field trip. Prereq: Geol 101, ES 340.

GeolE **ID&WS435 Geological Engineering Principles** (3 cr). WSU C E 426/526. Application of geology to solution of engineering problems; emphasis on selection of rock and soil parameters for use in design analysis. Two lec and one 2-hr lab a wk. Prereq: Geol 101-102 and Phys 113.

GeolE **436 Geological Engineering Design** (3 cr). Application of engineering and geological principles to analysis and design in construction industries. One 1-day field trip. Prereq: GeolE 435.

GeolE **475 Mineral Deposits** (4 cr). Occurrence, classification, and origin of metallic and nonmetallic economic mineral deposits. Three lec and one 3-hr lab a wk; one 3-day field trip. Prereq: Geol 250, 345; recommended prep: Geol 386.

GeolE **476 Design of Exploration Programs** (3 cr). Same as Geol 476. Design of geological surveys and mineral exploration programs; integration and evaluation of geological, geochemical, and geophysical exploration techniques. Prereq or coreq: GeolE 475.

GeolE **485 Geochemical Exploration** (3 cr). See Geol 485.

GeolE **490 Mineral Resource Wastes and Mine Hydrology** (3 cr). See Geol 490.

GeolE **491 Waste Management** (3 cr). See Geol 491.

GeolE **498 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm of dept.

GeolE **499** (s) **Directed Study** (cr arr). Prereq: perm.

GeolE **500 Master's Research and Thesis** (cr arr).

GeolE **501** (s) **Seminar** (cr arr). Prereq: perm.

GeolE **502** (s) **Directed Study** (cr arr). Prereq: perm.

GeolE **503** (s) **Workshop** (cr arr). Prereq: perm.

GeolE **507 Rock Mechanics II** (3 cr). See Min 504.

GeolE **WS524 Geophysical Engineering** (4 cr). WSU Geol 405/505.

GeolE **528 Geostatistics** (3 cr). See GeolE J428/J528.

GeolE **530 Site Testing and Evaluation** (3 cr). See GeolE J430/J530.

GeolE **ID535 Seepage and Earth Dams** (3 cr). Same as CE 563. WSU C E 507. Principles of earth-dam design, failures, practical considerations in construction; principles governing the flow of water through soils. Prereq: perm.

GeolE **536 Slope Stability Analysis** (3 cr). Theory of stability analysis of slopes, landslides, and embankments for soil and rock masses; problem solutions using hand calculations and the latest computer codes; problems explore practical applications in the geotechnical engineering field.

GeolE **537 Advanced Topics in Geotechnical Engineering** (3 cr). Alt/yrs. Selected topics in geotechnical engineering; emphasis on recent developments. Prereq: perm.

GeolE **540 Stochastic Geotechnology** (3 cr). Probabilistic methods applied to geotechnology with emphasis on engineering, environmental geology, and hydrogeology. Prereq: GeolE J428/J528 or Stat 451.

GeolE **563 Hydrogeology** (3 cr). See Hydro 563.

GeolE **589 Water Resources Seminar** (1 cr). See Inter 589.

GeolE **597** (s) **Practicum** (cr arr). Prereq: perm.

GeolE **598** (s) **Internship** (cr arr). Prereq: perm.

GeolE **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

GEOLOGY

Geol **101 Physical Geology** (3 cr). Satisfies core requirement J-3-b. The earth, its composition, structure, and natural processes. Concurrent enrollment in Geol 102 recommended. One 1-day field trip.

Geol **102 Physical Geology Lab** (1 cr). Satisfies core requirement J-3-b. Lab study relevant to Geol 101. Coreq: Geol 101.

Geol **106 Historical Geology** (3 cr). Satisfies core requirement J-3-b. Evolution of the physical earth, plants, and animals; techniques used in interpretation of geologic history. Concurrent enrollment in Geol 107 recommended. One 1-day field trip.

Geol **107 Historical Geology Lab** (1 cr). Satisfies core requirement J-3-b. Lab study relevant to Geol 106. Coreq: Geol 106.

Geol **200** (s) **Seminar** (cr arr). Prereq: perm.

Geol **203** (s) **Workshop** (cr arr). Prereq: perm.

Geol **204** (s) **Special Topics** (cr arr).

Geol **212 Principles of Paleontology** (4 cr). Studies of morphology, classification of fossil groups, and utility of fossils in interpreting depositional environments and ages of sedimentary rocks. Three lec and one 2-hr lab a wk; one 1- to 2-day field trip. Prereq: Geol 106.

Geol **250 Mineralogy** (4 cr). Principles of crystallography, crystal chemistry, and crystal structures; mineral identification and classification. Two lec and two 2-hr labs a wk; one 1-day field trip. Prereq: one semester high-school trigonometry or Math 179, Geol 101, 102, Chem 111 or equivalent recommended.

Geol **251 Optical Mineralogy and Petrography** (3 cr). Principles of optical mineralogy; identification of minerals and rocks in hand specimen and with the petrographic microscope. One lec and two 2-hr labs a wk; two 1-day field trips. Prereq: Geol 250.

Geol **260 Survey of Minerals** (2 cr). Not open to geology majors. Survey of classification, crystallography, and uses of minerals. One lec and one 2-hr lab a wk; one 1-day field trip.

Geol **261 Survey of Rocks** (2 cr). Not open to geology majors. Survey of origin, classification, and uses of rocks. One lec and one 2-hr lab a wk; two 1-day field trips. Prereq: Geol 101, 102.

Geol **299** (s) **Directed Study** (cr arr). Prereq: perm.

Geol **301 Field Geology and Report Writing** (6 cr). Same as GeolE 301. Field problems and methods; use of instruments; interpretation of field data; preparation of reports based on field observations and interpretations. Three field trips. Accident and health insurance reqd. Prereq: Geol 345 or perm.

Geol **323 Geology of Idaho and the Pacific Northwest** (3 cr). Development of geologic structures and present-day distribution of rocks and mineral deposits in Idaho and the Pacific Northwest. Two 1-day field trips. Prereq: Geol 101 or Geog 100.

Geol **335 Geomorphology** (3 cr). Same as Geog 315. Classification, recognition, origin, and significance of land forms; land form analysis in interpretation of geologic structure and history. One 2-day field trip. Prereq: Geol 101-102 or 106-107 or Geog 100-101 or perm.

Geol **336 Processes in Glacial and Periglacial Environments** (3-6 cr). Same as Geog 316. Quantitative treatment using examples from regions of existing glaciers and permafrost. Two lec and one 3-hr lab a wk or (for 6 cr) 6-wk intensive field session in Alaska and Canada.

Geol **344 Geologic Spatial Methods** (1 cr). Analysis of plan sections and cross sections in geologic problems.

Geol **345 Structural Geology** (3 cr). Deformed rocks; mechanics of failure, recognition, description, classification, and genesis of folded and fractured rocks. Two lec and one 2-hr lab a wk; one 2-day field trip. Prereq: one semester high-school trigonometry or Math 179, Geol 101, 102, and 344.

Geol **360 Geologic Hazards** (3 cr). Survey of major geologically based natural hazards, their controlling factors, recognition of hazard potential, and evaluation of potential for possible reduction or elimination of risks; emphasis on flash floods, earthquakes, landslides, seasonal floods, subsidence. Prereq: Geol 101.

Geol **361 Geology and the Environment** (3 cr). Environmental consequences of development of geologic resources; geochemistry of pollution due to geologic resource use; geology and geochemistry of waste disposal sites. Prereq: Geol 101, 102.

Geol **375 Geology of National Parks** (2 cr). Primarily for non-geology majors who want to acquire a better knowledge of geologic concepts and processes through study of geology of national parks. Recommended preparation: Geol 101 or 106 or Geog 100.

Geol **386 Principles of Geochemistry** (3 cr). Physiochemical principles applied to geologic processes; phase equilibria in rock systems. Two lec and one 2-hr lab a wk. Prereq: Geol 250 or perm and Chem 111.

Geol **400** (s) **Seminar** (cr arr). Prereq: perm.

Geol **405 Earth Science** (4 cr). For earth science teaching majors and minors. Earth and its place in the solar system, processes responsible for changes. Three lec and one 2-hr lab a wk; two 1-day field trips. Prereq: Geol 101, 102, or Geog 100-101, or equivalent.

Geol **409 Ground Water** (3 cr). Same as GeolE 409. Occurrence, movement, and properties of subsurface water; intro to ground-water geology and hydrology. Two lec and one 2-hr lab a wk; one 1-day field trip. Prereq: Geol 101, 102, and Math 111 or 140.

Geol **410 Techniques of Ground Water Study** (3 cr). See GeolE 410.

Geol **J412/J512 Computer Geology** (2 cr). Computer applications in geology; use of BASIC programs, computer graphics, spreadsheets, and data bases to help solve geological problems. Term project reqd for grad cr. One lec and one 2-hr lab a wk. Prereq: CS 100 or equiv.

Geol **417 Advanced Paleontology** (3 cr). Fossil assemblage analyses and report writing; marine faunal assemblage 1st half semester; nonmarine floral assemblage 2nd half semester. Three 2-hr labs a wk; one 1-day field trip. Prereq: Geol 212 or perm.

Geol **J419/J519 World Regional Geology and Tectonics** (3 cr). Examination of stratigraphy, orogenic episodes, and tectonics of selected areas around the world. Additional projects/assignments reqd for grad cr.

Geol **424 Sedimentary Petrography Lab** (1 cr). Megascopic and microscopic petrography of sedimentary rocks. One 2-hr lab a wk. Prereq: Geol 250, 251; coreq: Geol 425.

Geol **425 Sedimentology** (3 cr). Environments and processes responsible for separation of clastic and nonclastic sedimentary rock materials; roles of transportation, deposition, including situation and lithification. Two lec and one 2-hr lab a wk; one 2-day field trip. Prereq: Geol 250.

Geol **426 Stratigraphy** (3 cr). Description, classification, distribution, and correlation of layered rocks; significance of stratigraphic analysis and geologic history. Two lec and one 2-hr lab a wk; one 4-day field trip. Prereq: Geol 425.

Geol **ID-J432/J532 Geologic Development of North America** (3 cr). WSU Geol 529. Tectonic, magmatic, and sedimentary sequence studies of North American continent through time; concepts of metal and petroleum enrichment related to time and geological processes. Additional questions on two exams and written report of field trip reqd for grad cr. One 7-day field trip. Coreq: Geol 426.

Geol **449 Geology of Industrial Rocks and Minerals** (2 cr). Classification, occurrence, origin, preparation, extraction, use, and economics of chiefly nonmetallic rocks and minerals of major importance to industry. Prereq: Geol 250.

Geol **451 Practicum in X-ray Diffraction** (1 cr). Use of x-ray diffraction in identification of minerals; x-ray safety training reqd. Accelerated course; enrollment limited to 8. Graded P/F. Minimum of 20 hrs of practical experience. Prereq: Geol 250 and perm.

Geol **466 Igneous and Metamorphic Rocks** (4 cr). Petrology plus megascopic and microscopic petrography of igneous and metamorphic rocks. Two lec and two 2-hr labs a wk; two 1-day or one 2-day field trips. Prereq: Geol 250, 251, and Geol 386 or Chem 112 or Chem 114.

Geol **472 Mineral Industry Case Studies** (3 cr). See Min 472.

Geol **476 Design of Exploration Programs** (3 cr). See GeolE 476.

Geol **J480/J580 Geologic Interpretations** (3 cr). Layout, construction, and interpretation of geologic maps and cross-sections; cross-section sets, outcrop projection onto topographic base; stereonet and 3-point appl; theory of error location; stereo airphoto tech. Additional projects/assignments reqd for grad cr. Prereq: Geol 345.

Geol **J484/J584 Advanced Geochemistry** (3 cr). Alt/yrs. Major and trace elements geochemistry of igneous, metamorphic, and sedimentary rocks. Cr earned in Geol 584 by completion of term project. Two lec and one 3-hr lab a wk. Prereq: Geol 386, 466.

Geol **ID485 Geochemical Exploration** (3 cr). Same as GeolE 485. WSU Geol 585. Prin of geochemical tech in prospecting for mineral deposits; design, execution, and interpretation of geochemical surveys. Two lec and one 3-hr lab a wk; two 1-day field trips. Prereq: Geol 386, Chem 112.

Geol **J488/J588 Isotope Geology** (3 cr). Alt/yrs. Geologically useful radioactive isotopes; geochronology and isotopes as tracers. Cr earned in Geol 588 by completion of term project. Two lec and one 3-hr lab a wk. Prereq: perm.

Geol **490 Mineral Resource Wastes and Mine Hydrology** (3 cr). Same as GeolE 490. Treatment of mineral resource waste production and management; interaction of wastes and water after disposal in the environment under existing legal constraints.

Geol **491 Waste Management** (3 cr). Same as GeolE and Hydro 491. Technological aspects of implementing regulations that govern the disposal of earth resource wastes under federal and state laws.

Geol **498 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm of dept.

Geol **499** (s) **Directed Study** (cr arr). Prereq: perm.

Geol **500 Master's Research and Thesis** (cr arr).

Geol **501** (s) **Seminar** (cr arr). Prereq: perm.

Geol **502** (s) **Directed Study** (cr arr). Prereq: perm.

Geol **503** (s) **Workshop** (cr arr). Prereq: perm.

Geol **WS511 Advanced Topics in Paleontology** (3 cr). WSU Geol 511.

Geol **512 Computer Geology** (2 cr). See Geol J412/J512.

Geol **ID515 Paleoecology** (3 cr). WSU Geol 515. Alt/yrs. Past environments; interrelation of physical and biological factors; changes in the physical environments of the past; their influence on distribution and evolution of organisms, including man.

Geol **ID516 Methods in Paleontology and Biostratigraphy** (3 cr). WSU Geol 516. Methods of collection, preparation, illustration of paleontologic data; principles of systematic paleontology; statistical-graphic presentation of biostratigraphic and paleontologic information. One lec and two 2-hr labs a wk; one 5-day field trip.

Geol **ID518 Biostratigraphy** (3 cr). WSU Geol 518. Techniques of correlation of sedimentary rock units and construction of relative time scale; concepts of evolution, extinction, biogeography, and animal assemblages through time. One 5-day field trip.

Geol **519 World Regional Geology and Tectonics** (3 cr). See Geol J419/J519.

Geol **WS520 Advanced Topics in Sedimentary Rocks** (3 cr). WSU Geol 520. Alt/yrs. Prereq: Geol 425, 426.

Geol **WS523 Advanced Topics in Stratigraphy** (3 cr). WSU Geol 523.

Geol **525A Stratigraphic Paleobotany** (3 cr). Alt/yrs. Fossil floras and floral successions, taxonomic problems; geologic ranges and past distributions of plant taxa; paleoecological interpretation; methods and correlation and dating by fossil plants. One 1-day and one 2-day field trips.

Geol **WS525B Carbonate Depositional Systems** (3 cr). WSU Geol 525.

Geol **ID526 Petrology of Carbonate Rocks** (3 cr). WSU Geol 528. Origin, classification, distribution, depositional environments, and diagenesis of modern and ancient carbonates; emphasis on petrographic analysis. Two lec and one 3-hr lab a wk; one 3-day field trip.

Geol **ID527 Petrology of Clastic Rocks** (3 cr). WSU Geol 527. Origin, classification, and diagenesis of terrigenous rocks; emphasis on petrographic analysis. Two lec and one 3-hr lab a wk; one 3-day field trip.

Geol **WS528 Clastic Depositional Systems** (3 cr). WSU Geol 521.

Geol **532 Geologic Development of North America** (3 cr). See Geol J432/J532.

Geol **536 Advanced Field Glaciology** (6 cr). Same as Geog 516. Advanced quantitative treatment of glaciological problems carried out on selected glaciers of the Juneau Icefield, Alaska, or an alternative area in the Rocky Mountains or Cascades. Intensive 7-wk summer field session.

Geol **WS541 Structural Analysis** (3 cr). WSU Geol 541. Alt/yrs.

Geol **WS548 Tectonics** (3 cr). WSU Geol 540. Alt/yrs.

Geol **WS550 Advanced Mineralogy** (3 cr). WSU Geol 550. Alt/yrs.

Geol **WS551 Ore Microscopy and Fluid Inclusion Analysis** (3 cr). WSU Geol 551. Alt/yrs.

Geol **WS552 X-ray Analysis in Geology** (3 cr). WSU Geol 552.

Geol **WS560 Advanced Igneous Petrology** (3 cr). WSU Geol 560.

Geol **WS563 Igneous Petrogenesis** (3 cr). WSU Geol 563.

Geol **ID565 Metamorphism** (3 cr). WSU Geol 565. Metamorphic minerals, rocks, processes, and facies; polymetamorphic rocks; recent developments in structural geometry. Two lec and one 3-hr lab a wk; one 2-day field trip. Prereq: Geol 251.

Geol **566 Volcanic Geology** (3 cr). Eruption mechanisms, volcanic processes and landforms, and volcanic deposits. Two lec and one 2-hr lab a wk; one 5-day and one 1-day field trips.

Geol **567 Igneous Petrogenesis** (3 cr). Advanced topics in igneous petrology, emphasizing the physics and chemistry of magmas, especially orogenic rocks and oceanic basalts. Two 1-1/2 hr lec a wk; one 4-day field trip. Prereq: Geol 466.

Geol **WS571 Geochemistry of Hydrothermal Ore Deposits** (3 cr). WSU Geol 571.

Geol **WS573 Advanced Topics in Economic Geology** (2 cr). WSU Geol 573. Alt/yrs.

Geol **ID575 Advanced Mineral Deposits I** (3 cr). WSU Geol 561. Ore mineralogy and fabric; sulfide phase equilibria.

Geol **576 Advanced Mineral Deposits I Lab** (1 cr). Identification of ore minerals; their textures, association, and paragenesis. One 3-hr lab a wk.

Geol **577 Advanced Mineral Deposits II** (3 cr). Modern concepts of the origin and geochemistry of metallic mineral deposits. Two lec and one 3-hr lab a wk; one 3-day field trip.

Geol **580 Geologic Interpretations** (3 cr). See Geol J480/J580.

Geol **WS581 Petrologic Phase Diagrams** (3 cr). WSU Geol 581.

Geol **WS583 Introductory Geochemistry** (3 cr). WSU Geol 480. Alt/yrs.

Geol **584 Advanced Geochemistry** (3 cr). See Geol J484/J584.

Geol **ID586 Advanced Geochemical Exploration** (3 cr). WSU Geol 586. Theory and use of colorimetric and instrumental analytical methods in mineral exploration; primary and secondary dispersion patterns; endogenetic and exogenetic behavior of individual elements. Two lec and one 3-hr lab a wk. Prereq: Geol 485.

Geol **587 Instrumental Techniques in Geochemistry** (3 cr). Modern instrumentation, including x-ray fluorescence, gas chromatography, electron microprobe, atomic absorption, infrared and Mossbauer spectrometry applied to geochemical problems. Two lec and one 3-hr lab a wk. Prereq: perm.

Geol **588 Isotope Geology** (3 cr). See Geol J488/J588.

Geol **589 Water Resources Seminar** (1 cr). See Inter 589.

Geol **ID590 Photogeology** (3 cr). WSU Geol 590. Manipulation and analysis of air photos for geologic information; photogrammetry; map preparation and interpretation of stereo vertical and oblique air photos, some in color. One lec and two 3-hr labs a wk. Prereq: Geol 335, 345, or perm.

Geol **WS592 Interdisciplinary Research Topics in Geology** (3 cr, max 6). WSU Geol 592.

Geol **596 Advanced Photogeology** (3 cr). New research techniques; use of special photographic and remote sensor imagery, such as color, infrared color, and multispectral scanner imagery, including satellite photos. One lec and two 3-hr labs a wk. Prereq: Geol 590 or perm.

Geol **597** (s) **Practicum** (cr arr). Prereq: perm.

Geol **598** (s) **Internship** (cr arr). Prereq: perm.

Geol **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Geol **600 Doctoral Research and Dissertation** (cr arr).

GEOPHYSICS

Geoph **J420/J520 Exploration Geophysics** (3 cr). Design and interpretation of geophysical surveys for exploration of metallic and nonmetallic mineral deposits; use of geophysics to solve exploration problems. Additional projects/assignments reqd for grad cr. Prereq: perm.

Geoph **421 Engineering Geophysics** (3 cr). See Min 421.

Geoph **422 Principles of General Geophysics** (3 cr). Same as Min 422. Outline of geophysical methods used to investigate earth's interior. One 1-day field trip. Prereq: perm.

Geoph **J423/J523 Seismic Stratigraphy** (3 cr). Intro to seismic exploration with emphasis on stratigraphic interpretation; solution of geologic problems using seismic techniques; design of seismic surveys. Additional projects/assignments reqd for grad cr. Prereq: perm.

Geoph **499** (s) **Directed Study** (cr arr). Prereq: perm.

Geoph **500 Master's Research and Thesis** (cr arr).

Geoph **501** (s) **Seminar** (cr arr). Prereq: perm.

Geoph **502** (s) **Directed Study** (cr arr). Prereq: perm.

Geoph **520 Exploration Geophysics** (3 cr). See Geoph J420/J520.

Geoph **521 Mining Geophysics** (3 cr). See Min 520.

Geoph **523 Seismic Stratigraphy** (3 cr). See Geoph J423/J523.

HYDROLOGY

Hydro **491 Waste Management** (3 cr). See Geol 491.

Hydro **500 Master's Research and Thesis** (cr arr).

Hydro **501** (s) **Seminar** (cr arr). Graded P/F. Prereq: perm.

Hydro **502** (s) **Directed Study** (cr arr). Prereq: perm.

Hydro **503** (s) **Workshop** (cr arr). Prereq: perm.

Hydro **563 Hydrogeology** (3 cr). Same as GeolE 563. Equations governing single fluid flow through saturated porous media under various geologic conditions; models, general relations between flow systems and water quality, and between surface and ground water. Prereq: Geol 409, Math 200, or perm.

Hydro **ID&WS566 Geochemistry of Ground Water** (3 cr). WSU C E and Geol 579. Nature and origin of dissolved constituents in ground water; modification of ground water quality through mineral processes and by human activities. Two lec and one 2-hr lab a wk. Prereq: Geol 409 or perm.

Hydro **568 Advanced Hydrogeology** (3 cr). Analysis of problems that have confronted the geohydrologist since the inception of quantitative methods. Prereq: Hydro 563.

Hydro **569 Contaminant Hydrogeology** (3 cr). Characteristics of contaminant migration in ground water systems including analysis of field problems. Prereq: Hydro 566.

Hydro **ID572 Ground Water Management** (3 cr). WSU C E 578. Hydrologic, economic, and legal factors controlling development and management of ground water resources.

Hydro **ID575 Design and Construction of Water Wells** (3 cr). WSU C E 506. Analysis of geologic and engineering factors important in design, construction, operations, and maintenance of water wells.

Hydro **577 Computer Applications in Geohydrology** (3 cr). Numerical modeling of groundwater systems with particular emphasis on finite difference methods. Prereq: Geol 409, CS 105, or perm.

Hydro **579 Hazardous Waste Site Remediation** (3 cr). See ChE 579.

Hydro **597** (s) **Practicum** (cr arr). Prereq: perm.

Hydro **598** (s) **Internship** (cr arr). Prereq: perm.

Hydro **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Curricular Requirements

GEOLOGY (B.S.Geol.)

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
Geol 101, 102 Physical Geology & Lab	4
Geol 106, 107 Historical Geology & Lab	4
Geol 200 Seminar	1
Geol 250 Mineralogy	4
Geol 251 Optical Mineralogy & Petrography	3
Geol 301 Field Geology & Report Writing	6
Geol 344 Geologic Spatial Methods	1
Geol 345 Structural Geology	3
Geol 386 Prin of Geochemistry or Chem 112 Inorganic Chemistry & Qualitative Analysis or Chem 114 General Chemistry	3-5
Geol 424 Sedimentary Petrography Lab	1
Geol 425 Sedimentology	3
Geol 466 Igneous & Metamorphic Rocks	4
Geol 480 Geologic Interpretations	3
Two of the following courses	6-7
Geol 212 Principles of Paleontology	
Geol 335 Geomorphology	
Geol 426 Stratigraphy	
Biol 201 Introduction to the Life Sciences	4
Chem 111 Principles of Chemistry	4
Eng 317 Technical & Engineering Report Writing	3
Geoph 422 Prin of Geophysics or Phys 114, 116 General Physics & Lab	3-4
Math 160 Survey of Calculus or 180 Analytic Geometry & Calculus	4
Phys 113, 115 General Physics & Lab	4
Stat 251 Principles of Statistics	3

And the completion of one course in computer programming, one of the areas of emphasis below, and approved electives to total 128 credits for the degree.

A. GENERAL GEOLOGY EMPHASIS

Twenty-seven additional credits with adviser's approval beyond the required courses, selected from engineering, biology, chemistry, math, physics, or upper-division courses in the College of Mines and Earth Resources.

B. ACADEMIC MINOR EMPHASIS

Completed requirements for any academic minor approved by the department, plus electives approved by adviser to total 27 credits. The list of approved minors is available from the departmental office.

C. ENVIRONMENTAL GEOLOGY EMPHASIS

Course	Credits
Geol 335 Geomorphology	3
Geol 360 Geologic Hazards or GeolE 435 Geol Engr Principles	3
Geol 386 Principles of Geochemistry	3
Geol 409 Ground Water	3
Geol 410 Techniques of Ground Water Study	3
Geol 490 Mineral Resource Wastes & Mine Hydrology or 491 Waste Management	3
Chem 112 Inorganic Chemistry & Qualitative Analysis or 114 General Chemistry	4-5
Approved electives from geol, geog, min, soils, forestry, CE, biol, or chem (approved list is available in dept office)	9

D. MINERAL EXPLORATION GEOLOGY EMPHASIS

Course	Credits
Geol 386 Principles of Geochemistry	3
Geol 426 Stratigraphy	3
Geol 476 Design of Exploration Programs	3
Geol 485 Geochemical Exploration	3
Chem 112 Inorganic Chemistry & Qualitative Analysis or 114 General Chemistry	4-5
GeolE 475 Mineral Deposits	4
Geoph 420 Exploration Geophysics	3
Electives chosen from the following	3
Geol 432 Geological Development of North America	
CE 218 Elementary Surveying	
Geog 425 Mineral Land Management	
GeolE 428 Geostatistics	
Min 350 Mineral Economics	

GEOLOGICAL ENGINEERING (B.S.GeoI.E.)

As part of a cooperative program with Oregon State University, Oregon resident students may enroll in this program and will not be charged out-of-state tuition by UI.

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
GeolE 200 Seminar	1
GeolE 301 Field Geology & Report Writing	6
GeolE 428 Geostatistics	3
GeolE 435 Geological Engineering Principles	3
Geol 101, 102 Physical Geology & Lab	4
Geol 260 Survey of Minerals	2
Geol 261 Survey of Rocks	2
Geol 335 Geomorphology	3
Geol 345 Structural Geology	3
Geol 425 Sedimentology	3
Chem 111, 114 Principles of Chem & General Chem	8
CE 211 Engineering Measurements	3
CS 105 FORTRAN Programming for Engineers	2
ES 210 Engineering Statics	3
ES 220 Engineering Dynamics	3
ES 320 Fluid Mechanics	3
ES 321 Thermodynamics & Heat Transfer	3
ES 340 Mechanics of Materials	3
Eng 317 Technical & Engineering Report Writing	3
Math 180, 190, 200 Analytic Geometry & Calculus	11
Math 310 Ordinary Differential Equations	3
Min 352 Project Investment Analysis & Management	3
Min 401 Rock Mechanics	3
Phys 210-211-212-213 Engineering Physics & Lab	8
Stat 301 Probability & Statistics	3
Humanities and social sciences electives	16

And one of the following areas of emphasis:

Geotechnical Engineering Emphasis

GeolE 409 Ground Water	3
GeolE 410 Tech of Ground Water Study or CE 321 Hydrology	3
GeolE 436 Geological Engineering Design	3
Geoph 421 Engineering Geophysics	3
CE 460 Soil Mechanics	3
Approved technical electives	8

Geophysical Engineering Emphasis

GeolE 436 Geological Engineering Design	3
Geoph 421 Engineering Geophysics	3
EE 330 Electromagnetic Theory	4
ES 402 Applied Numerical Methods	3
Geophysics courses	6
Approved technical electives	4

Mineral Exploration Emphasis

GeolE 475 Mineral Deposits	4
GeolE 476 Design of Exploration Programs or 485 Geochemical Exploration	3
Geol 386 Principles of Geochemistry	3
Geol 466 Igneous & Metamorphic Rocks	4
Geoph 420 Exploration Geophysics	3
Min 450 Mine Planning I	3
Approved technical electives	3

The minimum number of credits for the degree is 134.

Academic Minor Requirements

GEOLOGY MINOR

Course	Credits
Geol 101, 102 Physical Geology & Lab	4
Geol 106, 107 Historical Geology & Lab	4
Geol 200 Seminar	1
Electives in geology, geophysics, or geological engineering	12

GEOPHYSICS—see Department of Geology and Geological Engineering

GERMAN—see Department of Foreign Languages and Literatures

GREEK—see Department of Foreign Languages and Literatures

Division of Health, Physical Education, Recreation and Dance

Calvin W. Lathen, Div. Director and Coordinator of Recreation (101 Phys. Ed. Bldg.). Faculty: Damon D. Burton, Jess D. Caudillo, Dennis Dolny (Coordinator, Sport Science), Charles H. Hammersley, Bonnie J. Hultstrand (Coordinator, Physical Education), James D. Karabetsos (Director, Campus Recreation), Glenn Kastrinos, Calvin

W. Lathen, Dwaine J. Marten (Coordinator, Health and Safety), Karyn R. Nelson, Randy M. Page, Sharon K. Stoll, Charles J. Thompson, Diane B. Walker (Director, Center for Dance).

The Division of Health, Physical Education, Recreation and Dance is one of three divisions and two departments in the College of Education. The division offers a Ph.D. in education with tracks in sport pedagogy and in physical education; master's degrees in recreation and physical education; baccalaureate degrees in dance, physical education, recreation, and sport science; several minors and options; basic instruction in numerous activities, and leisure activities through Campus Recreation.

The activity portion of the program is supported by outstanding facilities, which include three gymnasia, two dance studios, two pools, eight indoor tennis courts, eleven racquetball courts, indoor and outdoor tracks, weight rooms, fitness trail, and expansive field and play areas.

The baccalaureate degree in dance is designed to give the student professional training in teaching, performing, choreography, and concert production. The Festival Dance and Performing Arts Association maintains a residency program with the division.

The baccalaureate degree in physical education leads to elementary and secondary teaching certification and provides a foundation for athletic coaching. Physical education is concerned primarily with the art and science of human movement, principles and concepts relating to skill acquisition and analysis, the effects of exercise on the body, and concepts relating to total fitness.

The baccalaureate degree in recreation prepares the student for recreation leadership roles in municipalities, agencies, institutions, and private industry. Students enrolled in this program complete a summer recreation internship. Recreation students specialize by completing a university-approved academic minor.

The baccalaureate degree in sport science prepares students to work in the general areas of sport, and corporate, clinical, or private wellness programming. It is for students interested in professional opportunities that do not require teacher certification. A summer internship at a corporate, clinical, or sport facility is included.

Academic and teaching minors offered by the division include: health education, health and driver education, dance, recreation, therapeutic recreation, outdoor recreation leadership, tourism and leisure enterprises, elementary physical education, secondary physical education, fitness/wellness, coaching, and athletic training.

Master's degree tracks include sport or dance pedagogy, sport science, and sport psychology in physical education and sport and recreation management in recreation. A 2.8 undergraduate grade-point average is required for admission. Doctoral admission requirements can be obtained from the College of Education.

Courses

DANCE

Dan **105** (s) **Dance** (1 cr, max arr). Same as PE 105. Modern, folk, ballet, jazz, square, and social dancing. Two hrs a wk. Graded P/F.

Dan **112 Basic Dance Forms** (3 cr). Basic recreational and theatrical dance forms (folk, square, social, modern, jazz, ballet); basic teaching methods. Five hrs of lec-lab a wk. Prereq: perm.

Dan **113 Problems in Dance Composition** (1 cr, max 4). Various styles, choreography, movement quality, music, costuming, and staging. Two hrs a wk. Prereq: Dan 105 or perm.

Dan **200** (s) **Seminar** (cr arr). Prereq: perm.

Dan **203** (s) **Workshop** (cr arr). Prereq: perm.

Dan **204** (s) **Special Topics** (cr arr).

Dan **210 Dance Theatre** (1-2 cr, max 8). Open to all students. Stagecraft; dance styles including modern, jazz, ballet, tap. Two hrs of company class a wk plus additional rehearsals leading to performance. Prereq: dance experience.

Dan **220 Children's Dance** (2 cr). Alt/yrs. Methods and resource material for teaching recreational and creative dance to elementary school child and integrating dance into elementary school curriculum.

Dan **299** (s) **Directed Study** (cr arr). Prereq: perm.

Dan **320 Labanotation** (3 cr). Alt/yrs. Intro to methods of notating movement; notating and reading basic elements of motif writing and Labanotation.

Dan **321 Dance Pedagogy** (3 cr). Learning styles, teaching styles, and behaviors as they affect teaching and learning in dance; science of dance training.

Dan **325 Dance Production** (3 cr). Alt/yrs. Organization and production of dance concerts; program planning, marketing, management, costume design, staging the production.

Dan **383 Dance Composition** (1-2 cr, max 6). Improvisation and choreography using basic composition elements; advanced exploration of choreographic procedures and performance. Prereq: Dan 105 (modern I) and perm.

Dan **400** (s) **Seminar** (cr arr). Prereq: perm.

Dan **403** (s) **Workshop** (cr arr). Prereq: perm.

Dan **404** (s) **Special Topics** (cr arr).

Dan **410 Pre-professional Dance Theatre** (1-2 cr, max 8). Advanced work in choreography and performance. Two hrs of company class a wk plus additional rehearsals leading to performance. Prereq: Dan 210, 325, 383.

Dan **420 Dance Accompaniment** (3 cr). Recorded music, percussion, and electronic accompaniments used for contemporary dance. Prereq: perm.

Dan **421 Dance History** (3 cr). Development of theatrical, social, and educational dance from primitive to contemporary styles. Prereq: perm.

Dan **498 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

Dan **499** (s) **Directed Study** (cr arr). Prereq: perm.

HEALTH & SAFETY

H&S **150 Wellness Lifestyles** (3 cr). Health concepts and strategies that affect one's wellness; emphasis on personal responsibility and life-style choices.

H&S **200** (s) **Seminar** (cr arr). Prereq: perm.

H&S **203** (s) **Workshop** (cr arr). Prereq: perm.

H&S **204** (s) **Special Topics** (cr arr).

H&S **245 Introduction to Athletic Injuries** (3 cr). Special fee course. Athletic training; recognition, evaluation, general care of athletic injuries; adhesive strapping. Two lec and one lab a wk.

H&S **288 First Aid** (2 cr). Emergency care of injuries resulting from accidents or illness; advanced Red Cross first aid card given.

H&S **289 Drugs in Society** (2 cr). Legal implications, values, and physical, social, and emotional factors involved in the use and abuse of drugs in society.

H&S **299** (s) **Directed Study** (cr arr). Prereq: perm.

H&S **316 School Health Services** (2 cr). Elementary and secondary school health services, school health environment, and public, volunteer, health-related organizations.

H&S **323 Health Education Methods** (3 cr). Curriculum design, organization, strategies, and resource materials for teaching health education.

H&S **349 Advanced Athletic Injuries** (3 cr). Special fee course. Etiologic symptoms of sports-related injuries; diagnostic emphasis given to specific injuries of the extremities. Two lec and one lab a wk. Prereq: H&S 245 or perm.

H&S **350 Stress Management** (2 cr). Application of behavioral techniques in stress management; development of skills specific for self-help stress management.

H&S **355 Accident Control and Prevention** (2 cr). Alt/yrs. Accidents, accident prevention, and injury control in variety of settings within society.

H&S **400** (s) **Seminar** (cr arr). Prereq: perm.

H&S **403** (s) **Workshop** (cr arr). Prereq: perm.

H&S **404** (s) **Special Topics** (cr arr).

H&S **410 Athletic Rehabilitation and Administration** (2 cr). Rehabilitation techniques for reconditioning following specific injuries and surgeries; administrative topics include facilities, budgeting, and legalities.

H&S **J436/J536 Health and Wellness Promotion** (3 cr). Theoretical and programmatic aspects of health promotion/wellness programs in workplace and community; investigation of marketing, mass media, and health behavior change approaches; review of research on smoking cessation, weight control, nutrition, fitness, hypertension, and stress management programs. Additional projects reqd for grad cr.

H&S **440 Driver Education I** (3 cr). Methods, organization, and administrative techniques; development of habits, attitudes, knowledge, and skills. Prereq: valid driver's license and perm.

H&S **449 Driver Education II** (3 cr). Special fee course. Continuation of H&S 440. Advanced preparation in principles and practice of driver and traffic safety education for teachers, supervisors, and administrators; emphasis on new and broader teaching competencies in traffic safety. Lab work and safety projects reqd. In addition to lec, 6-10 hrs of practicum reqd during semester. Prereq: H&S 440, valid driver's license, satisfactory driving record, and perm.

H&S **J450/J550 Contemporary Issues in Health** (2 cr). Current trends and issues affecting individual's and society's decisions regarding personal and environmental health. Term project reqd for grad cr.

H&S **498 Practicum in Tutoring** (1 cr, max arr). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

H&S **499** (s) **Directed Study** (cr arr). Prereq: perm.

H&S **501** (s) **Seminar** (cr arr). Prereq: perm.

H&S **502** (s) **Directed Study** (cr arr). Prereq: perm.

H&S **503** (s) **Workshop** (cr arr). Prereq: perm.

H&S **504** (s) **Special Topics** (cr arr).

H&S **505** (s) **Professional Development** (cr arr). Cr earned in this course will not be accepted toward grad degree programs. Prereq: perm.

H&S **536 Health and Wellness Promotion** (3 cr). See H&S J436/J536.

H&S **550 Contemporary Issues in Health** (2 cr). See H&S J450/J550.

H&S **592 The School Health Program** (3 cr). For teachers and administrators. Well-balanced health program; organization and administration; health services, healthful school living, and health instruction.

PHYSICAL EDUCATION

ACTIVITY COURSES

Note: PE 105, 106, 107, and 108 may be repeated for cr if the student engages in a different activity or level of the same activity. Practical tests may be given at the beginning of the semester to determine the student's level of ability.

PE **105** (s) **Dance** (1 cr, max arr). See Dan 105.

PE **106** (s) **Individual and Dual Sports** (1 cr, max arr). Bowling, racket sports, fencing, golf, gymnastics, conditioning, backpacking, cycling, cross-country skiing, etc. Two days of field trips may be a part of the course requirements for such activities as backpacking, cycling, etc. Two hrs a wk. Graded P/F.

PE **107** (s) **Team Sports** (1 cr, max arr). Field sports, volleyball, basketball, and softball. Two hrs a wk. Graded P/F.

PE **108** (s) **Swimming** (1 cr, max arr). All levels of proficiency, including WSI, lifeguarding, diving, and scuba. Two hrs a wk. Graded P/F.

PROFESSIONAL COURSES

PE **112 Skill and Analysis: Archery and Bowling** (1 cr). Skill development and knowledge of teaching progressions, techniques, and analysis of skills and common errors in archery and bowling. Two lec-labs a wk.

PE **113 Skill and Analysis: Badminton** (1 cr). Skill development and knowledge of teaching progressions, techniques, and analysis of skills and common errors in badminton. Two lec-labs a wk.

PE **114 Skill and Analysis: Basketball** (1 cr). Skill development and knowledge of teaching progressions, techniques, and analysis of offensive and defensive skills and strategy in basketball. Two lec-labs a wk.

PE **115 Skill and Analysis: Golf** (1 cr). Skill development and knowledge of teaching progressions, techniques, and analysis of correction of the golf stroke and game. Two lec-labs a wk.

PE **116 Skill and Analysis: Soccer and Speedball** (1 cr). Skill development and knowledge of teaching progressions, techniques, and analysis of offensive and defensive skills and strategy in soccer and speedball. Two lec-labs a wk.

PE **117 Skill and Analysis: Tennis** (1 cr). Skill development and knowledge of teaching progressions, techniques, and analysis of skills and common errors in tennis. Two lec-labs a wk.

PE **118 Skill and Analysis: Track and Field** (1 cr). Skill development and knowledge of teaching progressions, techniques, analysis, and correction of skills in track and field. Two lec-labs a wk.

PE **119 Skill and Analysis: Volleyball** (1 cr). Skill development and knowledge of teaching progressions, techniques, and analysis of skills and strategy in volleyball. Two lec-labs a wk.

PE **120 Skill and Analysis: Wrestling** (1 cr). Skill analysis, skill development, and teaching techniques in wrestling. Two lec-labs a wk.

PE **122 Skill and Analysis: Softball** (1 cr). Skill development and knowledge of teaching progressions, techniques, and common errors in softball. One lec and 1 hr of lab a wk.

PE **123 Survey of Field Sports** (1 cr). Intro to variety of field sports and activities found in various school curricula. One lec and 1 hr of lab a wk.

PE **124 Survey of Outdoor Pursuits** (1 cr). Intro to fundamentals of outdoor activities, including how to incorporate them into a school curriculum. One lec and 1 hr of lab a wk.

PE **160 Foundations of Physical Education and Education** (3 cr). Education and physical education, sport, and fitness aims, objectives, overview of principles, historical development, including current trends and issues.

PE **200** (s) **Seminar** (cr arr). Prereq: perm.

PE **201 Fitness Activities and Concepts** (2 cr). Topics related to individual fitness development; focus on development of personal skills in presenting and teaching fitness activities for public and private sector programs. Two lec and 1 hr of lab a wk.

PE **202 Skill and Analysis: Tumbling and Gymnastics** (2 cr). Skill analysis, skill development, spotting, and teaching techniques in tumbling and gymnastics. Four lec-labs a wk.

PE **203** (s) **Workshop** (cr arr). Prereq: perm.

PE **204** (s) **Special Topics** (cr arr).

PE **240 Elementary School Physical Education** (3 cr). Current theory in curriculum and teaching methods with practical applications in lab and field experience. Four hrs of lec-lab a wk. Prereq: Dan 112.

PE **243 Recreation Activities** (2 cr). See Rec 243.

PE **244 Lifeguarding** (2 cr). Trains individuals to lifeguard at swimming pools and non-surf, open water beaches; Standard First Aid and CPR Certification reqd to receive Red Cross Lifeguarding Certification. One field trip. Prereq: intermediate swimming or perm.

PE **250 Elementary Physical and Health Education** (3 cr). Content, methods, and materials in elementary school physical education and health for classroom teachers. Four hrs of lec-lab a wk.

PE **260 Motor Learning** (3 cr). Various physical, psychological, and neurological factors as they influence the acquisition of motor skills. Four hrs of lec-lab a wk. Prereq: Zool 119 or perm.

PE **WS261 Human Anatomy** (3 cr). WSU PEP 262.

PE **266 Aquatic Instructor's Course** (2 cr). Methods. Students passing Red Cross standards will receive instructor's certificate. Three hrs a wk. Prereq: certificate in lifeguarding or emergency water safety and pass swimming skills pre-test.

PE **271 Interpretation of Physical Education, Health, and Recreation** (3 cr). Importance of these related fields to general education from the Greeks to the present day.

PE **J275/J475 Moral Reasoning in Sport** (2 cr). Current ethical issues in sport, such as performance-enhancing drugs, mechanization, cheating, eligibility; challenges students to creatively examine their beliefs. Additional projects/assignments reqd for cr in PE 475.

PE **299** (s) **Directed Study** (cr arr). Prereq: perm.

PE **300 Human Kinesiology** (2 cr). Anatomical and mech analysis of human movement in sport and exercise. Three hrs of lec-lab a wk. Prereq: Zool 119.

PE **305 Applied Sports Psychology** (3 cr). Overview of key psychological issues in physical education and sport including competition, personality, anxiety, motivation, self-confidence, imagery, and stress management; practical applications of psychological concepts of youth sports and development of key psychological skills for competition.

PE **310 Cultural and Philosophical Aspects of Sport** (2 cr). Analysis of philosophic and anthropological phenomenon in sport.

PE **320 Methods and Materials in Physical Education** (3 cr). Study and application of teaching methods and teaching behavior; structuring learning outcomes through performance objectives; lesson and unit planning. Prereq: PE 240, 260; coreq: PE 321.

PE **321 Physical Education Teaching Lab** (1 cr). Application of teaching styles and analysis of teaching behavior. Graded P/F.

PE **322 Teaching Individual Sports** (2 cr). Methods for majors and minors.

PE **323 Teaching Team Sports** (2 cr). Methods for majors and minors. Prereq: PE 322.

PE **380 Measurement and Evaluation** (3 cr). Evaluation and interpretation of tests used for physical performance evaluation; application of basic statistical procedures. Three hrs of lec-lab a wk.

PE **400** (s) **Seminar** (cr arr). Prereq: perm.

PE **403** (s) **Workshop** (cr arr). Prereq: perm.

PE **404** (s) **Special Topics** (cr arr).

PE **J405/J505 Professional Development** (cr arr). Cr earned may not be applied toward grad degree programs but may be accepted for fifth-yr certification. Professional development in physical education and sport professional personnel. Additional projects/assignments reqd for grad cr.

PE **418 Physiology of Exercise** (3 cr). Effects of physical activity on the circulatory, respiratory, and other systems. Two lec and one 2-hr lab a wk. Prereq: Zool 119.

PE **424 Physical Education for Special Populations** (3 cr). Adapting physical education programs to meet individual needs.

PE **431 Practicum: Student Teaching** (7 or 14 cr). Cr earned in this course may not be applied to total cr needed for a PE teaching major. Supervised student teaching at elementary and secondary levels. Double majors select the 7-cr option; all other students select 14 cr divided between elementary and secondary level. Graded P/F. Prereq: admission to teacher education, PE 240, 320, 321, Ed 312, 314, cumulative GPA of 2.5, and perm of dept. (Submit application to director of clinical experiences in the College of Education by December 1 of school year before enrolling.)

PE **440 Physical Education and Sport Management** (3 cr). Curriculum, programming, organization, and administration of school physical education and intramurals; field experience.

PE **450 Coaching Clinic** (1-2 cr, max 2). Alternate summers. Procedures and techniques in coaching high school and college sports. Consult the summer bulletin for information.

PE **WS466 Athletic Training Evaluation** (2 cr, max 4). WSU PEP 466.

PE **J467/J567 Physical Education and Recreation for the Severely Handicapped** (3 cr). See Rec 467.

PE **475 Moral Reasoning in Sport** (2 cr). See PE J275/J475.

PE **J493/ID-J593 Fitness Assessment and Prescription** (3 cr). WSU PEP 568. Development of skills in exercise testing, data interpretation, and prescription for health related fitness. Cr earned in PE 593 by completion of additional projects/assignments. Two lec and 2 hrs of lab a wk. Prereq: PE 418 or perm.

PE **495 Internship in Physical Education** (9 cr). Supervised field work. Graded P/F. Prereq: jr standing and Rec 445.

PE **497 Athletic Program Management** (3 cr). Scheduling, facilities, equipment, maintenance, budgeting, and public relations in the school.

PE **498 Practicum in Tutoring** (1 cr, max arr). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

PE **499** (s) **Directed Study** (cr arr). Prereq: perm.

PE **500 Master's Research and Thesis** (cr arr).

PE **501** (s) **Seminar** (cr arr). Prereq: perm.

PE **502** (s) **Directed Study** (cr arr). Prereq: perm.

PE **503** (s) **Workshop** (cr arr). Prereq: perm.

PE **504** (s) **Special Topics** (cr arr).

PE **505 Professional Development** (cr arr). See PE J405/J505.

PE **506 Foundations of Motor Skills** (3 cr). Application of psychological, kinesiological, and mechanical principles for an understanding of motor activity.

PE **518 Advanced Physiology of Exercise** (3 cr). Principles and methods essential to the experimental approach to physiological performance problems. Two lec and one lab a wk.

PE **519 Biomechanics of Sport** (3 cr). Quantitative study of human movement examining internal and external forces acting on the body and the resultant limitations to motor behavior.

PE **520 History of Physical Education and Sport** (3 cr). Cultural, philosophical, and comparative study of physical education and sport throughout civilization; emphasis on background influences on U.S. program.

PE **522 Pedagogy Applied to Physical Education** (3 cr). Study and analysis of teaching strategies and behaviors as they affect teaching and learning in physical education.

PE **544 Program Development** (3 cr). Developing physical education and sport program; emphasis on new methods and curriculum content. Two days of field trips may be reqd.

PE **550 Sport in Society** (3 cr). Sociological aspects of sport with emphasis on cultural impact of sport on society and vice versa; economics and politics of sports as they apply in American society.

PE **560 Sport Psychology** (3 cr). Individual differences as they apply to sport performance; emphasis on aggression, affiliation, motivation, and personality traits of sport participant.

PE **561 Motivation in Sport and Recreation** (3 cr). Practical, hands-on course designed to teach basics of motiviation to physical educators, coaches, and recreation professionals; major achievement motivation theories and primary antecedents and consequences of motivated behavior; five major motivational enhancement strategies including goal setting, personal science, competition, feedback, and reinforcement; guidelines for maximizing effectiveness; analysis of applied motivation questions such as dropouts/burnouts, peak performance, exercise adherence, injury rehabilitation, increasing enjoyment, designing reward systems, and positive parental involvement.

PE **WS564 Mechanical Analysis of Motor Activity** (3 cr). WSU PEP 564.

PE **WS566 Biomechanics** (2-3 cr). WSU PEP 566.

PE **567 Physical Education and Recreation for the Severely Handicapped** (3 cr). See PE J467/J567.

PE **570 Ethics in Physical Education and Sport** (3 cr). Problem solving approach to current ethical problems in leisure, physical education, and sport.

PE **571 Motor Evaluation of Handicapped** (3 cr). Evaluation of motor ability of handicapped children using various test devices; scoring of tests, interpreting results, and planning remedial programs.

PE **572 Program Application in Physical Education and Recreation for the Handicapped** (3 cr). Development of appropriate programs in physical education for handicapped people; emphasis on planning for all children with use of individualized ed program.

PE **581 Research in Physical Activity, Theory, and Design** (1-6 cr, max 6). Principles of scientific inquiry; application to the study of physical activity; individual research projects.

PE **591 Philosophical Influences in Sport** (3 cr). Use of the philosophical process in analyzing problems and issues in leisure and sport.

PE **WS592 Motor Learning** (3 cr). WSU PEP 591.

PE **593 Fitness Assessment and Prescription** (3 cr). See PE J493/J593.

PE **597** (s) **Practicum** (cr arr). Appl of theories and techniques. Graded P/F. Prereq: perm.

PE **598** (s) **Internship** (cr arr). Supervised field experience in an appropriate public or private agency. Graded P/F. Prereq: perm.

PE **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

PE **600 Doctoral Research and Dissertation** (cr arr).

RECREATION

Rec **102 Introduction to Recreation Professions** (1 cr). Same as ResRc 102. Intro to recreation and its related management problems, resources, and professional opportunities. Graded P/F.

Rec **ID110 Recreation for Special Populations** (3 cr). WSU RLS 110. Overview of recreation for special populations with emphasis on history, etiology, characteristics, services, resources, professional competencies and opportunities, and recreation programs. Two 1-day field trips may be reqd.

Rec **125 Outdoor Leisure Pursuits** (2 cr). Focus on wide range of outdoor leisure pursuits available in America, the public and private entities that administer them, and changes that increasing demand will necessitate in the future. Field trips reqd.

Rec **WS181 Introduction to Hospitality Services Industries** (3 cr). WSU H A 181.

Rec **200** (s) **Seminar** (cr arr). Prereq: perm.

Rec **203** (s) **Workshop** (cr arr). Prereq: perm.

Rec **204** (s) **Special Topics** (cr arr).

Rec **220 Rock Climbing** (1 cr). Alt/yrs. Intro to fundamentals of basic rock climbing including: equipment, climbing techniques, knots, belaying, and rappelling; emphasis on skill development, risk management, and leadership. Three off-campus field sessions.

Rec **221 Mountaineering** (2 cr). Alt/yrs. Intro to fundamentals of mountaineering including: equipment; fundamentals; rock, snow, and ice techniques; climbing equipment; navigation; expedition planning and safety; emphasis on skill development and safety. One 3-day field trip. Prereq: Rec 220 or perm of instructor.

Rec **222 Cross Country Skiing** (1 cr). Alt/yrs. Intro to skills of cross country skiing including: equipment, waxing, climbing techniques, turns, downhill, and diagonal glides. One 1-day field trip.

Rec **223 Winter Camping** (2 cr). Alt/yrs. Intro to fundamental skills reqd to successfully travel in winter environment, including: equipment, trip planning, avalanche awareness, snow shelters, travel techniques, and safety including psychological and physiological aspects of cold/winter weather. One 1-day and one 2-day field trips. Prereq: Rec 222 or perm of instructor.

Rec **224 Whitewater Rafting** (1 cr). Alt/yrs. Intro to skills of whitewater rafting including: equipment, trip planning, permits, safety, river hazards and accidents, river reading and water situations, techniques, self rescue, and river impact. One or two field trips.

Rec **225 Kayaking** (1 cr). Alt/yrs. Intro to skills of whitewater kayaking including: equipment, eskimo rolls, eddy turns, ferrying, rapid maneuvering, river hazards, and safety/rescue. One 2-day field trip.

Rec **ID230 Principles of Therapeutic Recreation** (3 cr). WSU RLS 230. Philosophy, design, and development of recreation programs for persons with disabling conditions, as well as theory and rationale of therapeutic recreation. Field experience reqd. Prereq: Rec 110.

Rec **WS235 Principles of Tourism** (3 cr). WSU H A 235.

Rec **243 Recreation Activities** (2 cr). Same as PE 243. Experience in planning, organizing, leading, and evaluating a broad range of games, social recreation, music, drama, arts and crafts, and special events activities.

Rec **254 Camp Leadership** (2-3 cr, max 3). Objectives, program, and philosophy of private, organizational, and school camp programs. One 3-4 day field trip.

Rec **255 Backpacking and Camping Skills** (2 cr). Lec, disc, dem, and practical applications in backpacking and camping skills. Field trips reqd. Prereq: perm.

Rec **256 Camp Counseling Practicum** (2-3 cr, max 3). For camp counselors who are employed by or assigned to approved camps. Cr granted on the basis of one cr for each two wks of camping. Student contracts with instructor for written work. Prereq: perm.

Rec **258 Survival Skills** (2 cr). Instruction, analysis, and practice of short- and long-term survival skills; developing student awareness of needs and values of survival training.

Rec **260 Leisure and Society** (3 cr). Expanding role of leisure in U.S. life; emphasis on factors influencing leisure; analysis of leisure values as related to the individual and society.

Rec **270 Big Game Hunting Techniques and Safety** (2 cr). Intro to safety, equipment, tech, and ethics of big game hunting.

Rec **275 Computer Applications in Leisure Services** (2 cr). Intro to specific computer programs currently used in leisure profession; emphasis on using computer to schedule leagues, facilities, registration, and professional management needs. One lec and 1 hr of lab a wk.

Rec **280 Recreation Practicum** (1 cr, max 2). Practical experience in agency recreation and leisure services. Forty clock hrs reqd a cr. Graded P/F. Prereq: perm of adviser.

Rec **299** (s) **Directed Study** (cr arr). Prereq: perm.

Rec **300 Swimming Pool Management** (2 cr). Professional pool and spa operator training that will yield certification through the National Swimming Pool and Spa Foundation. Pool and spa chemistry; plant maintenance and operation; chemical safety; energy considerations; health and safety codes; mechanical aspects of pools and spas. Two 1-day field trips.

Rec **320 Outdoor Recreation Leadership** (3 cr). Alt/yrs. Theory and practice of outdoor leadership techniques necessary for successful outdoor leaders. One 2-day field trip.

Rec **321 Wilderness Medicine and Evacuation** (1 cr). Alt/yrs. Fundamentals of handling wilderness emergencies; instruction including prevention, recognition, evaluation, treatment, and evacuation of injured people in remote situations. One 2-day field trip.

Rec **329 Leadership in Recreation** (3 cr). Intro to theories, methods, and styles of effective leadership; includes motivation, group dynamics, leadership skills, and abilities in the recreation and leisure setting.

Rec **ID330 Implications of Disabling Conditions** (3 cr). WSU RLS 330. Prevalent disabling conditions (incl etiology, symptomatology, and characteristics) and their implications for rec programming intervention in clinical and nonclinical settings. One or two field trips may be reqd. Prereq: Rec 110.

Rec **340 Leisure and Tourism Enterprises** (3 cr). Intro to resort and commercial leisure enterprises including history, types of services, trends, careers, and relationship between business and leisure programs, services, and products.

Rec **349 Municipal Park Administration and Maintenance** (2 cr). Alt/yrs. Prin, practices, and problems involved in public park management; emphasis on maintenance, finances, and administration. Two 1-day field trips may be reqd.

Rec **ID365 Leisure and the Aging Process** (3 cr). WSU RLS 365. Alt/yrs. Recreation programming for the elderly based on aging process, cultural influences, and psychological and sociological aspects; visitation and field experience reqd.

Rec **WS382 Hospital Management and Organization** (3 cr). WSU H A 381.

Rec **400** (s) **Seminar** (cr arr). Prereq: perm.

Rec **403** (s) **Workshop** (cr arr). Prereq: perm.

Rec **404** (s) **Special Topics** (cr arr).

Rec **J405/J505 Professional Development** (cr arr). Cr earned may not be applied toward grad degree program. Professional development and enrichment of recreational professionals. Additional projects/assignments reqd for grad cr.

Rec **410 Trends and Issues in Leisure Services** (3 cr). Current trends and issues in recreation and parks field; group discussion; background and experience in solving recreation problems through selected topics of current importance in recreation/parks field.

Rec **420 Experiential Education** (2 cr). Philosophy and administration of adventure activities, initiative games, ropes courses, and their application to individual and group development; program development and staff development.

Rec **425 Leisure Education** (3 cr). Historical and philosophical basis of leisure education and leisure counseling; emphasis on identification of individual interests and attitudes in relationship to recreation and leisure needs; review of existing programs, description of methods, techniques, instruments utilized; methods for developing individual leisure profiles.

Rec **ID430 Problems in Therapeutic Recreation** (3 cr). WSU RLS 430. Problems encountered in delivery of therapeutic recreation services to clients with special needs including discussion of service delivery models, current trends and research, and identification of funding sources. Prereq: Rec 110 and 230 or perm.

Rec **ID-J431/J531 Medical Terminology** (1 cr). WSU RLS 431. Intro to basic concepts of medical terminology and symbols related to working with people with disabilities. Additional projects/assignments reqd for grad cr.

Rec **445 Professional Seminar** (1 cr). Orientation to rec internship, professionalism, and employment tech incl dev of a vita and interviewing skills. Graded P/F.

Rec **460 History and Philosophy of Recreation and Leisure** (3 cr). Development of recreation movement and its cultural, social, and economic background; philosophies of significant leaders in the field; students develop a personal philosophy of recreation.

Rec **ID467 Physical Education and Recreation for the Severely Handicapped** (3 cr). Same as PE J467/J567. WSU RLS 467. Adaptation of physical education and recreation programs for the severely handicapped. Prereq: Rec 230 or perm.

Rec **J486/J586 Recreation Program Planning and Marketing** (3 cr). Planning and development of recreation programs and implementation of marketing techniques. Cr earned in Rec 586 by completion of additional projects/assignments.

Rec **J493/J593 Management of Leisure Services** (3 cr). Alt/yrs. Planning and development; leadership, facilities, finances, services, and public relations. Cr earned in Rec 593 by completion of additional projects/assignments.

Rec **495 Internship in Recreation** (cr arr). Supervised field work with a professional recreation agency. Prereq: Rec 280, 445, and sr standing.

Rec **498 Practicum in Tutoring** (1 cr, max arr). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

Rec **499** (s) **Directed Study** (cr arr). Prereq: perm.

Rec **505 Professional Development** (cr arr). See Rec J405/J505.

Rec **531 Medical Terminology** (1 cr). See Rec J431/J531.

Rec **586 Recreational Program Planning and Marketing** (3 cr). See Rec J486/J586.

Rec **593 Management of Leisure Services** (3 cr). See Rec J493/J593.

Rec **594 Sport and Recreation Budget and Finance** (3 cr). Policies and practices involved in acquisition, control, and financial management in sport and recreation agencies. Prereq: Acctg 201 or 395.

Rec **595 Sport and Recreation Facility Management** (3 cr). Management techniques and philosophies applied to recreation and sport facilities; includes operation, marketing, legislation and legal issues, personnel and technical design and planning. Field trips. Prereq: Bus 311.

Rec **596 Recreation and Sport Management Behavior** (3 cr). Management behavior and strategies related to recreation and sport agencies, including leadership, supervision, and a variety of administrative issues.

Rec **598** (s) **Internship** (cr arr). Supervised field experience in an appropriate leisure agency. Graded P/F. Prereq: perm.

Rec **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Curricular Requirements

DANCE (B.Dan.)

The curriculum leading to the degree of Bachelor of Dance is designed to give the student professional training in teaching, performing, choreography, and concert production.

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
Dan 105 Dance (incl modern, ballet, jazz, adv tech)	24-32
Dan 112 Basic Dance Forms	3
Dan 113 Problems in Dance Composition	2
Dan 210 Dance Theatre	4
Dan 220 Children's Dance	2
Dan 320 Labanotation	3
Dan 321 Dance Pedagogy	3
Dan 325 Dance Production	3
Dan 383 Dance Composition	4
Dan 410 Pre-professional Dance Theatre	4
Dan 420 Dance Accompaniment	3
Dan 421 Dance History	3
Art 101 Visual Art	3
MusC 120 Fundamentals of Music (or 2 semester of piano class)	2
MusH 100 Survey of Music	3
PE 300 Human Kinesiology	2
PE 418 Physiology of Exercise	3
Psych 305 or Ed 312 Developmental or Educational Psychology	2-3
ThA 103 Introduction to Stagecrafts	3
ThA 105-106 Basics of Performance	4
ThA 373 Stage Lighting	3
Two of the following courses	6
Eng 111-112 Literature of Western Civilization	
Eng 321 The Novel for Nonmajors	
Eng 325 Contemporary Literature for Nonmajors	
Two of the following courses	2
MusA 114 Individual Instruction (voice or piano)	
MusA 145-146 Piano Class	
MusA 147-148 Voice Class	
MusA 149-150 Voice for Actors	

Recommended electives:

Dance majors planning to qualify for the Standard Secondary-School Teaching Certificate must include college requirements and the following courses among the electives to complete the 128 credits for the degree and should elect Ed 312, Ed Psych, above:

Ed 201 Introduction to Teaching	2
Ed 314 Strategies for Teaching	2-3
Ed 328 Audiovisual Aids	1
Ed 340 Methods of Teaching Content Reading	3
Ed 433 Practicum (3 cr in Ed 435 may be substituted for 3 of the 9 cr in Ed 433)	9
Ed 445 Proseminar in Teaching	3
Ed 468 Historical & Philosophical Foundations of Ed	3

PHYSICAL EDUCATION (B.S.Ed.)

The major in physical education leads to certification in grades 1-12. This requires 14 credits of student teaching. Current advanced Red Cross first aid and basic water safety or emergency water safety (or advanced certification) certifications are required on graduation. Students who want K-12 certification must also take Ed 322.

Required course work includes the university requirements (see regulation J-3), general College of Education requirements, and:

Course	Credits
PE 160 Foundations of Physical Education & Education	3
PE 201 Fitness Activities & Concepts	2
PE 202 Skill & Analysis: Tumbling & Gymnastics	2
PE 240 Elementary School Physical Education	3
PE 260 Motor Learning	3
PE 300 Human Kinesiology	2
PE 305 Applied Sports Psychology or PE 310 Cultural & Philosophical Aspects of Sport	2-3
PE 320 Methods & Materials in Physical Education	3
PE 321 Physical Education Teaching Lab	1
PE 380 Measurement & Evaluation	3
PE 418 Physiology of Exercise	3
PE 424 Physical Education for Special Populations	3
PE 440 Physical Education & Sport Management	3
Dan 112 Basic Dance Forms	3
H&S 150 Wellness Lifestyles	3
H&S 323 Health Methods	3
Zool 119 Human Anatomy & Physiology	5
Skill & Analysis courses: select 6 courses from PE 112, 113, 114, 115, 116, 117, 118, 119, 122	6
Survey courses: select 2 courses from PE 123, 124, 243	2-3

And the satisfactory completion of an approved teaching minor.

NOTE: Students who complete a teaching major in a second field may have the above list of requirements reduced to 30 credits with the approval of the division.

A single-subject 60-credit major in physical education includes the above courses and an approved physical education concentration. See the division office for information on concentrations.

RECREATION (B.S.Rec.)

This curriculum is primarily for students interested in careers in leadership, supervision, or management of recreation agencies.

Required course work includes the recreation major, the university requirements (see regulation J-3), division requirements, and completion of an academic minor or 20 credits in an approved cognate area of study. Note: Students should contact adviser before registering for courses to satisfy regulation J-3.

Course	Credits
Acctg 201 Principles of Accounting	3
Bus 250 Microcomputer Software or BusEd 415 Microcomputer Applications	1-3
BLaw 265 Legal Environment of Business	3
Eng 205 Advanced Expository Writing or 313 Business Writing or 317 Technical & Engineering Report Writing	3
Psych 305 Developmental Psychology	3
Four courses selected from PE 105, 106, 107, 112, 113, 114, 115, 116, 117, 118, 119, 201, or 202	4-5
Aquatic course (Lifeguarding/WSI recommended)	1
Current certification in adv first aid and emergency care	
Electives to total 128 cr for the degree	—

Recreation Core:

Rec 102 Introduction to Recreation Professions	1
Rec 110 Introduction to Recreation for Special Populations	3
Rec 125 Outdoor Leisure Pursuits	2
Rec 260 Leisure & Society	3
Rec 275 Computer Applications in Leisure Services	2
Rec 329 Leadership in Recreation	3
Rec 349 Municipal Park Admin & Maintenance or Rec 340 Leisure & Tourism Enterprises	3
Rec 365 Leisure & the Aging Process	3
Rec 410 Trends & Issues in Leisure Services	3
Rec 425 Leisure Education	3
Rec 445 Professional Seminar	1
Rec 460 History & Philosophy of Recreation & Leisure	3
Rec 486 Recreation Program Planning & Marketing	3
Rec 493 Management of Leisure Services	3
Rec 495 Internship in Recreation	9
ResRc 310 Leisure Services Research & Evaluation	3
Additional courses selected from the following	9
Rec 243 Recreation Activities	
Rec 254 Camp Leadership	
Rec 300 Swimming Pool Management	
Rec 340 Leisure & Tourism Enterprises (if not chosen above)	
Rec 349 Municipal Park Admin & Maintenance (if not chosen above)	
Rec 420 Experiential Education	

SPORT SCIENCE (B.S.P.E.)

This curriculum is for students interested in professional opportunities that do not require teaching certification. Graduates will be prepared to work in the general areas of sport, corporate, clinical, or private wellness programs, or enter graduate studies.

Required course work includes the university requirements (see regulation J-3), an approved 20-credit cognate area of study, 19-20 credits of other requirements of the Division of Health, Physical Education, Recreation and Dance that support the sport science major (see the division director for necessary courses in the university requirements, cognate area of study, and other division requirements), and the following.

Note: See the division director for information on which students should select courses listed as "or."

Course	Credits
HEc 205 Concepts in Human Nutrition	3
H&S 150 Wellness Lifestyles	3
H&S 289 Drugs in Society	2
H&S 350 Stress Management	2
PE 160 Foundations of Physical Education & Education	3
PE 201 Fitness Activities & Concepts	2
PE 260 Motor Learning	3
PE 300 Human Kinesiology	2
PE 305 Applied Sports Psychology or PE 310 Cultural & Philosophical Aspects of Sport	2-3
PE 380 Measurement & Evaluation	3
PE 418 Physiology of Exercise	3
PE 493 Fitness Assessment & Prescription or PE 305/310 (not taken above)	2-3
PE 495 Internship in Physical Education (summer preferred)	9
PE 498 Practicum in Tutoring	2
Rec 330 Implications of Disabling Conditions	3
Rec 445 Professional Seminar	1
PE activity/skill classes (see division dir for selection)	5
Electives to total 128 cr for the degree	—

Sport science options/studies are available in the following areas: athletic training, communication, business, exercise specialist, fitness/wellness, prephysical therapy, research, sport psychology, and wellness. Consult the director of the Division of Health, Physical Education, Recreation, and Dance for specific course requirements.

Academic Minor Requirements

ATHLETIC TRAINING MINOR

Note: Chem 103 and Zool 119 are required for students who select this minor.

Course	Credits
H&S 245 Introduction to Athletic Injuries	3
H&S 289 Drugs in Society	2
H&S 349 Advanced Athletic Injuries	3
H&S 410 Athletic Rehabilitation & Administration	2
H&S 498 Practicum in Tutoring	2
HEc 205 Concepts in Human Nutrition	3
HEc 305 Nutrition Related to Fitness & Sport	2
PE 300 Human Kinesiology	2
PE 418 Physiology of Exercise	3
Rec 431 Medical Terminology	1

COACHING MINOR

Note: Zool 119 is required to students who select this minor.

Course	Credits
H&S 245 Introduction to Athletic Injuries	3
H&S 289 Drugs in Society	2
H&S 349 Advanced Athletic Injuries	3
HEc 305 Nutrition Related to Fitness & Sport	2
PE 204 Special Topics: Coaching	4
PE 300 Human Kinesiology or PE 418 Physiology of Exercise	2-3
PE 305 Applied Sports Psych or PE 310 Cultural & Phil Aspects of Sport	2-3
PE 497 Athletic Program Management	3
PE 498 Practicum in Tutoring	1

DANCE MINOR

Course	Credits
Dan 320 Labanotation	3
Dan 325 Dance Production	3
Dan 383 Dance Composition	2
Dan 420 Dance Accompaniment	3
Dan 421 Dance History	3
Electives in theatrical dance tech (selected from ballet, jazz, modern)	7

OUTDOOR RECREATION LEADERSHIP MINOR

Course	Credits
Rec 280 Recreation Practicum or ResRc 397 Renewable Natural Resources Internship	1-3
Rec 320 Outdoor Recreation Leadership	3
Rec 321 Wilderness Medicine & Evacuation	1
Rec 420 Experiential Education	2
ResRc 287 Principles of Wildland Recreation Management	2
ResRc 387 Environmental Interpretive Methods or 488 Interpretive Methods Lab	3
ResRc 490 Wilderness Management or 487 Introduction to Field Environmental Education	2-3
Courses selected from the following	7
Rec 220 Rock Climbing	
Rec 221 Mountaineering	
Rec 222 Cross Country Skiing	
Rec 223 Winter Camping	
Rec 224 Whitewater Rafting	
Rec 225 Kayaking	
Rec 255 Backpacking & Camping Skills	
Rec 270 Big Game Hunting Techniques & Safety	
One of the following courses	1-2
Rec 498 Practicum in Tutoring (1 cr)	
ResRc 401 Practicum in Tutoring (1-2 cr)	

RECREATION MINOR

Course	Credits
Rec 102 Introduction to Recreation Professions	1
Rec 260 Leisure & Society	3
Rec 280 Recreation Practicum	1
Rec 329 Leadership in Recreation	3
Rec 460 History & Philosophy of Recreation & Leisure	3
Rec 486 Recreation Program Planning & Management	3
Rec 493 Management of Leisure Services	3
Recreation electives	4

THERAPEUTIC RECREATION MINOR

Course	Credits
Psych 311 Abnormal Psychology	3
Rec 230 Principles of Therapeutic Recreation	3
Rec 280 Recreation Practicum	2
Rec 330 Implications of Disabling Conditions	3

Rec 430 Problems in Therapeutic Recreation 3
Rec 431 Medical Terminology 1
Rec 467 PE & Recreation for Severely Handicapped 3
SpEd 275 Education of Exceptional Individuals 3
Approved electives in special education or adapted PE 2-3

TOURISM AND LEISURE ENTERPRISES MINOR

Course	Credits
Bus 321 Marketing	3
Rec/ResRc 181 Introduction to Hospitality Services Industries	3
Rec 235/ResRc 236 Principles of Tourism	3
Rec 280/ResRc 397 Practicum/Internship	2
Rec 340 Leisure & Tourism Enterprises	3
Rec 382/ResRc 381 Hospitality Management & Organization	3
Rec/ResRc 400 Seminar	1
ResRc 383 Natural Resource Tourism	3
One course selected from the following	3
Bus 420 Promotional Strategy	
Geog 447 Recreation & Tourism	
Rec 486 Recreation Program Planning & Marketing	
ResRc 386 Resource Recreation & Tourism Planning	

Department of History

Wm. Kent Hackmann, Dept. Chair (315 Admin. Bldg.). Faculty: Katherine G. Aiken, Wm. Kent Hackmann, Craig E. Harline, Carlos A. Schwantes, Richard E. Spence, William R. Swagerty, Judith L. Sweeney. Affiliate Faculty: Jacqueline Peterson-Swagerty, Merle W. Wells.

The study of history provides a broad, general view of human development from the beginning of recorded time to the present. Emphasis is on intellectual and cultural values and activities in political, social, economic, and religious institutions. Each course provides rigorous training of the mind to think, to evaluate problems, and to reach sound conclusions through the examination of general or specific chronological periods in several geographic settings. Special attention is given to written work in the form of quizzes, examinations, and review or research essays.

A major in history can be used in government service, the new specialty of public history, several areas of business and industry, and many other fields. It can also be used in preparation for study of the law, the ministry, and archival work and librarianship. Double majors combining history with other fields are easily arranged.

The history curricula provide, through lectures, seminars, and directed studies, a survey of mankind's experience. The department offers courses of study leading to the B.A. or the B.S. degree and has a staff of eight full-time professors who hold the Ph.D. degree. The historian's laboratory is the library, where one finds the record of the past as preserved in primary sources and interpreted by authorities in general works, monographs, and maps. The department has a good collection of maps, slides, and microform readers.

Graduate study is offered in American, English, European (medieval through modern), Latin American, and ancient history. The degree programs include Master of Arts, Master of Arts in Teaching, and Doctor of Philosophy, for which dissertation topics are limited to the fields of the American West, and Europe since 1760. Undergraduates considering graduate study should master at least one modern foreign language through the intermediate level.

History Courses

PREREQUISITE: Two-semester courses in this field may be taken in either order. Students may enroll in second-semester courses without having had the first. Ordinarily six lower-division credits in history are advised for registration in upper-division courses.

Note: In jointly numbered courses, additional projects/assignments are required for graduate credit.

Hist **101-102 History of Civilization** (3 cr; 4 cr for honors sections) (C). Satisfies core requirement J-3-d. Contributions to the modern world. Hist 101: to 1650. Hist 102: 1650 to present.

Hist **111-112 Introduction to U.S. History** (3 cr) (C). Political, diplomatic, economic, social, and cultural history; earliest times to the present. Hist 111: to 1877. Hist 112: 1877 to present.

Hist **180 Introduction to East Asian History** (3 cr). Survey of traditional and modern Chinese and Japanese hist.

Hist **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Hist **210 Introduction to Modern Latin American History** (3 cr). Survey of economic, political, social, and cultural developments in selected Latin American countries, each of which represents a large region, from independence to the present; emphasis on cultural uniqueness, economic development, pressures for social change, and mass political movements.

Hist **313 Red, White, and Black: The Peopling of Early North America** (3 cr). Survey; Native American, Euroamerican, and Afro-American heritage in North America, 1400-1790.

Hist **345 European Christianity, 500-1700** (3 cr). Early development of official, scholarly, monastic, heretical, and popular religious movements, including those of Gregory the Great, St. Benedict, Francis of Assisi, Catherine of Siena, Master Eckhart, the Waldensians, Albigensians, Flagellants, Teresa of Avila, Luther, or Cornelius Jansen.

Hist **350 European Popular Culture, 1500-1800** (3 cr). History of ordinary people in early modern Europe, with attention to social and economic life, material culture, popular pastimes, and especially thought or "mentalities."

Hist **366 Intellectual and Cultural History of Modern Europe** (3 cr). Evolution of attitudes and values of European societies during 19th and 20th centuries; influence of key events and ideas, including those of Marx, Darwin, Freud, Einstein, and Sartre.

Hist **371-372 History of England** (3 cr) (C). Political, social, economic, and religious development of the British Isles. Hist 371: to 1688. Hist 372: 1688 to present.

Hist **J401/J501** (s) **Seminar** (cr arr). Research papers in U.S., Latin American, ancient, English, or European history. Prereq: perm of dept.

Hist **404** (s) **Special Topics** (cr arr).

Hist **J406/J506 Colloquium in American History** (3 cr). Reading and analyzing historical literature in American history.

Hist **J407/J507 Colloquium in European History** (3 cr). Reading and analyzing historical literature in European history.

Hist **J408/J508 Colloquium in Latin American History** (3 cr). Reading and analyzing historical literature in Latin American history.

Hist **J410/J510 Land and the American Imagination** (3 cr). History, literary, and artistic images, perceptions, and experiences of Europeans and Euroamericans in North America, 1500 to present.

Hist **J411/J511 American Colonial History to 1763** (3 cr). International rivalries; British colonial foundations.

Hist **J412/J512 The American Revolution, 1763-1789** (3 cr). U.S. independence through the adoption of the Constitution.

Hist **J413/J513 U.S.: Early National Period** (3 cr). Economic, political, constitutional, and social problems; 1789 to 1828.

Hist **J415/J515 Civil War and Reconstruction, 1828-1877** (3 cr). Sectionalism, westward expansion, slavery, the Civil War and Reconstruction.

Hist **J416/J516 Rise of Modern America, 1877-1900** (3 cr). Industrial and economic development, political reform, populism.

Hist **J417/J517 United States, 1900-1941** (3 cr). Populism, Progressivism, World War I, the Twenties, the Depression, and the New Deal.

Hist **J418/J518 Recent America** (3 cr). America since 1941.

Hist **J420/J520 History of Women in American Society** (3 cr). Examination of the roles of women—social, economic, and political—in U.S. history from colonial times to the present.

Hist **J423/J523 Idaho and the Pacific Northwest** (3 cr) (C, 423 only). Political, economic, social development; earliest times to the present.

Hist **WS-J427/WS-J527 Introduction to Public History** (3 cr). WSU Hist 427/527.

Hist **J428/J528 History of the American West** (3 cr). Spanish beginnings, Anglo-French expansion, the American occupancy, 1540 to present.

Hist **J429-J430/J529-J530 U.S. Diplomatic History** (3 cr). Hist J429/J529: from independence to world power, 1763-1898. Hist J430/J530: world power through war and the quest for peace, 1898 to present.

Hist **J431/J531 History of Indian-White Relations** (3 cr). Same as Soc J433/J533. Survey 1400 to present; dynamics and themes of Indian history with emphasis on Indian-White relations in the U.S.

Hist **J432/J532 The Canadian and American Western Experiences** (3 cr). Comparative framework for analysis of major issues and events in history of the Canadian West; a balance of Canadian and American western history.

Hist **J433-J434/J533-J534 Social and Cultural History of the U.S.** (3 cr). U.S. customs, traditions, and intellectual habits. Hist J433/J533: to 1865. Hist J434/J534: 1865 to 1950.

Hist **J435/J535 Latin America: The Colonial Era** (3 cr). Indian civilization, European colonization, Spanish Imperial System, wars of independence.

Hist **J436/J536 Introduction to Canadian History** (3 cr). First European contact with natives; political and socio-economic development to 1873.

Hist **J437/J537 Modern Canada** (3 cr). Survey and analysis of political, economic, social, and cultural aspects from Confederation (1867) to the present; emphasis on economic development, Canadian-U.S. relations, Quebec nationalism, Western Regionalism, and modern Canadian polity.

Hist **J438/J538 Modern Mexico** (3 cr). Survey and analysis of political, economic, social, and cultural aspects from independence to present; emphasis on Iberian and Amerindian legacies, economic development, relations with U.S., and social revolution of 1910-1920.

Hist **J439/J539 Modern Latin America** (3 cr). Political, economic, social, and cultural development; search for stability; growth of nationalism.

Hist **J440/J540 Social Revolution in Latin America** (3 cr). Analysis and comparison of 20th-century social revolution in selected Latin American countries: Cuba and two others; emphasis on origins of movements for social change, economic development issues, impact of the revolutions, and relations between new governments and the U.S.

Hist **J446/J546 Medieval Europe** (3 cr). Transition from classical Mediterranean civilization to medieval civilization, 400 to 1350 A.D.

Hist **J447/J547 Renaissance Europe** (3 cr). Nature and significance of Italian Renaissance and its early influence on northern Europe; 1300-1550.

Hist **J449/J549 Reformation Europe** (3 cr). Protestant and Catholic Reformations, from the time of Luther through the climactic Wars of Religion; 1500-1650.

Hist **J451/J551 Age of the French Revolution** (3 cr). Nature of the Old Regime; relationship between the Enlightenment and the French Revolution; aims, progress, and consequences of the revolution itself; Europe, 1650-1815.

Hist **J452/J552 19th Century Europe** (3 cr). Nationalism and nation-building; Imperialism and the Great Powers; Capitalism and Socialism; tensions and rivalries leading to WWI.

Hist **J455/J555 20th Century Europe** (3 cr). World Wars, revolutions, and totalitarianism; decline and fall of the European empires; rise of a New Europe.

Hist **J457/J557 History of the Middle East** (3 cr). Survey of the Middle East from the beginning of the Islamic period to the present.

Hist **J458/J558 Military History** (3 cr). Survey of military history from ancient times to present; emphasis on interrelationship of war, society, and technology.

Hist **J467/J567 Russia to 1894** (3 cr). Russia from medieval origins to 1894; development of Tsarist autocracy and serfdom; reaction, reform, and rise of the revolutionary movements.

Hist **J468/J568 Russia and Soviet Union Since 1894** (3 cr). The last years of Tsarism; revolutions of 1905 and 1917; development of the Soviet Union under Lenin, Stalin, and their successors.

Hist **J469/J569 Modern France** (3 cr). French nation from 1815 through the De Gaulle era.

Hist **J470/J570 Germany and Central Europe Since 1815** (3 cr). Development of Germany from pre-Bismarck era to present; parallel developments in the Habsburg monarchy and the "successor" states (Poland, Czechoslovakia, Austria, and Hungary).

Hist **J473/J573 Tudor England** (3 cr). Revolution in church and state; social and economic change; exploration.

Hist **J474/J574 Stuart England** (3 cr). Conflict between King and Parliament, Catholic and Puritan; wars and colonization; economic changes.

Hist **J482/J582 Japan, 1600 to Present** (3 cr). Western impact on the political, cultural, and economic fabric of Japanese society.

Hist **J483/J583 Traditional Chinese Civilization** (3 cr). Survey from prehistoric beginnings through 1840s.

Hist **J484/J584 Modern China, 1840s to Present** (3 cr). Last century of Qing dynasty, 1911 Revolution and Republican experiment, Revolution of 1949, and People's Republic of China.

Hist **490 Senior Research Seminar** (3 cr). Techniques in compiling a bibliography, assembling material, composition, interpretation, and historic criticism. Prereq: six hrs of upper-div hist and perm.

Hist **499** (s) **Directed Study** (cr arr).

Hist **500 Master's Research and Thesis** (cr arr).

Hist **501** (s) **Seminar** (cr arr). See Hist J401/J501.

Hist **502** (s) **Directed Study** (cr arr).

Hist **504** (s) **Special Topics** (cr arr).

Hist **506 Colloquium in American History** (3 cr). See Hist J406/J506.

Hist **507 Colloquium in European History** (3 cr). See Hist J407/J507.

Hist **508 Colloquium in Latin American History** (3 cr). See Hist J408/J508.

Hist **510 Land and the American Imagination** (3 cr). See Hist J410/J510.

Hist **511 American Colonial History to 1763** (3 cr). See Hist J411/J511.

Hist **512 The American Revolution, 1763-1789** (3 cr). See Hist J412/J512.

Hist **513 U.S.: Early National Period** (3 cr). See Hist J413/J513.

Hist **515 Civil War and Reconstruction, 1828-1877** (3 cr). See Hist J415/J515.

Hist **516 Rise of Modern America, 1877-1900** (3 cr). See Hist J416/J516.

Hist **517 United States, 1900-1941** (3 cr). See Hist J417/J517.

Hist **518 Recent America** (3 cr). See Hist J418/J518.

Hist **520 History of Women in American Society** (3 cr). See Hist J420/J520.

Hist **523 Idaho and the Pacific Northwest** (3 cr). See Hist J423/J523.

Hist **WS525 Pacific Northwest Seminar** (cr arr). WSU Hist 525. Enrollment is limited to grad students.

Hist **WS527 Introduction to Public History** (3 cr). See Hist J427/J527.

Hist **528 History of the American West** (3 cr). See Hist J428/J528.

Hist **529-530 U.S. Diplomatic History** (3 cr). See Hist J429-J430/J529-J530.

Hist **531 History of Indian-White Relations** (3 cr). See Hist J431/J531.

Hist **532 The Canadian and American Western Experiences** (3 cr). See Hist J432/J532.

Hist **533-534 Social and Cultural History of the U.S.** (3 cr). See Hist J433-J434/J533-J534.

Hist **535 Latin America: The Colonial Era** (3 cr). See Hist J435/J535.

Hist **536 Introduction to Canadian History** (3 cr). See Hist J436/J536.

Hist **537 Modern Canada** (3 cr). See Hist J437/J537.

Hist **538 Modern Mexico** (3 cr). See Hist J438/J538.

Hist **539 Modern Latin America** (3 cr). See Hist J439/J539.

Hist **540 Social Revolution in Latin America** (3 cr). See Hist J440/J540.

Hist **546 Medieval Europe** (3 cr). See Hist J446/J546.

Hist **547 Renaissance Europe** (3 cr). See Hist J447/J547.

Hist **549 Reformation Europe** (3 cr). See Hist J449/J549.

Hist **551 Age of the French Revolution** (3 cr). See Hist J451/J551.

Hist **552 19th Century Europe** (3 cr). See Hist J452/J552.

Hist **555 20th Century Europe** (3 cr). See Hist J455/J555.

Hist **557 History of the Middle East** (3 cr). See Hist J457/J557.

Hist **558 Military History** (3 cr). See Hist J458/J558.

Hist **567 Russia to 1894** (3 cr). See Hist J467/J567.

Hist **568 Russia and Soviet Union Since 1894** (3 cr). See Hist J468/J568.

Hist **569 Modern France** (3 cr). See Hist J469/J569.

Hist **570 Germany and Central Europe Since 1815** (3 cr). See Hist J470/J570.

Hist **573 Tudor England** (3 cr). See Hist J473/J573.

Hist **574 Stuart England** (3 cr). See Hist J474/J574.

Hist **582 Japan, 1600 to Present** (3 cr). See Hist J482/J582.

Hist **583 Traditional Chinese Civilization** (3 cr). See Hist J483/J583.

Hist **584 Modern China, 1840s to Present** (3 cr). See Hist J484/J584.

Hist **591-592 Historiography** (3 cr). Nature of history; major historians; ideas in history; philosophy of history; bibliography. Hist 591: U.S. historians. Hist 592: European and British historians.

Hist **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Hist **600 Doctoral Research and Dissertation** (cr arr).

Curricular Requirements

HISTORY (B.A.)

Note: Recommended preparation should include at least 6 credits from introductory courses in any two other social sciences. The choice of specific courses in each group below must be approved by the student's adviser from the Department of History.

Required course work includes the university requirements (see regulation J-3), the general requirements for the B.A. degree, and:

Course	Credits
Lower-division courses selected from the following	12
Hist 101-102 History of Civilization	
Hist 111-112 Introduction to U.S. History	
Hist 180 Introduction to East Asian History	
Hist 210 Intro to Modern Latin American History	
Upper-division history courses, including Hist 490	20
Related fields	20

HISTORY (B.S.)

Note: Students expecting to take graduate work in history are strongly urged to take the B.A. rather than the B.S. degree.

Recommended preparation should include at least 6 credits from introductory courses in any two other social sciences. The choice of specific courses in each group below must be approved by the student's adviser from the Department of History.

Required course work includes the university requirements (see regulation J-3), the general requirements for the B.S. degree, and:

Course	Credits
Lower-division courses selected from the following	12
Hist 101-102 History of Civilization	

Hist 111-112 Introduction to U.S. History
Hist 180 Introduction to East Asian History
Hist 210 Intro to Modern Latin American History
Upper-division history courses, including Hist 490 20
Related fields 20
Any combination of the following 12
Any foreign language (high-school foreign language may be substituted at the rate of 4 cr per year)
Eng 111-112 Literature of Western Civilization
FL/EN 313-314 Modern French Literature in Translation
FL/EN 323-324 German Literature in Translation
FL/EN 363-364 Literature of Ancient Greece & Rome
FL/EN 393 Spanish Literature in Translation
FL/EN 394 Latin American Literature in Translation

Academic Minor Requirements

HISTORY MINOR

Course	Credits
History courses chosen from the following*	9
Hist 101-102 History of Civilization	
Hist 111-112 Introduction to U.S. History	
History courses at the 300- or 400-level (at least 3 cr in U.S. or Latin American hist and at least 3 cr in Ancient or European hist)	9
History elective (may be course not taken above)	3

*For demonstrable cause, department chair or minor adviser may allow substitution of courses numbered above 100-level.

Margaret Ritchie School of Home Economics

Peggy J. Pletcher, Director (105 Mary Hall Niccolls Home Economics Bldg.). Faculty: Laurel J. Branen, Janice W. Fletcher, Rose L. Forbes, Linda K. Fox, Kathe A. Gabel, Virginia W. Junk, Kathleen M. Kearney, Shirley R. Medsker, Penelope L. Nielsen, Peggy J. Pletcher, Ernestine Porter, Laurie A. Stenberg, Marilyn A. Swanson, Nancy J. Wanamaker, Doris K. Williams.

Home economics focuses on the relationships, resources, and services contributing to individual and family well being. It is concerned with the aesthetic, economic, biological, physical, social, and psychological needs of people.

The programs developed in the five curricular areas in the School of Home Economics were designed to meet professional and individual goals of students. The five areas are (1) child development and family relations; (2) clothing, textiles, and design; (3) food and nutrition with two options of consortium coordinated undergraduate dietetic program and food and nutrition research; (4) general home economics with three options of general, business, and communications; and (5) home economics education with two options of classroom teaching and extension.

Emphasis choices under the curricular areas are (1) child development and family relations: human services, education (double major possible), and child life; (2) clothing, textiles, and design: apparel design and fashion merchandising; (3) food and nutrition: dietetics; and (4) general home economics: consumer foods.

A Master of Science degree in home economics is available.

The Ritchie School of Home Economics has an outstanding scholarship program for entering freshmen, continuing undergraduate majors, and home economics graduate students. Most scholarships are awarded on the basis of academic excellence regardless of financial need.

Home Economics Courses

Note: Courses numbered 363, 364, 385, 472, 473, 486, and 488 are taught at Eastern Washington University, Cheney. EWU is on the quarter system; however, credits are listed in this catalog in equivalent semester hours.

HEc **105 Individual and Family Development** (3 cr). Basic principles and sequences in individual and family development; family structure and functions as they support human development.

HEc **123 Textiles** (3 cr). Properties of fibers, yarns, and fabric structure, dyes and finishes, labeling, and legislation affecting the consumer.

HEc **124 Clothing Construction Principles** (3 cr). Principles of clothing constr and fitting; analysis and comparison related to efficiency, wear, appearance, fabric limitations. One lec and six hrs of lab a wk.

HEc **170 Introductory Foods** (3 cr). Fundamental processes underlying food preparation with emphasis on physical and chemical aspects. Two lec and one 3-hr lab a wk. Prereq: 3 cr in physical science courses.

HEc **200** (s) **Seminar** (cr arr). Prereq: perm.

HEc **203** (s) **Workshop** (cr arr). Prereq: perm.

HEc **204** (s) **Special Topics** (cr arr).

HEc **205 Concepts in Human Nutrition** (3 cr). Nutrition principles with their application to nutrition in life cycle; nutrition problems and controversies such as weight control and nutrition for athletes; individual computerized study of student's dietary intake.

HEc **206 Color and Design** (3 cr). Principles and elements of design as they relate to the near environment; development of awareness of application of design to clothing, housing, textiles, and other home economic areas. Two lec and two labs a wk.

HEc **208 Decision Making for Consumers** (3 cr). Decision-making process as it influences effective consumer practices in food, clothing, shelter, and personal finance.

HEc **229 Introduction to Fashion Industry** (3 cr). Overview of development, manufacturing, and retailing of fashion, including raw materials of fashion, ready-made apparel evaluation, and terminology used in fashion industry. Field trips.

HEc **234 Infancy and Early Childhood** (3 cr). Influences on development before birth through the preschool years; factors that determine physical, emotional, cognitive, social, and creative development.

Hec **235 Principles and Methods of Child Observation** (3 cr). Development of skills necessary to observe, record, and interpret child behavior; observations to be arranged. Prereq: HEc 234 or perm.

HEc **240 Intimate Relationships** (3 cr). Dynamics of intimate relationships from early adulthood through the adult lifespan.

HEc **270 Intermediate Foods** (3 cr) (HEc 271). Sensory evaluation, meal planning, consumer issues, cultural influences on food choices. Two lec and one 2-hr lab a wk. Prereq: HEc 170.

HEc **299** (s) **Directed Study** (cr arr). Prereq: perm.

HEc **305 Nutrition Related to Fitness and Sport** (2 cr). Identification of energy, macro/micro nutrient and fluid requirements during exercise; fitness of dietary regimens and ergogenic aids for pre and post competition, weight maintenance, and wellness. Prereq: HEc 205.

HEc **309 Trends and Perspectives in Home Economics** (1 cr). Key issues and trends of the past, present, and future for home economics as a profession. Recommended for undergrad majors.

HEc **ID314 Weaving** (3 cr). WSU AMT 313. Principles, techniques, and aesthetics of handweaving. One lec and six hrs of lab a wk.

HEc **323 Intermediate Textiles** (2 cr). Lab investigation into fiber identification, dye application, fabric structure, care methods, performance standards, and textiles testing methods. One lec and 3 hrs of lab a wk. Prereq: HEc 123, Chem 103 or 111.

HEc **324 Flat Pattern Study** (3 cr). Fitting and pattern alteration for individual shell and sloper; flat pattern design; construction related to original patterns. One lec and six hrs of lab a wk. Prereq: HEc 124 or perm.

HEc **326 Introduction to Housing and Home Furnishings** (3-4 cr). Overview of housing decisions facing the contemporary family; organization of living spaces to fit various lifestyles; interior materials and furnishings from sources through utilization and effects; home energy conservation. Registration for 4 cr incl additional 2 hrs of lab a wk.

HEc **327 Tailoring and Experimental Construction** (3 cr). Tailoring techniques; experimental construction as applied to special fabrics and/or designs. One lec and 6 hrs of lab a wk. Prereq: HEc 124.

HEc **329 Historic Costume** (3 cr). Costume as an expression of the times; includes social and psychological aspects of clothing and historical overview of costume.

HEc **333 Developmental Curriculum for Young Children** (3 cr). Prin of curriculum design incorporating the following areas: language and creative arts, science, food preparation, music, and movement. Two lec and one 3-hr lab a wk.

HEc **334 Middle Childhood-Adolescence** (3 cr). Behavior, development, and guidance of children and youth from entrance in school until they are launched into adulthood; influences of family, school, peer group, and larger community. Prereq: Psych 100, Soc 110, or perm.

HEc **340 Parent-Child Relationships in Family and Community** (3 cr). May be taken by nonmajors. Dynamics of parent-child interactions and models for parent education programs in community and school settings. Prereq: HEc 234 or 334.

HEc **346 Family Resource Management** (3-4 cr). Principles and procedures of management and their relationships to human and material resources; practical applications of management principles to use of family resources through supervised experience with attention to development of professional competence as well as personal skills.

HEc **347 Home Management Practicum** (3 cr). Decision making and managerial aspects of family living in a residential setting. One lec and 6 hrs of lab a wk. Prereq: HEc 170 and perm; prereq or coreq: HEc 346.

HEc **350 Communicating Home Economics Concepts** (3 cr). Applying communication skills and concepts in home economics related programs including multimedia, individual

and group leadership, presentation/dem techniques. Two lec and one 2-hr lab a wk; one 1-day field trip. Prereq: jr standing or perm.

HEc **356 Experiential and Leadership Programs** (1 cr). Principles and practices in planning, developing, conducting, supervising, and evaluating experiential and leadership programs for agricultural education, home economics education, and cooperative extension youth. Coreq: HEc 357 and AgEd 358 or 359.

HEc **357 Supervising FHA and Occupational Home Economics Programs** (2 cr). Role of home economics instructor in supervising FHA and Occupational Home Economics Programs. Coreq: HEc 356.

HEc **361 Advanced Nutrition** (4) (HEc 376). Principles of nutrition; physiology of digestion, absorption and metabolism of nutrients. Prereq: HEc 205, Biochem 380, Zool 119.

HEc **362 Introduction to Clinical Dietetics** (4 cr) (HEc 375). Dietetics, role of the dietitian; dietary depts in health care facilities. Three lec and three hrs of clinical experience a wk; one field trip to Spokane. Prereq: jr standing in CCPD.

HEc **363 Diet Therapy** (4 cr; see headnote) (HEc 371). Diet modification for adult and child needs in disease and convalescence. Clinical experience in Spokane hospitals. Prereq: jr standing in CCPD.

HEc **364 Clinical Dietetics I** (4.6 cr; see headnote) (HEc 372). Clinical experience in Spokane hospitals. Prereq: jr standing in CCPD.

HEc **384 Food Administration I** (4 cr). Quantity food production, buying, and equipment; intro to administration. Lab in UI food service. Two lec and six hrs of lab a wk. Prereq: jr standing in CCUPD.

HEc **385 Food Administration II** (4 cr; see headnote). EWU 386. Continuation of HEc 384. Lab in Spokane hospitals and EWU food service. Two lec and six hrs of lab a wk. Prereq: HEc 384.

HEc **400** (s) **Seminar** (cr arr). Prereq: perm.

HEc **403** (s) **Workshop** (cr arr). Prereq: perm.

HEc **404** (s) **Special Topics** (cr arr).

HEc **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

HEc **J409/J509 Adult Education Training and Development in Agriculture and Home Economics** (3 cr). See AgEd J409/J509.

HEc **413 Textile Dye Processes** (3 cr). Alt/yrs. Study of selection of dyes for fabrics, color matching through scientific method, color theory, and application of pattern through various dye techniques. Prereq: HEc 206 or perm.

HEc **ID414 Advanced Weaving** (3 cr). WSU AMT 414. Continuation of HEc 314 with concentration on drafting and designing woven structure. One lec and five hrs of lab a wk. Prereq: perm.

HEc **415 Textile Printing Processes** (3 cr). Alt/yrs. Study of various print processes on fabric, using dyes and pigments, incl block, screen, roller, mono print, and intaglio methods; application of various methods in lab to produce yardage. Prereq: HEc 206 or perm.

HEc **ID-J416/J516 Designing for the Loom** (3 cr). WSU AMT 416. Alt/yrs. Analysis of design techniques specific to woven fabrics; studio experience designing woven fabrics for functional and decorative end use, culminating in a critical display. Additional projects/assignments reqd for grad cr. One lec and 6 hrs of lab a wk.

HEc **WS417 Social Psychological Aspects of Clothing** (3 cr). WSU AMT 417.

HEc **WS-J423/WS-J523 Textile Evaluation** (3 cr). WSU AMT 415/515.

HEc **424 Original Apparel Design** (4 cr). Utilization of flat pattern and draping techniques to produce original designs; individual dress forms constructed and draping skills developed; emphasis on creative expression. Prereq: HEc 324 or perm.

HEc **426 History of Interiors and Furnishings** (2-3 cr). History and development of styles and design in furniture and interiors as expressions of changes in art and culture. Registration for 3 cr includes 2 hrs a wk of lab problems. Prereq: HEc 326 or perm.

HEc **428 Family Housing** (2 cr). Housing and families as affected by consumer issues, public policy, housing history, and social, economic, political, and technical factors.

HEc **ID&WS429 Fashion Merchandising** (3 cr). WSU AMT 318. Apparel merchandising planning, including merchandise selection, buying, and promotion; emphasis on merchandising mathematics. Prereq: HEc 229, Bus 321 or perm.

HEc **436 Theories of Child and Family Development** (3 cr). Identification, interpretation, and evaluation of individual and family developmental theories.

HEc **440 Contemporary Family Relationships** (3 cr). Dynamics of the major types of family relationships; marital, parent-child, sibling, and extended-family interaction in contemporary society. Prereq: Psych 100, Soc 110, or perm.

HEc **448 Consumer Education** (3 cr). Consumer motivation, decision making, and behavior; protection, organization, use of credit.

HEc **450 Methods and Curriculum in Home Economics Education** (4 cr). Curriculum development and organization of secondary and adult consumer/homemaking programs including methods and techniques, lesson planning, evaluation of learning, youth organization administration, and nature and scope of teacher's role. One 1-day field trip. Prereq: HEc 350, Ed 201, acceptance in teacher education program, or perm.

HEc **451 Profession of Vocational Home Economics Education** (1 cr). Orientation to student teaching to include profession of home economics educator, certification/endorsement standards and university services. One 1-day field trip.

HEc **452 Classroom and Lab Management** (3 cr). Classroom management to include student/teacher/program evaluation and student behavior/discipline; lab organization; teaching special students; pre-student-teaching experience. One 1-day field trip.

HEc **457 Student Teaching in Home Economics Classes** (9 cr, max 9). Supervised teaching at secondary-school level. Apply to home economics teacher educator one semester before registration. Prereq: HEc 350, 450, and VocEd J351/J551; cumulative GPA of 2.50; acceptance into teacher education program; sr standing.

HEc **460 Family as an Ecosystem** (3 cr). Survey of the literature and disc of environmental factors affecting contemporary families; analysis of the interrelationship of social change, and family values, structure, roles on the ecological system; determination of the role and potential contribution of family life to ecology.

HEc **470 Trends in Nutrition Research** (3 cr) (C). Nutrition research methodology, literature critique, and recent advances in nutrition and dietetics. Prereq: HEc 205.

HEc **472 Clinical Dietetics II** (5.3 cr; see headnote). Continuation of HEc 364. Practical experience in Spokane hospitals. Prereq: HEc 364, sr standing in CCPD.

HEc **473 Community Nutrition** (4 cr; see headnote). EWU 469. Nutrition program; nutrition problems of special groups. Clinical experience in Spokane school lunch program, public health, etc. Three lec and three hrs of lab a wk. Prereq: sr standing in CCUPD.

HEc **474 Investigation of Foods** (3 cr). Advanced problems in foods. Two lec and 3 hrs of lab a wk. Prereq: HEc 270, Biochem 380 or perm.

HEc **475 Nutrition Principles for the Classroom Teacher** (3 cr). For elementary and secondary school teachers. Teaching food selection and daily diet; variations from the normal diet; malnutrition, overnutrition, food fads, additives, obesity, and nutrition for athletes.

HEc **478 Recent Advances in Foods** (2 cr). Food preservation and processing; development of low-calorie foods and commercial mixes; food additives. Prereq: HEc 270 or equiv.

HEc **484 Food Systems Management I** (4 cr). Institutional organization and management. Lab experience in UI food service. Four lec and 12 hrs of lab a wk for nine wks. Prereq: HEc 385, sr standing in CCUPD.

HEc **485 Computer Applications in Food Administration** (2 cr). Nutrient analysis and management of ingredients, recipes, menus, and related functions. Prereq or coreq: HEc 384 or perm.

HEc **486 Nutrition in the Life Cycle** (2.6 cr; see headnote). EWU 470. Maternal nutrition and fetal development; lactation; nutritional needs and dietary patterns from infancy through old age.

HEc **488 Food Systems Management II** (4 cr; see headnote). EWU 486. Continuation of HEc 484. Lab in EWU food service and Spokane hospitals. Prereq: HEc 484.

HEc **496 Internship: Fashion Business** (3-9 cr). Supervised experience in fashion business: fashion design, textile/apparel manufacturing, retailing, merchandising; geared to career goals of student. Graded P/F. Prereq: perm.

HEc **497** (s) **Home Economics Practicum** (cr arr). On- or off-campus supervised applied experience in home economics major areas; child development and family relations; clothing, textiles, and home design; food and nutrition; consumer education; and cooperative extension. Prereq: perm.

HEc **498** (s) **Home Economics Internship** (3-9 cr). Supervised internship in education institutions, governmental/social agencies, hospitals, business, or industry; geared to the professional goals of students. Prereq: perm.

HEc **499** (s) **Directed Study** (cr arr). Prereq: perm.

HEc **500 Master's Research and Thesis** (cr arr).

HEc **501** (s) **Seminar** (cr arr). Prereq: perm.

HEc **502** (s) **Directed Study** (cr arr). Prereq: perm.

HEc **503** (s) **Workshop** (cr arr). Prereq: perm.

HEc **504** (s) **Special Topics** (cr arr).

HEc **506** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

HEc **507 Research Methodology** (3 cr). See AgEc 507.

HEc **509 Adult Ed Training and Development in Agriculture and Home Economics** (3 cr). See HEc J409/J509.

HEc **516 Designing for the Loom** (3 cr). See HEc J416/J516.

HEc **WS523 Textile Evaluation** (3 cr). See HEc J423/J523.

HEc **540 Parent-Child Relationships** (2 cr). Open to nonmajors. The developing family; patterns of child rearing. Prereq: HEc 234 or 334, 440, and 6 cr in psychology and/or sociology or equivalent.

HEc **551 Techniques of Supervision** (2 cr).

HEc **553 Home Economics Education** (1-4 cr, max 4).

HEc **554 Curriculum in Home Economics** (2 cr). Problems and planning in secondary-school homemaking education.

HEc **560 Family Resource Management** (3 cr) (HEc 546). Management of economic and human resources with focus on family structures in all socioeconomic and age groups. Prereq: HEc 346 or equiv or perm.

HEc **570 Current Concepts in Nutrition** (2 cr). Innovative concepts and techniques in nutrition research; scientific investigations; nutrition problems. Prereq: HEc 470, Zool 119, or equiv.

HEc **583 Recent Trends in Institutional Management** (2 cr). Management principles applied to food service institutions.

HEc **590 Foundations of Home Economics Research** (2 cr). Intro to research design in home economics; frequently used research methods and instrumentation; preparation of a research proposal suitable for thesis.

HEc **597** (s) **Practicum** (cr arr). Prereq: perm.

HEc **598** (s) **Internship** (cr arr). Supervised internship in educational institutions, governmental/social agencies, hospitals, or industry; geared to the educational and vocational goals of students. Prereq: perm.

HEc **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Curricular Requirements

HOME ECONOMICS CORE CURRICULUM

Course	Credits
Three of the following courses	9-10
HEc 105 Individual & Family Development	
HEc 123 Textiles	
HEc 205 Concepts in Human Nutrition	
HEc 346 Family Resource Management or 448 Consumer Education	

CHILD DEVELOPMENT AND FAMILY RELATIONS (B.S.H.Ec. or B.A.)

Required course work includes the university requirements (see regulation J-3); for the B.A., the general L & S requirements for the B.A. degree, including Psych 100; the home economics core (including HEc 105, 205, and 346); and:

Course	Credits
HEc 234 Infancy & Early Childhood	3
HEc 235 Principles & Methods of Child Observation	3
HEc 240 Intimate Relationships	3
HEc 309 Trends & Perspectives in Home Economics	1
HEc 333 Developmental Curriculum for Young Children	3
HEc 334 Middle Childhood-Adolescence	3
HEc 340 Parent-Child Relationships	3
HEc 350 Communicating Home Economics Concepts	3
HEc 436 Theories of Child & Family Development	3
HEc 440 Contemporary Family Relationships	3
HEc 497 Home Economics Practicum	11
Ed 201 Introduction to Teaching	2
H&S 288 First Aid	2
Stat 150 Introduction to Statistics	3
Computer science elective	2-3
Electives to total 132 credits for the degree	—

The CDFR curriculum allows students to develop individualized programs to meet personal and career goals. Consult an adviser. Some suggested career emphasis areas are: (1) human services, (2) education (double major leading to Idaho elementary teaching certification is possible—consult an adviser in the College of Education), (3) aging, and (4) child life.

CLOTHING, TEXTILES, AND DESIGN (B.S.H.Ec.)

Required course work includes the university requirements (see regulation J-3), the home economics core, and:

Course	Credits
HEc 123 Textiles	3
HEc 124 Clothing Construction Principles	3
HEc 229 Introduction to Fashion Industry	3
HEc 309 Trends & Perspectives in Home Economics	1
HEc 314 Weaving	3
HEc 323 Intermediate Textiles	2
HEc 329 Historic Costume	3
Art 101 Visual Art	3
Art 214 Textile Design	3
Art 221 Graphic Design	3
Bus 321 Marketing	3
Bus 325 Retailing	3
Chem 103 Intro to Chemistry or 111 Prin of Chemistry	4
CommG 131 Fundamentals of Public Speaking	2
Econ 151 Principles of Economics	3
Hist 101 or 102 History of Civilization	3
Psych 100 Introduction to Psychology	3
Soc 110 Introduction to Sociology	3
Anthropology elective	3
Art elective or ThA 362, 363, or 410	2-3
Computer science elective	2-3
Required courses from emphasis area	27-32
Electives to total 132 cr for the degree	—

Students, in consultation with an adviser, elect courses from a career emphasis area: apparel design or fashion merchandising. Qualified students may elect to spend their sophomore or junior year at the Fashion Institute of Technology (New York City) or at a participating National Student Exchange School that offers an acceptable program. Specific information is available from CTD advisers.

FOOD AND NUTRITION (B.S.H.Ec.)

Required course work includes the university requirements (see regulation J-3), three courses from the home economics core, and one of the following options.

Note: Courses numbered HEc 363, 364, 385, 472, 473, 486, and 488 are taught at Eastern Washington University, Cheney. EWU is on the quarter system; however, credits are listed here in equivalent semester hours.

Upon acceptance to the professional phase of the CCPD (last two years), students must maintain a cumulative grade-point average of at least 2.70 to remain in and graduate from the program. Students must also obtain at least a B (80%) in all CCPD courses required for membership in the American Dietetic Association.

A. CONSORTIUM COORDINATED PROGRAM IN DIETETICS

Course	Credits
HEc 170 Introductory Foods	3
HEc 271 Food Preparation Principles	3
HEc 361 Advanced Nutrition	4
HEc 362 Introduction to Clinical Dietetics	4
HEc 363 Diet Therapy	4
HEc 364 Clinical Dietetics I	4.6
HEc 384, 385 Food Administration I, II	8
HEc 470 Trends in Nutrition Research	3
HEc 472 Clinical Dietetics II	5.3
HEc 473 Community Nutrition	4
HEc 474 Investigation of Foods	3
HEc 484, 488 Food Systems Management I, II	8
HEc 486 Nutrition in the Life Cycle	2.6
Bact 250 General Microbiology	4
Biochem 380, 382 Introductory Biochemistry & Lab	4
Bus 412 Human Resource Management	3
Chem 103 Intro to Chemistry or 111 Prin of Chemistry	4
Chem 275, 276 Carbon Compounds & Lab	4
CS 100 Introduction to Computers & Programming	3
Econ 151 Principles of Economics	3
Eng 317 Technical & Engineering Report Writing	3
Math 140 Pre-calculus Algebra & Analytic Geometry	3
Psych 100 Introduction to Psychology	3
Soc 110 Introduction to Sociology	3
Stat 251 Principles of Statistics	3
Zool 119 Human Anatomy & Physiology	5
Humanities electives	6

B. FOOD AND NUTRITION RESEARCH

Course	Credits
HEc 170 Introductory Foods	3
HEc 270 Intermediate Foods	3
HEc 470 Trends in Nutrition Research	3
AnSc 305 Animal Nutrition	3
Bact 250 General Microbiology	4
Bact 402 Food & Applied Microbiology	4
Biochem 380, 382 Introductory Biochemistry & Lab	4
Chem 253 Quantitative Analysis	5
Chem 277, 278 Organic Chemistry I & Lab	4
Chem 372, 376 Organic Chemistry II & Lab	5
Math 180 Analytic Geometry & Calculus I	4
Zool 119 Human Anatomy & Physiology	5
Designated electives	15
Electives to total 132 cr for the degree	—

Students who wish to fulfill the requirements for a food science minor should see FN advisers. For a career emphasis in consumer foods, see an adviser in FN or GHEc.

GENERAL HOME ECONOMICS (B.S.H.Ec.)

Required course work includes the university requirements (see regulation J-3), the home economics core (including HEc 105, 123, 205, and 346 or 448), and:

Course	Credits
HEc 309 Trends & Perspectives in Home Economics	1
HEc 350 Communicating Home Economics Concepts	3
Home economics courses, 15 credits of which are at the 300- or 400-level	21

And one of the following options:

A. GENERAL OPTION

Course	Credits
Electives to total 132 cr for the degree	—

B. BUSINESS OPTION

Course	Credits
Acctg 201 Principles of Accounting	3
Acctg 202 Managerial Accounting	3
Bus 301 Financial Management	3
Bus 311 Introduction to Management	3
Bus 321 Marketing	3
Courses chosen from BLaw 265, Bus 325, 361, 403, 413, 415, and 420 (minimum)	6
Electives to total 132 cr for the degree	—

C. COMMUNICATIONS OPTION

Course	Credits
Comm 121 News Writing	3
Comm 140 Mass Media & Society	3
Comm 425 Feature Article Writing	3
Comm 431 Professional Presentation Techniques	3

Courses chosen from Comm 222, 270, 281, 323, 352, and 354 (minimum) 9
Electives to total 132 cr for the degree ..... —

HOME ECONOMICS EDUCATION (B.S.H.Ec.)

Students seeking certification as secondary teachers must meet College of Education requirements for entry into teacher education. These requirements are prerequisite to enrollment in upper-division courses in the College of Education (see Admission to the Teacher Education Program). Students who complete the classroom teaching option are qualified for the Idaho standard secondary teaching certification with vocational home economics endorsement.

Required course work includes the university requirements (see regulation J-3), the home economics core (including HEc 105, 123, 205, 346, and 448), and:

Course	Credits
HEc 124 Clothing Construction Principles	3
HEc 170 Introductory Foods	3
HEc 234 Infancy & Early Childhood	3
HEc 235 Principles & Methods of Child Observation	3
HEc 270 Intermediate Foods	3
HEc 309 Trends & Perspectives in Home Economics	1
HEc 326 Introduction to Housing & Home Furnishings	4
HEc 350 Communicating Home Economics Concepts	3
HEc 356 Experiential & Leadership Programs	1
HEc 440 Contemporary Family Relationships	3
HEc 470 Trends in Nutrition Research	3
AgEd 409 Adult Education, Training & Development	3
Bact 154 Prin of Microbiology or 250 General Microbiology	3-4
Biol 100 Intro to Biology or 201 Intro to the Life Sciences	4
Chem 103 Intro to Chemistry or 111 Prin of Chemistry	4
CommG 131 Fundamentals of Public Speaking	2
Econ 151 or 152 Principles of Economics	3
Psych 100 Introduction to Psychology	3
Soc 110 Introduction to Sociology	3

And one of the following options:

A. CLASSROOM TEACHING

Course	Credits
HEc 357 Supervising FHA & Occupational Home Ec Programs	2
HEc 450 Methods & Curriculum in Home Economics Education	4
HEc 452 Classroom & Lab Management	3
HEc 457 Student Teaching in Home Economics Classes	9
Ed 201 Introduction to Teaching	2
Ed 312 Educational Psychology	2
Ed 340 Methods of Teaching Content Reading	3
VocEd 351 Principles & Philosophy of Vocational Education	2
VocEd 443 Introduction to Special-Needs Education	1
VocEd 453 Task Analysis	1
VocEd 464 Vocational Guidance	3
Electives to total 132 cr for the degree	—

B. COOPERATIVE EXTENSION

Course	Credits
HEc 497 Home Economics Practicum	3-9
AgEd 180 Introduction to Agricultural Education	1
AgEd 359 Developing 4-H Youth Programs	1
AgEd 448 Principles & Practices of Extension Education	3
Computer science elective	2-3
Electives to total 132 cr for the degree	—

HYDROLOGY—see Department of Geology and Geological Engineering

INDUSTRIAL TECHNOLOGY EDUCATION—see Division of Vocational Teacher and Adult Education

Program in Interdisciplinary Studies

Dene K. Thomas, Coordinator, Undergraduate Courses (112 Admin. Bldg.). Jean'ne M. Shreeve, Coordinator, Graduate Courses (114 Morrill Hall).

Interdisciplinary Studies Courses

Inter **101 Freshman Transition Seminar** (2 cr). Development of strategies for setting academic goals and coping with course work; includes study strategies, university orientation, learning styles, purpose of college, career options.

Inter **126 Film and International Culture** (3 cr). Satisfies core requirement J-3-d. Interdisciplinary approach to diversity of modern culture as reflected in film art; comparative study of U.S. and foreign cultures; intro to film history, techniques, and criticism.

Inter **200** (s) **Seminar** (cr arr). Prereq: perm.

Inter **204** (s) **Special Topics** (cr arr).

Inter **299** (s) **Directed Study** (cr arr). Prereq: perm.

Inter **300** (s) **Seminar** (cr arr). Prereq: perm.

Inter **394 Technology and Societal Decisions** (3 cr). See Engr 394.

Inter **399** (s) **Independent Study** (cr arr). Prereq: perm.

Inter **400** (s) **Seminar** (cr arr). Prereq: perm.

Inter **404** (s) **Special Topics** (cr arr).

Inter **438 Pesticides in the Environment** (3 cr). See Ent 438.

Inter **490 Technology and Human Values** (2-3 cr). Ideological and value implications of technology for the future of humans and their environment.

Inter **493-494 Seminar in Urban Studies** (2 cr). Same as Econ 493-494. Interdisciplinary inquiry into problems of communities, physical factors, transportation, communication, housing, planning business and industrial districts, zoning, aesthetics, sociocultural and psychological factors, neighborhoods, local government and finance, urban renewal, regional planning, government program, and dynamics of development; disc led by faculty members and consultants.

Inter **499** (s) **Directed Study** (cr arr). Prereq: perm.

Inter **500 Master's Research and Thesis** (cr arr).

Inter **501** (s) **Seminar** (cr arr). Prereq: perm.

Inter **502** (s) **Directed Study** (cr arr). Prereq: perm.

Inter **503** (s) **Workshop** (cr arr). Prereq: perm.

Inter **504** (s) **Special Topics** (cr arr).

Inter **589 Water Resources Seminar** (1 cr). Same as AgE, CE, Fish, For, Geol, or GeolE 589. Reports by faculty members and grad students on current problems and projects; reports are organized to give maximum interchange of ideas between divisions.

Inter **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Curricular Requirements

INTERDISCIPLINARY STUDIES (B.A. or B.S.)

A student may present a curriculum not included among the ones listed elsewhere in this catalog provided the program is focused toward meeting the student's particular educational goal by combining the offerings of two or more major departments. The program normally is developed and presented during the sophomore year. It must be presented before the end of the second semester of the junior year or at the time when at least 30 credits of the proposed program remain to be taken. It must be approved by: (a) at least one faculty member from each of the participating departments of the university, one of which must be in L & S, (b) the chair of one of the L & S departments involved, and (c) the L & S Committee on Interdisciplinary Studies. University requirements (see regulation J-3) and L & S requirements for either the B.A. or B.S. degree apply. This program requires a minimum of 128 credits, of which at least 50 credits must be in courses numbered 200 or above, including a minimum of 36 credits in courses numbered 300 or above. It is recommended, however, that majors in interdisciplinary studies complete at least 50 credits in upper-division courses.

Interested students should consult the L & S dean's office for referral to the Interdisciplinary Studies Committee for further information about this program.

INTERDISCIPLINARY ACADEMIC MINORS

A student may present a minor curriculum not included among the ones listed elsewhere in this catalog. The program must include at least 24 credits and be approved by: (a) at least one faculty member from each of the participating departments of the university, (b) the chair of one of the departments involved, and (c) in the case of minors that involve a department in the College of Letters and Science, the L & S Committee on Interdisciplinary Studies.

INTERIOR PLANNING AND DESIGN—see Department of Architecture

Program in International Studies

Shaikh M. Ghazanfar, Coordinator (329 Admin. Bldg.). Faculty: Ernest D. Ables, Roy A. Atwood, Guy Carden, Steven R. Chandler, John H. Ehrenreich, Shaikh M. Ghazanfar, John H. Hallaq, Harley E. Johansen, James R. Jones, Michael W. Moody, Alwyn R. Rouyer, Richard B. Spence, Roderick Sprague, Maurice V. Wiese.

International Studies Courses

IS **200; 400** (s) **Seminar** (cr arr). Prereq: perm.

IS **203; 403** (s) **Workshop** (cr arr). Prereq: perm.

IS **204; 404** (s) **Special Topics** (cr arr).

IS **299; 499** (s) **Directed Study** (cr arr). Prereq: perm.

Curricular Requirements

INTERNATIONAL STUDIES (B.A.)

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
Courses to include the following (no more than 15 cr at the lower-div level and no more than 12 cr from any single discipline	39
Anthr 220 Peoples of the World	
Econ 477 Economics of Developing Countries	
Geog 250 World Regional Geography	
IS 400 Seminar: International Issues	
PolSc 237 International Politics	
At least 9 cr from one of the following issue designations: internatl relations, internatl econ and business, global resources and dev (see courses below)	
Optional regional area emphasis: a minimum of 12 cr from one of the regional areas: Latin America, Europe, Asia-Africa, or Canada	
Demonstrated proficiency in a modern foreign language equiv to that gained from six semesters of university study	0-22

In addition, international experience is required for all students in this major. The experience must extend consecutively for at least 10-12 weeks and include an academic project or assignment and immersion in the culture of the country. All costs associated with the international experience are the responsibility of the student. The requirement of international experience may be satisfied by:

a. Academic Experience. Fulfilled by completing a registered credit program such as study abroad, student exchange, student teaching, or internship. In general, credits are registered on the UI campus; course work and field experience are taken abroad.

b. Work Abroad. Fulfilled by completing a noncredit work experience that places the student abroad for a contracted length of time. In general, the work assignment is taken during the degree program.

c. Past Work Abroad. A student who has had previous contracted experience abroad (e.g., Peace Corps), petitions for acceptance. A panel of three faculty members assesses the merits of the experience based on, but not limited to, the following criteria: verification, length, nature, recentness, and relevancy of experience.

Issue Emphases in International Studies

A. INTERNATIONAL RELATIONS
- Geog 365 Political Geography (3 cr)
- Hist 429-430 U.S. Diplomatic History (3 cr each)
- Hist 458 Military History (3 cr)
- PolSc 237 International Politics (3 cr) (reqd for major)
- PolSc 382 Communist Politics (3 cr)
  - PolSc 438 Conduct of American Foreign Policy (3 cr)
- PolSc 440 International Organizations and International Law (3 cr)
- PolSc 449 World Politics and War (3 cr)
- PolSc 487 Political Violence and Revolution (3 cr)

B. INTERNATIONAL ECONOMICS AND BUSINESS
- AgEc 332 Economics of Agricultural Development (3 cr)
- Bus 474 International Business (3 cr)
- Bus 475 International Marketing (3 cr)
- Econ 474 International Economics (3 cr)
- Econ 477 Economics of Developing Countries (3 cr) (reqd for major)
- Econ 490 Comparative Economic Systems (3 cr)

C. GLOBAL RESOURCES AND DEVELOPMENT
- AgEc 332 Economics of Agricultural Development (3 cr)
- For/ResRc/Soc 235 Sociology of Natural Resources (2 cr)
- For 403 WS: International Land Use Planning in Resource Management (cr arr)
- For 420 Tropical Dendrology/Ecology (3 cr)
- For 495 International Wildland Management (1-3 cr, max 3)
- Geog 360 Population Dynamics and Distribution (3 cr)
- PolSc 480 Politics of Development (3 cr)
- Range 358 Natural Resources of the World (3 cr)
- Range 458 Agroforestry (2 cr)
- Range 498 International Wildland Management (1-3 cr, max 3)
- ResRc 492 International Land Preservation Systems (3 cr)
- ResRc 498 International Issues in Nature Conservation (1-3 cr, max 3)

Regional Emphases in International Studies

A. LATIN AMERICA
- FL/EN 394 Latin American Literature in Translation (3 cr)
- FL/SP 384 Hispanic Culture and Institutions (3 cr)
- Hist 435 Latin America: The Colonial Era (3 cr)
- Hist 438 Modern Mexico (3 cr)
- Hist 439 Modern Latin America (3 cr)
- Hist 440 Social Revolution in Latin America (3 cr)
- PolSc 482 Latin American Politics (3 cr)

B. EUROPE
- Eng 341 Survey of British Literature (3 cr)
- FL/EN 313-314 Modern French Literature in Translation (3 cr each)
- FL/EN 323-324 German Literature in Translation (3 cr each)
- FL/EN 393 Spanish Literature in Translation (3 cr)
- FL/FR 303 French Civilization: Institutions (3 cr)
- FL/FR 304 French Culture (3 cr).
- FL/GN 325-326 German Culture and Institutions (3 cr each)
- FL/SP 383 Hispanic Culture and Institutions (3 cr)
- Hist 345 European Christianity, 500-1700 (3 cr)
- Hist 350 European Popular Culture, 1500-1800 (3 cr)
- Hist 366 Intellectual and Cultural History of Modern Europe (3 cr)
- Hist 447 Renaissance Europe (3 cr)
- Hist 449 Reformation Europe (3 cr)
- Hist 451 Age of the French Revolution (3 cr)
- Hist 452 19th Century Europe (3 cr)
- Hist 455 20th Century Europe (3 cr)
- Hist 467 Russia to 1894 (3 cr)
- Hist 468 Russia and Soviet Union Since 1894 (3 cr)
- Hist 469 Modern France (3 cr)
- Hist 470 Germany and Central Europe Since 1815 (3 cr)
- PolSc 381 Politics of Western Europe (3 cr)

C. ASIA-AFRICA
- Anthr 326 Anthropology of China (3 cr)
- Anthr 328 Anthropology of Japan (3 cr)
- Hist 457 History of the Middle East (3 cr)
- Phil 306 Hinduism, Jainism, and Zoroastrianism (3 cr)
- Phil 307 Buddhism (3 cr)
- PolSc 447 Political Systems of East Asia (3 cr)
- PolSc 483 Middle Eastern Politics (3 cr)
- PolSc 484 Politics of India and the Subcontinent (3 cr)
- PolSc 485 African Politics (3 cr)

D. CANADA
- CommG 440 Media and the Canadian Experience (3 cr)
- Geog 362 U.S. and Canada (3 cr)
- Hist 432 The Canadian and American Western Experiences (3 cr)
- Hist 436 Introduction to Canadian History (3 cr)
- Hist 437 Modern Canada (3 cr)
- PolSc 380 Canadian Political System (3 cr)

Comparative World Societies and Cultures
- Anthr 220 Peoples of the World (3 cr) (reqd for major)
- Arch 385-386 History of Architecture (3 cr each)
- Art 301-302 History of Art (3 cr each)
- Eng 441 Introduction to the Study of Language (3 cr)
- Geog 250 World Regional Geography (3 cr) (reqd for major)
- MusH 322-323 Music in Western Civilization (3 cr each)
- Phil 111 World Religions (2-3 cr)
- Soc 324 Comparative Family Systems (3 cr)

Academic Minor Requirements

INTERNATIONAL STUDIES MINOR

In consultation with the International Studies Committee (ISC), students electing this academic minor subject an individual study plan emphasizing (a) international relations, (b) international economics and business, or (c) global resources and development.

1. Basic Credit Requirements. At least 18 credits selected from the list of courses approved by the ISC—including at least nine credits from one of the emphasis areas cited above; six credits from the courses listed in one or more of the other areas or from a list of approved electives from the regional emphasis areas and comparative world societies and cultures; and a three-credit, 400-level seminar in international studies to be taken after fulfilling the other basic requirements (a student normally takes the seminar during the junior or senior year).

2. Limitations. Of the minimum of 18 credits required, (a) not more than six may be at the lower-division level, (b) no more than nine may be in any single discipline, and (c) no more than six may be in the student's major field. No course to be counted toward the minor may be taken by directed study without prior approval by the ISC.

3. Language Proficiency. Demonstrated proficiency (equivalent to that required for the B.A. degree) in a modern foreign language. Students who cannot demonstrate proficiency must complete at least four credits in a modern foreign language, but these credits do not count toward the basic 18-credit requirement.

Department of Landscape Architecture

James J. Kuska, Dept. Chair (102 Art and Arch. Annex). Faculty: Don Brigham, Katherine A. Grinde, James J. Kuska, Toru Otawa.

Landscape architecture is an environmental design and planning profession. It is the art and science of integrating human activities with the natural and urban environment. The profession's objective is to minimize the impact of humans on the natural processes while providing for their physical and psychological needs through design.

As a profession, landscape architecture encompasses certain design skills that enable it to resolve conflicts that arise in the complex interrelationships of physical, economic, political, and social activities of people and their use of the environment. This requires an understanding of the natural systems and visual pattern of the

land, necessitating courses in the natural sciences, such as biology, geology, and soils. In order to understand the nature of the physical, psychological, and social characteristics of mankind, studies in the behavioral and social sciences are extremely important in adapting development to the land. Technical knowledge about site modification is gained through courses in civil engineering and site engineering (landscape construction). This knowledge is balanced with studies in the visual arts to address the needs of people for an aesthetic environment.

The landscape architect's unique expertise lies in the development of a systematic and analytical approach to solving land-use problems. The foundation of the Landscape Architecture Department has been a strong emphasis on this "design process" as a methodology for solving various planning and design problems. The types of projects encountered within the program simulate those in professional practice: residential developments; resource planning; environmental impact assessment; community and historic preservation planning; industrial, institutional, and commercial planning; transportation and utility planning; landscape restoration and reclamation; aesthetic and visual resource management; river and shoreline planning; parks and recreation planning; site energy planning; and computer land planning.

The faculty members and students in the program have access to powerful Geographic Information Systems, visual simulation and CADD computer programs, and an interactive video system that makes this one of the leading departments in landscape architecture in terms of computing capabilities. The faculty members have agreed to use the computer in some way in each landscape architecture course they teach, assuring that students will be computer literate upon graduation.

Landscape architecture students are required to take part in two major field trips at their own expense as partial fulfillment of the program requirements. In addition, one-day or overnight trips are a common occurrence as part of individual classes.

The Department of Landscape Architecture is housed with the interrelated professions of art, architecture, and interior design in the College of Art and Architecture. The department offers a professional four-year program leading to the degree of Bachelor of Landscape Architecture. The department's program is fully accredited by the American Society of Landscape Architects.

Landscape Architecture Courses

LArch **100 Computer Applications in Landscape Arch** (2 cr). Exploration of software that can be used by landscape architecture students via microcomputers; areas include MS-DOS, word processing, desktop publishing, paint programs, construction programs, visual imaging, and computer-aided design (CADD and LandCADD). Two lec and two hrs of lab a wk.

LArch **200** (s) **Seminar** (cr arr). Prereq: perm.

LArch **203** (s) **Workshop** (cr arr). Prereq: perm.

LArch **204** (s) **Special Topics** (cr arr).

LArch **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

LArch **247 Landscape Graphics** (3 cr). Development of techniques and skills in various media used in preparation of landscape architecture graphic presentations both in plan and perspective renderings. Selected field trips at student expense. Prereq: LArch major or perm.

LArch **259 Landscape Architecture I** (6 cr). Intro to landscape architecture planning and design methods and processes (research, analysis, synthesis) applied to small scale pedestrian spaces such as parks, plazas, and courtyards; presentation techniques (graphic and verbal) are emphasized. Selected field trips at student expense. Prereq: Art 121-122.

LArch **260 Landscape Architecture I** (6 cr). Integration and application of principles acquired in plant materials, grading, and drainage, and in LArch 259 to small scale planning and design projects. Selected field trips at student expense. Prereq: LArch 259.

LArch **270 Landscape Construction I** (4 cr). Grading and drainage, earthwork planimeter computations, cut and fill, storm sewer design, and road layout (horizontal/vertical curves). Selected field trips at student expense. Prereq: LArch major or perm.

LArch **288 Plant Materials** (3 cr). Plant identification and selection; use of plant materials in relation to soils, topography, and climate; analysis of design principles in relation to plant compositions. Selected field trips at student expense.

LArch **WS289 History of Landscape Architecture** (3 cr). WSU L A 260.

LArch **299** (s) **Directed Study** (cr arr). Prereq: perm.

LArch **ID358 Professional Office Practice in Landscape Architecture** (2 cr). WSU L A 480. Office organization, fees, contracts, bonding, bidding specifications, insurance, and relationships with subcontractors.

LArch **359 Landscape Architecture II** (6 cr). Intermediate scale planning and design problems that emphasize the analysis, development, and presentation of solutions for urban, rural, and regional housing and recreation projects; intro of sr critique project due in LArch 460; common project done with Dept of Architecture. Selected field trips at student expense. Prereq: LArch 260, Larch 270 or perm.

LArch **360 Landscape Architecture II** (6 cr). Intermediate scale land planning and urban design projects that emphasize the various aspects of the urban environment such as central business districts, malls, housing development, and circulation systems with application of visual analysis techniques; problem solving incorporating use of plant materials is stressed. Common project done with Dept of Art. Selected field trips at student expense. Prereq: LArch 359.

LArch **371 Landscape Construction II** (4 cr). Study of landscape construction methods and materials as applied in the development and design of site elements such as lighting, retaining walls, paving, and decks; construction details and specifications. Selected field trips at student expense. Prereq: LArch major or perm.

LArch **385 GIS Primer** (3 cr). Same as Geog 385. Intro to basic concepts and applications of geographic information systems (GIS), lab exercises on PC-based GIS package, and guest lecturers from industry and governmental agencies. Three hrs of lec-lab a wk.

LArch **387 Park and Recreation Planning** (3 cr). Landscape architecture approach to recreation planning for national, regional, state, city, and neighborhood park systems; application of design principles to provide the experiences desired by the users in such areas.

LArch **388 Plant Materials** (4 cr). Continuation of LArch 288 with emphasis on plant design projects as they relate to small or large scale public and private use areas. Common project done with program in interior design. Selected field trips at student expense. Prereq: LArch 288.

LArch **400** (s) **Seminar** (cr arr). Prereq: perm.

LArch **403** (s) **Workshop** (cr arr). Prereq: perm.

LArch **404** (s) **Special Topics** (cr arr).

LArch **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

LArch **459 Landscape Architecture III** (6 cr). Various scale design projects, including preparation of contract documents. Selected field trips at student expense. Prereq: LArch 360, LArch 371 or perm.

LArch **460 Landscape Architecture III** (6 cr). Student critique of a professional landscape architecture office project; completion of terminal project(s) comprehensive in scope, demonstrating mastery in areas of land planning and/or design, plant materials, construction, and graphics. Selected field trips at student expense. Prereq: LArch 459.

LArch **490 Computer-Aided Regional Landscape Planning** (3 cr). Open to all majors. Study of techniques and methods for regional-scale landscape planning using a state-of-the-art geographic information system (GIS); application of ecological principles and land use analysis; emphasis on use of GIS as tool for landscape planning and management. Prereq: LArch 385 or Geog 385.

LArch **499** (s) **Directed Study** (cr arr). Prereq: perm.

Curricular Requirements

LANDSCAPE ARCHITECTURE (B.L.Arch.)

On registering for a studio course offered in the department, the student agrees that the department may retain work completed by the student.

Note: A 2.00 average must be maintained in all landscape architecture courses in order to remain in good standing in the department.

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
LArch 100 Computer Applications in Landscape Architecture	2
LArch 247 Landscape Graphics	3
LArch 259-260 Landscape Architecture I	12
LArch 270, 371 Landscape Construction I-II	8
LArch 288, 388 Plant Materials	7
LArch 289 History of Landscape Architecture	3
LArch 358 Professional Office Practice, LA	2
LArch 359-360 Landscape Architecture II	12
LArch 385 GIS Primer	3
LArch 459-460 Landscape Architecture III	12
Arch 483 Introduction to City Planning	3
Art 101 Visual Art	3
Art 111-112 Drawing I	4
Art 121-122 Visual Communication & the Design Process	6
Biol 201 Introduction to the Life Sciences	4
Biol 203 General Botany	4
Biol 331 General Ecology	3
CE 218 Elementary Surveying	2
Geol 101, 102 Physical Geology & Lab	4
Math 140 Pre-calculus Algebra & Analytic Geometry	3
Soils 205 General Soils	3
Electives to total 133 cr for the degree, of which at least 6 cr must be from psych and/or soc and 6 cr must be from at least two of the following	

fields: art, anthro, econ, geog, hist, phil, polsc, theatre arts, music, interdisciplinary studies, English, and forestry.....—
Recommended elective:
Geol 335 Geomorphology
LArch 299: DS: Irrigation
LArch 490 Computer-Aided Regional Landscape Planning

LATIN—See Department of Foreign Languages and Literatures

Program in Latin American Studies

Judith L. Sweeney (305-A Admin. Bldg.) and Dennis D. West (332-A Admin. Bldg.), Coordinators. Faculty: Alfred W. Jensen, Richard M. Keenan, Michael W. Moody, Judith L. Sweeney, Dennis D. West, Daniel G. Zirker.

The program in Latin American studies is a multidisciplinary major leading to the B.A. degree. The appeal of this field of study has greatly increased over the last decade, due to the region's growing economic and political importance. A degree in the major is appropriate for employment in many fields, among which are the diplomatic service and overseas business as well as graduate study in various disciplines. Students electing the major will also broaden their awareness of non-Western cultures and history.

Curricular Requirements

LATIN-AMERICAN STUDIES (B.A.)

Required course work includes the university requirements (see regulation J-3), the general requirements for the B.A. degree, including Spanish for the foreign language requirement, and:

Course	Credits
FL/SP 384 Hispanic Culture & Institutions	3
FL/SP 387-388 Survey of Spanish-American Literature or 487-488 Contemporary Spanish-American Literature	6
Hist 435 Latin America: The Colonial Era	3
Hist 438 Modern Mexico or 439 Modern Latin America	3
And at least seven of the following courses (or the optional courses listed above)	21
*Econ 477 Economics of Developing Countries	
FL/EN or FL/SP 391 Hispanic Film	
FL/EN 394 Latin American Literature in Translation	
FL/SP 386 Survey of Spanish Literature	
FL/SP 404 Special Topics (with prior approval of program coordinator)	
Hist 210 Introduction to Modern Latin American History	
Hist 440 Social Revolution in Latin America	
*PolSc 482 Latin American Politics	

*Students are strongly urged to elect those courses marked with an asterisk and to take Hist 101-102 (History of Civilization) in their freshman year.

College of Law

Sheldon A. Vincenti, Dean (101 Law Bldg.); Arthur D. Smith, Jr., Associate Dean. Faculty: Mark D. Anderson, D. Benjamin Beard, Elizabeth B. Brandt, James R. Carlson, Dennis C. Colson, Neil E. Franklin, Ruth P. Funabiki, Kenneth S. Gallant, Dale D. Goble, Douglas L. Grant, Joann P. Henderson, D. Craig Lewis, Monique C. Lillard, James S. Macdonald, John A. Miller, Myron A. Schreck, Leinaala R. Seeger, Arthur D. Smith, Jr., Sheldon A. Vincenti.

For additional information on the College of Law, see part 4 and the announcement of the College of Law.

Law Courses

For complete descriptions of the courses in this section (other than Law 511), see the annual announcement of the College of Law. Registration by non-law students in any course offered by the College of Law requires permission in advance by the associate dean and the instructor of the course.

Law **501** (s) **Seminar** (1-3 cr, max arr). For non-law grad students.

Law **ID511 Legal Process** (3 cr). WSU ES/RP 511. Not open to J.D. candidates for cr toward the degree; will ordinarily be confined to grad students and srs with superior academic records. Designed to acquaint non-law student with legal process in general and role of the judiciary in natural resource management in particular; provide non-law grad students with sufficient legal research, writing, and reasoning skills to enroll in regular law courses.

Law **805 Introduction to Law** (2 cr).

Law **806 Procedure** (4 cr).

Law **807-808 Property I-II** (3 cr).

Law **809-810 Torts I-II** (3 cr; 2 cr).

Law **811 Constitutional Law I: Fundamentals** (2 cr).

Law **812 Criminal Law** (3 cr).

Law **813-814 Contracts I-II** (3 cr).

Law **815 Legal Research and Writing** (3 cr).

Law **901** (s) **Seminar** (cr arr).

Law **904 Federal Courts** (3 cr).

Law **905 Constitutional Law II: Individual Rights** (4 cr).

Law **907 Administrative Law** (3 cr).

Law **908 Introduction to the Law of the Workplace** (4 cr).

Law **909 Energy Law** (3 cr).

Law **910 Antitrust and Trade Regulation** (3 cr).

Law **915 International Business Transactions** (3 cr).

Law **919 Business Associations I** (4 cr).

Law **920 Business Associations II** (3 cr).

Law **921 Basic Legal Acctg** (1 cr).

Law **922 Unfair Competition** (2 cr).

Law **923 Negotiable Instruments, Bank Collections and Deposits, and Other Payment Systems** (3 cr).

Law **924 Sales** (3 cr).

Law **925 Creditors' Rights and Secured Transactions** (3 cr).

Law **926 Bankruptcy** (3 cr).

Law **927 Seminar, Business Planning** (3 cr).

Law **930-931 Taxation I-II** (4 cr; 3 cr).

Law **932 Estate Planning** (3 cr).

Law **941 Wills, Estates, and Trusts** (3 cr).

Law **942 Water Law** (3 cr).

Law **943 Real Estate Finance and Tax Planning** (3 cr).

Law **944 Local Government and Land Use Law** (3 cr).

Law **945 Community Property** (2 cr).

Law **946 Legal Problems in Agriculture** (3 cr).

Law **947 Seminar, Environmental Law** (3 cr).

Law **948 Seminar, Public Land Resources Law** (3 cr).

Law **949 Indian Law** (3 cr).

Law **950 Evidence** (3 cr).

Law **952 Remedies** (3 cr).

Law **953 Criminal Procedure** (3 cr).

Law **954-955 Practice Court I-II** (3 cr).

Law **956 Appellate Court** (1-2 cr).

Law **957 Insurance** (3 cr).

Law **958 Products Liability** (3 cr).

Law **960 Conflict of Laws** (2 cr).

Law **961 Seminar, Jurisprudence** (2 cr).

Law **962 Professional Responsibility** (2 cr).

Law **963 Family Law** (3 cr).

Law **971 Lawyering Process Seminar** (2 cr).

Law **972 Legal Externship** (1 cr).

Law **973 Public Agency Externship** (10 cr).

Law **974 Legal Aid Internship** (5 cr; 3 cr).

Law **982 Law Review** (1-4 cr, max 4).

Law **983 Legal Research** (1-2 cr, max 4).

LIBRARY SCIENCE—see Division of Teacher Education

Martin Institute for Peace Studies and Conflict Resolution

Joel R. Hamilton, Interim Director (1 Cont. Educ. Bldg.).

The Martin Institute for Peace Studies and Conflict Resolution is a multidisciplinary center at the University of Idaho, founded in the belief that war and violence are neither necessary nor inevitable. Its purposes are to encourage education and research to advance peace and to resolve local and regional conflicts with alternatives to confrontation and litigation. Institute scholars seek to understand the major causes of disputes and violence and to provide information, training, and assistance for the resolution of conflicts. The institute brings together scholars, students, and present and future leaders to develop the knowledge needed for the on-going and new challenges of establishing peace as a basis for long-range social and economic progress.

Martin Institute Courses

Mrtn **490 The Causes of War** (3 cr). Scientific analysis of the causes of the major wars since World War I. Cr not granted for both Mrtn 490 and PolSc 449.

Mrtn **491 Political, Social, and Economic Conflict Resulting in Violence** (3 cr). Nature and dynamics of social and econ forces resulting in political conflict strategies; threats and bargaining; resort to violence and conflict resolution. Cr not granted for both Mrtn 491 and PolSc 487.

Mrtn **492 Terrorism: Threat, Reality, and Response** (3 cr). The terrorist arsenal, national disruption terrorism, countermeasure technology, incident mgt, prep for emergencies, potential targets, and patterns for negotiation.

Mrtn **495 Technical Aspects of Modern Warfare** (3 cr). Intro to nuclear arms, radiation effects, lasers, missiles, weapons in space, biol and chem weapons, telemetry and comm; use of strategic nuclear arms; disarmament strategies, verification of arms control; relation to energy resources and peaceful uses of technology.

Mrtn **496 International Organizations and International Law** (3 cr). See PolSc 440.

Mrtn **WS523 International Organization and Administration** (3 cr). WSU Pol S 423/523.

Mrtn **596 Seminar in Political Violence** (3 cr). Comparative analysis of causes of revolutionary upheaval and other forms of violent civil conflict; methods and approaches to study of political violence.

Department of Mathematics and Statistics

Clarence J. Potratz, Dept. Chair (300 Carol Ryrie Brink Hall).

Mathematics Faculty: Gail H. Adele, Erol Barbut, Arie Bialostocki, Larry E. Bobisud, Willy Brandal, James E. Calvert, Jr., Charles O. Christenson, John I. Cobb, Paul F. Dierker, Roy H. Goetschel, Jr., Michael R. Kelly, Mark J. Nielsen, Ralph J. Neuhaus, Clarence J. Potratz, William D. Royalty, Mary H. Voxman, William L. Voxman.

Statistics Faculty: C. Randall Byers, Brian C. Dennis, Dale O. Everson, Philip D. Olson, Clarence J. Potratz, Kumarasiri Samaranayake, R. Kirk Steinhorst. Adjunct Faculty: Raymond Dacey, Edward O. Garton, Donald F. Haber, Joel R. Hamilton.

The Department of Mathematics and Statistics offers a wide variety of majors and minors. In addition to the degree programs described below, many students pursue joint majors in mathematics and other disciplines that utilize mathematics. The most popular of these are mathematics/computer science and mathematics/physics. A joint major is obtained by completing the degree requirements for both majors. Minor programs are described below under "Curricular Requirements." At the graduate level, the department offers the M.S., M.A.T., and Ph.D. in mathematics and the M.S. in statistics. Detailed information on these programs is published in the *Graduate Bulletin.*

The need for persons with quantitative skills is increasing dramatically as the world grows more complex. Mathematicians and statisticians have employment opportunities in business, industry, government, and teaching. Persons planning careers in almost any field will find their opportunities enhanced by the study of mathematics and statistics. The programs are intended to provide students just such enhancement. It is generally the case that the person who develops his or her quantitative skills has increased ability to attack many of the complex problems of society. Advances in science, technology, the social sciences, business, industry, and government become more and more dependent on precise analysis and the extraction of information from large quantities of data. Environmental problems, for example, require careful analysis by persons (or teams of persons) with skills in mathematics, statistics, and computer science as well as in biology, geology, physics, and many other fields.

The demand for teachers of mathematics is greater now than ever before. Nearly every school district in the nation has a shortage of teachers trained in mathematics. UI offers a broadly based program leading to teacher certification, through enrollment either in the Department of Mathematics and Statistics or in the College of Education and completion of a major or minor in mathematics.

Mathematics. The body of mathematical knowledge that has grown over the past 2,000 years is a magnificent human achievement, and it is growing more rapidly than ever before. The habits of systematic and creative thought developed in the study of mathematics are recognized as invaluable in most areas of human endeavor. UI's B.A. and B.S. programs in mathematics are designed to introduce the student to the excitement of mathematical ideas; they allow the maximum possible freedom to explore those areas of mathematics that the student finds most interesting.

The department has a sound program in mathematics with a proven record of preparing students for successful graduate study at the very best universities in the nation. There are sequences of courses in calculus, advanced calculus, linear algebra, differential equations, number theory, abstract algebra, topology, geometry, statistics, complex analysis, and mathematical analysis. Students of mathematics who do not go to graduate school are well prepared for industrial, governmental, or teaching jobs if they have some additional exposure to computer science, education, or one of the natural, social, or applied sciences.

Applied Mathematics. Many of the greatest achievements in mathematics were inspired by problems in the natural sciences; today mathematics has wide application in both the natural and social sciences. Applied mathematics provides a broad arena for intellectual and creative impulses of people. The B.S. in applied mathematics allows a choice of the computation, statistics, scientific, or actuarial science options. Many students interested in applications of mathematics pursue a joint major in some other department.

Actuarial Science. An actuary applies mathematics and statistics to forecasting problems. Actuaries are employed by financial institutions, government, insurance companies, and international corporations. They address problems as diverse as economic fluctuations, population demographics, resource consumption, medical insurance rates, and retirement needs. Actuaries are in great demand and have many interesting career opportunities leading often to high management positions. Admission to the actuarial profession is governed by a series of examinations administered by the actuarial societies. The first two or three examinations can be taken by undergraduates, and the rest are usually taken while working in the industry. The first three examinations are given locally. Our actuarial science option, review seminars, and summer internship program with actuarial companies prepare students for these tests.

Statistics. Statistics encompasses course work in designing and analyzing experiments, planning and interpreting surveys, and exploring relationships among variables observed on social, physical, and biological phenomena. The applied nature of the program allows the student to develop data analysis tools for such diverse areas as business and economics, crop and animal production, biological sciences, human behavior, education, engineering, and natural resource management. The statistics program thus serves to support major programs in other disciplines. Within the department, a statistics option is available under applied mathematics leading to a baccalaureate degree, and an M.S. degree in statistics is offered at the graduate level.

Faculty members in the Department of Mathematics and Statistics will be happy to answer questions about specific programs and courses. Such questions can also be addressed to the department chair (Brink 300; telephone 208/885-6742).

Courses

MATHEMATICS

ADVANCED PLACEMENT: Courses in this subject field that are vertical in content are: Math 180-190-200-471-472.

CREDIT LIMITATIONS: Math 120 and 140 carry no credit after 160 or 180; Math 180 carries 2 credits after 160; Math 160 carries no credit after 180.

Also see regulation J-5-e.

Math **050 Pre-college Algebra** (0 cr). Review of arithmetic and intro to algebra, including factoring, rational expressions, exponents, radicals, and systems of linear equations. Three lec a wk. A special fee is charged for this course.

Math **101 The Spirit of Mathematics** (3 cr). Satisfies core requirement J-3-c. For students who are curious about what mathematics is and what mathematicians do but who do not plan to use mathematics as a tool in their careers; discussion of some aspects of mathematics through study of problems of "applied" and of "pure" type, taken from areas such as number theory, geometry, topology, probability, and combinatorics; discussion of the historical development.

Math **111 Finite Mathematics** (4 cr). Satisfies core requirement J-3-c. Systems of linear equations and inequalities, matrices, linear programming, and probability. Prereq: 1 yr high school algebra, 1 yr plane geometry, and sufficient score on SAT, ACT, or Math Placement Test.

Math **120 Intermediate Algebra** (3 cr). May be taken for cr after Math 111. Review of elementary algebra, quadratic equations, systems of linear equations, graphing, functions, and logarithms. Prereq: 1 yr high school algebra, 1 yr high school plane geometry, and sufficiently high score on SAT, ACT, or Math Placement Test; or Math 050.

Math **135-136 Mathematics for Elementary Teachers** (3 cr) (C). Mathematical development of arithmetic, informal geometry, problem solving, probability and statistics as these subjects are currently taught in elementary schools. Prereq: 2 yrs high school algebra (or Math 140), 1 yr plane geometry, and placement by test; recommended preparation for Math 135: general education requirement in mathematics (Math 111, 140, 160, or 180).

Math **140 Pre-calculus Algebra and Analytic Geometry** (3 cr) (C). Satisfies core requirement J-3-c. Carries no credit after Math 180. Algebraic, exponential, logarithmic functions; graphs of conics; zeros of polynomials; systems of equations, induction. Prereq: 1-1/2 yrs high school algebra, 1 yr high school plane geometry, and sufficiently high score on SAT, ACT, or Math Placement Test; or Math 120.

Math **160 Survey of Calculus** (4 cr). Satisfies core requirement J-3-c. Carries no credit after Math 180. Functions, graphing, derivative, integral, exponential and logarithmic functions, functions of several variables. Prereq: One yr of high school geometry and one of the following: (1) 1-1/2 yrs high school algebra and sufficiently high score on SAT, ACT, or Math Placement Test or (2) Math 120 or (3) Math 140.

Math **176 Discrete Mathematics** (4 cr). Basic set theory, matrices, graph theory, number systems, Boolean algebra, and difference equations; emphasis on algorithms and intro to their analysis. Prereq: two yrs high school algebra and sufficiently high score on SAT, ACT, or Math Placement Test; or Math 140.

Math **179 Analytic Trigonometry** (2 cr) (C). Not open for cr to students who have previous high school or college cr in trigonometry. Trigonometric functions, inverse functions, applications. Prereq: 2 yrs high school algebra (or Math 120 or 140) and 1 yr plane geometry, and perm of dept. Concurrent enrollment in Math 120, 140, or 180 permitted.

Math **180 Analytic Geometry and Calculus I** (4 cr) (C). Satisfies core requirement J-3-c. Carries 2 credits after Math 160. Functions, limits, continuity, differentiation, integration, application, differentiation and integration of transcendental functions. Prereq: 2 yrs high school algebra (or Math 140), 1 yr plane geometry, 1/2 yr analytic trigonometry, and sufficiently high score on SAT, ACT, or Math Placement Test.

Math **R181 Analytic Geometry and Calculus I** (3 cr). Functions, rate of change, limits, continuity, differentiation of algebraic functions with application, and integration. Prereq: perm.

Math **190 Analytic Geometry and Calculus II** (4 cr). Differentiation and integration of transcendental functions, integration techniques, general mean value theorem, numerical techniques, and series. Prereq: Math 180.

Math **R191 Analytic Geometry and Calculus II** (3 cr). Application of the definite integral, differentiation and integration of transcendental functions, methods of integration, and determinants and linear equations. Prereq: perm.

Math **200 Analytic Geometry and Calculus III** (3 cr). Vectors, functions of several variables, and multiple integration. Prereq: Math 190.

Math **R201 Analytic Geometry and Calculus III** (3 cr). Two- and three-dimensional analytic geometry, vectors, hyperbolic functions, parametric equations, and polar coordinates. Prereq: perm.

Math **202** (s) **Seminar** (cr arr). Prereq: perm.

Math **204** (s) **Special Topics** (cr arr).

Math **R211 Analytic Geometry and Calculus IV** (3 cr). Partial derivatives, infinite series, and complex numbers and functions. Prereq: perm.

Math **215 Seminar in Topology of the Plane** (3 cr). Carries no credit after Math 411 or 471. Primary goal is to teach students to prove theorems; open and closed sets, connectedness, compactness, continuity, etc. Class size limited to 15. Prereq: Math 180, 190, and perm.

Math **255 Applied Actuarial Science I** (0 cr). Review of calculus and linear algebra in preparation for actuarial exam 1. Prereq: Math 200, 330.

Math **286 Theory of Numbers** (3 cr). Elementary number theory, including divisibility properties, congruences, and Diophantine equations. Prereq: Math 140 or perm.

Math **299** (s) **Directed Study** (cr arr). Prereq: perm.

Math **310 Ordinary Differential Equations** (3 cr). Classification, initial and boundary value problems of one variable, exact equations, methods of solving higher-order linear equations, second-order equations with constant coefficient, series solutions, systems of linear equations, Laplace transforms, and existence theorems. Prereq: Math 190 (200 recommended).

Math **H315 Topics in Pure Mathematics** (3 cr). Carries no credit after Math 215. A topic selected each yr that develops skill and appreciation for theoretical nature of mathematics. Prereq: Math 160 or 180 and perm of director of University Honors Program.

Math **H316 Topics in Applied Mathematics** (3 cr). Topics selected each yr that develop skill in and appreciation for application of mathematics. Prereq: Math 200 and perm of director of University Honors Program.

Math **326 Linear Programming** (3 cr). Geometric solutions, simplex method, duality and revised simplex method, sensitivity, integer programming, appl. Prereq: Math 160 or 180.

Math **330 Linear Algebra** (3 cr). Linear equations, matrices, linear transformations, eigenvalues, diagonalization; applications. Prereq: Math 160 or 180.

Math **346 Applied Combinatorics** (3 cr). Elementary counting methods, generating functions, recurrence relations, Polya's enumeration, enumeration of graphs, trees, searching, combinatorial algorithms. Prereq: Math 190; recommended prereq: Math 176 or 376 or 405.

Math **376 Discrete Mathematics II** (3 cr). Selected topics from discrete mathematics such as graph theory, modeling, and optimization. Prereq: Math 176 or perm.

Math **390 Postulational Geometry** (3 cr). Postulates of Hilbert and Euclid; non-Euclidean geometries; the Erlanger program; projective geometry. Prereq: Math 180 or 160.

Math **400** (s) **Seminar** (cr arr). Prereq: perm.

Math **404** (s) **Special Topics** (cr arr). Prereq: perm.

Math **405 Analysis of Algorithms** (3 cr). Same as CS 495. Measures of efficiency; standard methods and examples in the design and analysis of algorithms. Prereq: CS 213 and either Math 160 or 180.

Math **411 Elementary Topology** (3 cr). Alt/yrs. Metric spaces; topological spaces; compactness; connectedness, continuity. Prereq: Math 200 or perm.

Math **420 Complex Variables** (3 cr). Alt/yrs. Complex numbers, elementary functions, derivatives, the residue theorem, conformal mappings, contour integration, infinite series, applications. Prereq: Math 200.

Math **426 Optimization** (3 cr). Classical optimization, convexity, one-dimensional searches, nonlinear programming, numerical considerations. Prereq: Math 200, 330, 326, and knowledge of a computer language.

Math **432 Numerical Linear Algebra** (3 cr). Analysis of efficiency and accuracy of large linear algebra problems; special emphasis on solving linear equations and finding eigenvalues. Prereq: Math 200, 330, and knowledge of a computer language.

Math **433 Numerical Analysis** (3 cr). Analysis of numerical methods useful in solving applied problems; solution of nonlinear equations, interpolation, numerical differentiation and integration, numerical solution of differential equations. Prereq: Math 200, 330, and knowledge of a computer language.

Math **440 Linear Algebra** (3 cr). Vector spaces, linear transformations and matrices, quadratic forms, characteristic vectors and roots.

Math **ID&WS451-ID&WS452 Probability Theory and Mathematical Statistics** (3 cr). Same as Stat 451-452. WSU Stat 443-444. Random variables, limit theorems, distribution of sample statistics, estimation, testing hypotheses. Prereq: Math 200.

Math **ID&WS-J453/ID&WS-J544 Stochastic Models** (3 cr). Same as Stat J453/J544. WSU Stat 544. Alt/yrs. Markov chains, stochastic processes, and other stochastic models; applications. Additional projects/assignments reqd for grad cr. Prereq: Math 451 or perm.

Math **461-462 Abstract Algebra** (3 cr). Groups, rings, and fields. Recommended prereq for Math 461: at least one of the following: Math 215, 286, 330, 390.

Math **WS464 Operations Research and Game Theory** (3 cr). WSU Math 464.

Math **471-472 Advanced Calculus** (3 cr). Topology of Euclidean n-space, limit and continuity, differentiation, integration. Prereq: Math 200 and 215, or perm.

Math **480 Partial Differential Equations** (3 cr). Alt/yrs. Intro to Fourier analysis, application to solution of partial differential equations; classical partial differential equations of engineering and physics. Prereq: Math 310.

Math **482 Advanced Applied Mathematics** (3 cr). Selected topics. Prereq: Math 310.

Math **485 Theory of Computation** (3 cr). Same as CS 490. Mathematical models of computation, including finite automata and Turing machines. Prereq: perm.

Math **490 Introduction to Set Theory** (3 cr). Alt/yrs. Set operations, functions, binary operations and relations, cardinal and ordinal numbers, axiom of choice, partially ordered sets, and Zorn's lemma. Prereq: Math 200.

Math **498 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm of dept.

Math **499** (s) **Directed Study** (cr arr). Prereq: perm.

Math **500 Master's Research and Thesis** (cr arr).

Math **501** (s) **Seminar** (cr arr). Prereq: perm.

Math **502** (s) **Directed Study** (cr arr). Prereq: perm.

Math **504** (s) **Special Topics** (cr arr).

Math **WS507 Advanced Theory of Numbers** (3 cr, max 6). WSU Math 507.

Math **WS508 Topics in Applied Analysis** (3 cr). WSU Math 508.

Math **WS509 Foundations of Mathematics** (3 cr). WSU Math 509. Alt/yrs.

Math **ID&WS511-ID&WS512 Topology** (3 cr). WSU Math 525-526. Alt/yrs. Basic concepts of point set and algebraic topology.

Math **521** (s) **Seminar in Topology** (1-3 cr, max arr). Current lit.

Math **ID523-ID524 Algebraic Topology** (3 cr). WSU Math 527-528. Alt/yrs. Basic homotopy theory, covering spaces, homology theory, and applications.

Math **526** (s) **Topics in Topology** (1-3 cr, max 12).

Math **ID&WS531-532 Complex Variables** (3 cr). WSU Math 503. Alt/yrs. Theory of functions of a complex variable.

Math **535 Real Variables** (3 cr). Alt/yrs. Measure and integration theory for functions of one or several variables.

Math **536 Probability Theory** (3 cr). Alt/yrs. Random variables, characteristic functions, convergence theorems, central limit theorem, conditional probability, and stochastic processes as developed from a measure theoretic basis. Prereq: Math 535 or perm.

Math **ID&WS539 Theory of Ordinary Differential Equations** (3 cr). WSU Math 512. Alt/yrs. Existence, uniqueness, and stability of solutions of first-order systems; other topics.

Math **WS540 Partial Differential Equations I** (3 cr). WSU Math 540.

Math **ID&WS541A** (s) **Seminar in Analysis** (1-3 cr, max arr). WSU Math 581. Current lit.

Math **WS541B Partial Differential Equations II** (3 cr). WSU Math 541.

Math **ID&WS544 Stochastic Models** (3 cr). See Math J453/J544.

Math **WS545 Numerical Analysis of Evolution Equations** (3 cr). WSU Math 545.

Math **546** (s) **Topics in Analysis** (1-3 cr, max arr).

Math **ID550A Linear Algebra** (3 cr). WSU Math 554. Alt/yrs. Vector spaces, direct sums, quotient spaces, similarity, Jordan forms, inner products, eigenvalues, eigenvectors, spectral theory.

Math **WS550B Advanced Topics in Geometry** (3 cr). WSU Math 550. Alt/yrs.

Math **ID551 Ring Theory** (3 cr). WSU Math 553. Alt/yrs. Ideals, quotient rings, modules, radicals, semisimple Artinian rings, Noetherian rings.

Math **ID552 Galois Theory** (3 cr). WSU Math 552. Alt/yrs. Field extensions, automorphisms, normality, splitting fields, radical extensions, finite fields, separability. (A knowledge of group theory is presumed.)

Math **553 Group Theory** (3 cr). Alt/yrs. Permutation groups, isomorphisms, direct products, Sylow theory, normal series, abelian groups.

Math **ID&WS561** (s) **Seminar in Algebra** (1-3 cr, max arr). WSU Math 582. Current lit.

Math **WS564 Topics in Optimization** (3 cr, max arr). WSU Math 564.

Math **566** (s) **Topics in Algebra** (1-3 cr, max arr).

Math **WS570 Mathematical Foundations of Continuum Mechanics I** (3 cr). WSU Math 570.

Math **ID&WS571A-ID&WS572 Functional Analysis** (3 cr). WSU Math 504-506. Alt/yrs. Linear topological spaces and linear operators. Prereq: Math 536.

Math **WS571B Mathematical Foundations of Continuum Mechanics II** (3 cr). WSU Math 571.

Math **574 Topics in Applied Mathematics** (3 cr). Integral and differential equations.

Math **R577-R578 Advanced Mathematical Statistics** (3 cr). Development and application of mathematical statistics to problems in the engineering sciences. Prereq: perm.

Math **R580 Numerical Solutions of Partial Differential Equations** (3 cr). Finite difference methods for elliptic, parabolic, and hyperbolic equations; solution methods suitable for digital computers; iterative methods for large scale linear systems. Prereq: perm.

Math **581** (s) **Seminar in Combinatorics** (1-3 cr, max arr).

Math **582** (s) **Topics in Combinatorics** (1-3 cr, max arr).

Math **WS583 Topics in Applied Mathematics** (3 cr, max arr). WSU Math 583.

Math **WS584 Seminar in Topology and Geometry** (3 cr, max arr). WSU Math 584.

Math **585A-586A Recent Developments in Mathematics** (3 cr). For students with extensive background in specific phases.

Math **WS585B Seminar in Number Theory** (3 cr, max arr). WSU Math 585. Alt/yrs.

Math **WS586B Topics in Mathematical Modeling in Natural Sciences** (3 cr, max 12). WSU Math 586.

Math **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Math **600 Doctoral Research and Dissertation** (cr arr).

STATISTICS

CREDIT LIMITATIONS: Credit is not given for both Stat 251 and 301.

Stat **150 Introduction to Statistics** (3 cr). Satisfies core requirement J-3-c. Intro to statistical reasoning with emphasis on examples and case studies; topics include design of experiments, descriptive statistics, measurement error, correlation and regression, probability, expectation, normal approximation, sample surveys, tests of significance.

Stat **251 Principles of Statistics** (3 cr). Satisfies core requirement J-3-c. Cr not given for both Stat 251 and 301. Intro to statistical methods including descriptive statistics, probability, confidence intervals, hypothesis testing, chi-square, analysis of variance, regression, and correlation. Prereq: Math 111 or 140 or 2 yrs of high school algebra.

Stat **ID&WS301 Probability and Statistics** (3 cr). WSU Stat 360. Intended for engineers, mathematicians, and physical scientists. Cr not given for both Stat 251 and 301. Intro to sample spaces, random variables, statistical distributions, hypothesis testing, basic experimental design, regression, and correlation. Prereq: Math 190.

Stat **ID401 Statistical Analysis** (3 cr). WSU Stat 401. Concepts and methods of statistical research including multiple regression, contingency tables and chi-square, experimental design, analysis of variance, multiple comparisons, and analysis of covariance. Prereq: Stat 251 or 301.

Stat **WS412 Biometry** (3 cr). WSU Stat 412.

Stat **WS-J420/WS-J520 Statistical Analysis of Qualitative Data** (3 cr). WSU Stat 420/520.

Stat **ID422 Sampling Methods** (2 cr). WSU Stat 422. Simple and stratified random sampling, systematic sampling, cluster sampling, double sampling, area sampling, and estimation of sample size. Prereq: Stat 251 or 301.

Stat **ID428 Geostatistics** (3 cr). See GeolE J428/J528.

Stat **433 Introduction to Econometrics** (3 cr). See Econ 433.

Stat **437 Statistics for Business Decisions** (2 cr). See Bus 437.

Stat **ID&WS451-ID&WS452 Probability Theory and Mathematical Statistics** (3 cr). See Math 451-452.

Stat **ID&WS-J453/ID&WS-J544 Stochastic Models** (3 cr). See Math J453/J544.

Stat **455 Applied Actuarial Science II** (0 cr). Review of mathematical and applied statistics in preparation for actuarial exam 2. Prereq: Stat 301 and Math 451-452.

Stat **456 Quality Control** (3 cr). See Bus 456.

Stat **457 Nonparametric Statistics** (2 cr). Methods of nonparametrical statistical tests. Prereq: Stat 251 or 301.

Stat **499** (s) **Directed Study** (cr arr). Prereq: perm.

Stat **500 Master's Research and Thesis** (cr arr).

Stat **502** (s) **Directed Study** (cr arr). Prereq: perm.

Stat **503** (s) **Workshop** (cr arr).

Stat **504** (s) **Special Topics** (cr arr).

Stat **R505 Engineering Statistics** (1-3 cr). See ES R505.

Stat **507 Experimental Design** (3 cr). Methods of constructing and analyzing designs for experimental investigations; analysis of designs with unequal subclass numbers; concepts of blocking randomization and replication; confounding in factorial experiments; incomplete block designs; response surface methodology. Prereq: Stat 401.

Stat **ID&WS510 Regression** (3 cr). WSU Stat 535. Simple multiple and polynomial regression in matrix format; estimation, testing, and prediction; stepwise and other numerical methods, examination of residuals, weighted least squares and nonlinear models. Prereq: Stat 301, 401, and Math 330.

Stat **ID514 Nonparametrics** (3 cr). WSU Stat 514. Conceptual development of nonparametric methods including one, two, and k-sample tests for location and scale, randomized complete blocks, rank correlation, and runs test; power, sample size, efficiency, and ARE. Prereq: Stat 401.

Stat **WS520 Statistical Analysis of Qualitative Data** (3 cr). See Stat J420/J520.

Stat **ID&WS521 Multivariate Analysis** (3 cr). WSU Stat 519. The multivariate normal, Hotelling's T2, multivariate general linear model, discriminant analysis, covariance matrix tests, canonical correlation, and principle component analysis. Prereq: Stat 401.

Stat **522 Statistical Genetics** (3 cr). See AnSc 522.

Stat **WS531 Econometrics** (3 cr). WSU Stat 531.

Stat **ID&WS533 Theory of Linear Models** (3 cr). WSU Stat 533. Theory of least squares analysis of variance models and the general linear hypothesis; small sample distribution theory for regression, fixed effects models, variance components models, and mixed models. Prereq: Math 451.

Stat **WS539 Time Series** (3 cr). WSU Stat 516.

Stat **ID&WS544 Stochastic Models** (3 cr). See Stat J453/J544.

Stat **R547 Applied Time Series Forecasting** (3 cr). See EE 547.

Stat **WS548-WS549 Statistical Theory I-II** (3 cr). WSU Stat 548-549.

Stat **ID555 Statistical Ecology** (3 cr). See For 555.

Stat **ID&WS571 Reliability Theory** (3 cr). WSU Stat 571. Alt/yrs. Stat concepts; stochastic material strengths and lifetimes; strength vs safety analysis; reliability of coherent systems; maintenance models; complex systems. Prereq: Math 451.

Stat **WS572 Data Analysis** (3 cr). WSU Stat 572.

Stat **597** (s) **Practicum** (cr arr). Prereq: perm.

Stat **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Curricular Requirements

MATHEMATICS (B.A. or B.S.)

Required course work includes the university requirements (see regulation J-3), the general requirements for either the B.A. or B.S. degree, and:

Course	Credits
Math 180, 190, 200 Analytic Geometry & Calculus	11
Math 215 Seminar in Topology of the Plane	3
Math 330 or 440 Linear Algebra	3
Math 461 Abstract Algebra	3
Math 462 Abstract Algebra or 472 Advanced Calculus	3
Math 471 Advanced Calculus	3
Math electives in courses numbered above 300, at least 6 cr of which are in courses numbered above 401	12
Phys 210, 211 Engr Physics I, II, and either Phys 222 or an upper-division physics course with a Math 180 prereq (to acquaint the student with an area in which math is systematically applied; upon approval of the dept, substitution of other courses to meet this requirement may be allowed)	9

MATHEMATICS: APPLIED (B.S.)

Required course work includes the university requirements (see regulation J-3), the general requirements for the B.S. degree, and:

Course	Credits
Math 180, 190, 200 Analytic Geometry & Calculus	11
Math 330 Linear Algebra	3
CS 112 Introduction to Problem Solving & Programming	3

And one of the following options:

A. STATISTICS OPTION

Course	Credits
Math 451-452 Probability Theory & Math Statistics	6
Math 453 Stochastic Models	3
Stat 301 Probability & Statistics	3
At least two courses from the following: Math 405 Analysis of Algorithms; Math 426 Optimization; Math 432 Numerical Linear Algebra; Math 433 Numerical Analysis; Math 440 Linear Algebra; Math 471-472 Advanced Calculus; CS 213 Data Structures	6
At least two courses from the following: Stat 401 Statistical Analysis; Stat 422 Sampling Methods; Stat 507 Experimental Design; Stat 510 Regression; Stat 514 Nonparametrics; Stat 521 Multivariate Analysis	5-6
Approved electives in fields where statistics is applied (not to be in stat courses)	6

B. COMPUTATION OPTION

Course	Credits
Math 405 Analysis of Algorithms	3
Math 432 Numerical Linear Algebra	3
Math 433 Numerical Analysis	3
CS 213 Data Structures	3
At least three courses from the following, including at least one course numbered 346 or above: Math 310 Ordinary Differential Equations; Math 326 Linear Programming; Math 346 Applied Combinatorics; Math 376 Discrete Math II; Math 426 Optimization; Math 485 Theory of Computation; Stat 301 Probability & Statistics	9
Two additional math courses numbered 400 or above	6

C. SCIENTIFIC OPTION

Course	Credits
Math 310 Ordinary Differential Equations	3
Math 480 Partial Differential Equations	3
Stat 301 Probability & Stat or Math 451 Probability Theory & Math Stat	3
At least two courses from the following: Math 202 Seminar; Math 420 Complex Variables; Math 432 Numerical Linear Algebra; Math 433 Numerical Analysis	5-6
Five additional math courses selected from 326, 346, or courses numbered 400 or above	15

D. ACTUARIAL SCIENCE OPTION

Course	Credits
Math 326 Linear Programming	3
Math 433 Numerical Analysis	3
Math 451-452 Probability Theory & Math Stat	6
Three courses selected from the following: Math 405 Analysis of Computer Algorithms; Math 432 Numerical Linear Algebra; Math 453 Stochastic Models; Math 471 Advanced Calculus; Math 472 Advanced Calculus; Stat 422 Sampling Methods; Stat 510 Regression; Stat 521 Multivariate Analysis	8-9
Acctg 201-202 Prin of Accounting or 395 Fundamentals of Accounting	4
Bus 301 Financial Management	3
Bus 403 Insurance	3
Econ 151, 152 Prin of Economics or 272 Foundations of Economic Analysis	4-6
Stat 301 Probability & Statistics	3
Stat 401 Statistical Analysis	3
At least one course selected from the following: Bus 401 Investments; Bus 405 Portfolio Management; Econ 321 Intermediate Microeconomic Analysis; Econ 433 Introduction to Econometrics; Econ 436 Economic & Business Forecasting	3

Academic Minor Requirements

MATHEMATICS MINOR

Course	Credits
Math 180, 190 Analytic Geometry & Calculus	8
Six math courses chosen from Math 200, Stat 301, and math courses numbered 300 or above	18

STATISTICS MINOR

Course	Credits
Stat 251 Prin of Statistics or 301 Probability & Statistics	3
Stat 401 Statistical Analysis	3
Stat 422 Sampling Methods	2
Math 160 Survey of Calculus or 180 Analytic Geometry & Calculus	4
Math 330 Linear Algebra	3
Two of the following courses: Stat 433 Introduction to Econometrics; Stat 437 Statistics for Business Decisions; Stat 456 Quality Control; Stat 457 Nonparametric Statistics or 514 Nonparametrics; Math 451 Probability Theory & Math Statistics	4-6

Department of Mechanical Engineering

E. Clark Lemmon, Dept. Chair (202 Gauss Lab. Bldg.). Faculty: Michael J. Anderson, Jasper R. Avery, Steven W. Beyerlein, Donald M. Blackketter, Ralph Budwig, Paul J. Dawson, Karen R. DenBraven, Dean B. Edwards, Donald F. Elger, Richard T. Gill, Richard T Jacobsen, E. Clark Lemmon, Edwin M. Odom, Steven G. Penoncello, T. Alan Place, Larry A. Stauffer, Weldon R. Tovey.

Mechanical engineering is concerned with the application of the principles of science and technology in the creation of products and systems to benefit mankind in several areas including: (1) the conversion of energy from natural sources to provide power, light, heating and cooling, and transportation; (2) the design and development of machines to extend and to increase the efficiency of human effort; (3) the design, development, and operation of systems for utilizing energy and other resources; and (4) the production of manufactured goods.

Mechanical engineering is broad in scope and provides a wide range of careers for trained professionals in industry, business, government, and universities. Positions are available in design, testing, manufacturing, research, development, operations, system analysis, marketing, and administration. Mechanical engineers are

often involved as professional team members in economic and social-humanistic matters and are responsible for the interaction of technical advances with social and environmental concerns.

The mechanical engineering program at UI is designed to prepare students for entry into professional practice and for continuing education at the master's and doctoral levels. The engineering sciences, physical sciences, mathematics, communications, humanities, and social sciences form the basis for the curriculum. The program also includes specialized courses in thermal sciences and applied mechanics. Development of creative ability in design and synthesis of machines and systems is an important part of the departmental curriculum. Computer applications are emphasized in course work. Students are encouraged to develop individual interests through the selection of technical elective courses.

The department has a variety of equipment for instruction and research applications. Among the facilities available are an industrial robot, a large electrohydraulic universal testing machines, standard metallographic facilities, vibration testing equipment, solar collector systems, engine testing equipment, wind tunnels, specialized computing equipment, and data acquisition and measurement systems. Research and laboratory equipment in other departments is also used by mechanical engineering students.

Research projects conducted by faculty members provide both experience and financial support for undergraduate and graduate students in mechanical engineering. Faculty members also perform consulting services in addition to their academic responsibilities.

Faculty members are available to discuss details of the program in their specialty areas with interested students. General questions regarding the undergraduate program should be addressed to the undergraduate adviser, Jasper R. Avery, or the department chair (telephone 208/885-6579).

A degree in manufacturing engineering is available as a cooperative effort with Boise State University and will be offered only in Boise when resources become available. Contact the department for more information.

The following graduate degrees are available in mechanical engineering: Ph.D., M.S., and M.Engr. (nonthesis degree). The department offers M.S. and M.Engr. degrees in manufacturing engineering in Boise in cooperation with Boise State University. In addition, the Ph.D., M.S., and M.Engr. in nuclear engineering are offered at the UI/Idaho Falls Center for Higher Education. Minimum preparation for graduate study in mechanical engineering is a B.S. degree in a curriculum in mechanical engineering that is accredited by the Accreditation Board for Engineering and Technology (A.B.E.T.). Students entering the program with an engineering or physical science baccalaureate degree in a major other than mechanical engineering must demonstrate proficiency in the subjects required in the B.S.M.E. program. Individual student qualifications are assessed by the departmental graduate committee, which also determines undergraduate deficiencies. The graduate adviser and chair of the Graduate Committee is E. Clark Lemmon, 202 Gauss (208/885-6579).

Mechanical Engineering Courses

Note: Preadvising is required for all mechanical engineering courses; consult the mechanical engineering adviser or departmental administrator.

ME **223 Mechanical Design Analysis** (2 cr). Fundamentals of engineering design, graphic representation and computer-aided design (CAD) of engineering systems. Two lec a wk. Prereq: Engr 101, CS 105, or perm.

ME **253 Materials Processing** (3 cr). Theory and practice of machining, casting, forming, and shaping materials; intro to numerical control (N/C) and computer-aided manufacturing (CAM) tech.

ME **261 Engineering Materials** (3 cr). Fundamental factors in influencing properties and selection of materials. Prereq: Chem 111.

ME **262 Engineering Materials Lab** (1 cr). Crystallography, mechanical testing, phase transformations, heat treatment and corrosion of polymers, metals, and ceramics. One 2-hr lab a wk. Coreq: ME 261.

ME **304 Materials Selection for Mechanical Design** (2 cr). Selection of engineering materials related to service conditions. Prereq: ME 261.

ME **322 Applied Thermodynamics** (4 cr). First and second laws; property relations; mixtures; irreversibility and availability; cycles; selected topics in applied thermodynamics; application of computers in thermodynamic system analysis and design. Three lec and one hr of lab a wk. Prereq: ES 321.

ME **ID&WS324 Dynamic Analysis in Machine Design** (3 cr). WSU M E 312. Kinematic, static, and dynamic principles and application to analysis and synthesis of machines with emphasis on computer-aided design (CAD) tech. Two lec and one 3-hr lab a wk; one 1-day field trip. Coreq: ES 220, Math 310; coreq: ME 223.

ME **330 Experimental Methods for Engineers** (3 cr). Measurement systems and their application to engineering problems; topics include generalized performance of measurement systems, measuring and control devices, data acquisition and analysis, and report writing. Two lec and one 2-hr lab a wk. Coreq: EE 207, ES 320, 321, 340.

ME **345 Heat Transfer** (3 cr). Transmission by conduction of heat in steady and unsteady states, by free and forced convection, and by radiation; combined effects of conduction, convection, and radiation. Prereq: ES 321, Math 310.

ME **361 Applied Engineering Materials** (3 cr). Strengthening and surface treatment of materials; joining of metals; properties of nonmetallics; composite materials; photomicrography; failure investigation of mech engineering systems. Two lec and one 2-hr lab a wk. Prereq: ME 261.

ME **ID&WS380 Modeling of Engineering Systems I** (3 cr). WSU M E 313. Application of mathematical and basic engineering principles in solution of engineering problems and mathematical modeling of engineering systems; solution of problems by analytic and numerical methods; intro of computer program for dynamic systems analysis and for data analysis. Prereq: Math 310.

ME **381 Modeling of Engineering Systems II** (2 cr). Continuation of ME 380, including transfer functions, state variable techniques, simulation diagrams, and complex systems modeling. Prereq: ME 380.

ME **WS402 Polymeric Materials** (3 cr). WSU MSE 402.

ME **404** (s) **Special Topics** (cr arr).

ME **409 Human Factors in Engineering Design** (3 cr). Application of psychological principles to engineering and design; psychological models and principles from areas of perception, cognition, and information processing; the design process; display and control design; work station layout and system integration; environmental factors; safety; mental workload; human-computer interaction; and current research topics. Prereq: upper-div standing in engineering.

ME **410 Production Engineering** (3 cr). Planning, analysis, and control of engineering design processes, decision models, CPS, PERT, data collection, linear programming, materials management, quality control, computer techniques.

ME **412 Gas Dynamics** (3 cr). Compressible flow in ducts and nozzles, shock waves and expansion waves, and adiabatic two-dimensional compressible flow. Prereq: Math 310, ES 320, and ES 321.

ME **J413/J513 Acoustics** (3 cr). Fundamentals of acoustics including wave theory, acoustic transmission phenomena, acoustic transmission lines, acoustics of enclosed spaces, sound generation, and sound attenuation. Additional projects/assignments reqd for grad cr. Prereq: ES 320, ES 321, ME 380.

ME **J420/J520 Fluid Dynamics** (3 cr). Same as CE J420/J520. Cr not granted for both ME 420 and ME 520. A second fluid dynamics course emphasizing theoretical perspective appropriate for either research or grad school preparation; topics include fluid properties, tensor analysis, kinematics, Navier-Stokes equation, energy equation, and vortex dynamics; study of current literature. Additional projects/assignments reqd for grad cr. Prereq: ES 320, Math 310, or perm.

ME **422 Analytical Thermodynamics** (3 cr). Thermodynamic properties of real fluids; computer modeling and analysis of thermodynamic systems. Prereq: ME 322 or perm.

ME **425 Mechanical Design** (4 cr). Stress and strain, material failure, combined stresses, variable and impact loading, machine elements, lubrication theory, bearing design, and computer-aided design (CAD) principles. Prereq: ME 223, ES 340.

ME **426 Mechanical Design** (5 cr). Capstone design instruction and project, including economic analysis, cost estimation, decision making, optimization, value analysis, product reliability, CAD, and other design techniques; students work in teams to solve industrial design projects. Three lec, two 2-hr labs, and four hrs of independent work a wk; one 1-day field trip. Prereq: ME 324, 425; coreq: Eng 317.

ME **427 Computer Aided Design** (3 cr). CAD techniques including finite element and optimum design, applications to mechanical systems elements with practical design constraints. Coreq: ME 425 or perm.

ME **430 Senior Lab** (3 cr). Detailed lab investigation of engineering problem; statistical design of experiments; application of engineering principles to analyze experimental data; technical report writing; oral communication skills. One lec and four hrs of lab a wk. Prereq: ME 330; coreq: Eng 317.

ME **433 Combustion Engine Systems** (3 cr). Theory and characteristics of combustion engines; combustion process analysis; fuels, exhaust emissions and controls; system analysis and modeling. Prereq: ME 322; coreq: ME 345.

ME **435 Thermal Systems and Design: Energy Systems** (3 cr). Design and applications of alternative energy systems, including solar energy, wind power, photovoltaic, geothermal, and others. Prereq: ME 322, 345.

ME **J439/ID&WS-J539 Advanced Mechanics of Materials** (3 cr). Same as CE 510 and ES 440. WSU C E 514. Limitations of results of ES 340, more complex situations of loading and structural geometry, applications to design of machines and structures. Additional projects/assignments reqd for grad cr. Prereq: ES 340, Math 310.

ME **444 Air Conditioning Engineering** (3 cr). Requirements for air conditioned spaces for human comfort; thermodynamic properties of air-water vapor mixtures; heating and cooling loads; design of systems for heating, cooling, and ventilation. Prereq: ME 322, 345.

ME **J445/ID&WS-J545 Numerical Conduction Heat Transfer** (3 cr). WSU M E 513. Cr not granted for both ME 445 and ME 545. Steady-state and transient conduction of heat; analytical and numerical methods including finite differences, finite elements, and boundary elements. Additional projects/assignments reqd for grad cr. Prereq: ME 345, 380, or perm.

ME **J451/J551 Experimental Methods in Fluid Dynamics and Heat Transfer** (3 cr). Cr not granted for both ME 451 and ME 551. Theory and applications of transducers and instrumentation to measure velocity, temperature, and related quantities; flow visualization, pressure measurements, thermal anemometry, laser Doppler velocimetry, temperature and concentration measurement, and heat flux measurement. Additional projects/assignments reqd for grad cr. One 1-1/2 hr lec and one 3-hr lab a wk. Prereq: ME 330; coreq: Eng 317, ME 345, or perm.

ME **461 Fracture Mechanics** (3 cr). Fracture mechanics approach to structural integrity, fracture control, transition temperature, microstructural and environmental effects, fatigue and failure analysis. Prereq: ME 261, ES 340.

ME **WS470 Kinematic Synthesis** (3 cr). WSU M E 470. Cr not granted for both ME 470 and 570.

ME **ID&WS-J472/ID&WS-J572 Mechanical Vibrations** (3 cr). WSU M E 449. Cr not granted for both ME 472 and ME 572. Free and forced vibration of single degree of freedom, multiple degree of freedom, and continuous systems; response of mechanical systems to inputs of varying complexity, ranging from single frequency to pseudo-random; applications to mechanical design and vibration control. Additional projects/assignments reqd for grad cr. Prereq: ME 380, ME 381 or equivalent.

ME **473 Experimental Stress and Vibration Analysis** (3 cr). Measurement of static and dynamic displacements, strains and stresses on deformable bodies; use of a universal test frame, extensometers, and strain gauges for quantitative static measurements, photoelasticity and brittle coating tech for qualitative static measurements; use of accelerometers, strain gauges, eddy current sensors, and impact hammers for dynamic measurements; emphasis on digital data acquisition and analysis. Coreq: ME 472, ME 439 or perm.

ME **J476/J576 Automation, Robotics, and Computer Integrated Manufacturing** (3 cr). Cr not granted for both ME 476 and ME 576. Comprehensive technical survey of important topics in production automation and related systems; flow line production, industrial robotics, material handling, group technology, flexible manufacturing systems, process control, and computer integrated manufacturing (CIM). Additional projects/assignments reqd for grad cr. Prereq: ME 380 or equiv, or perm.

ME **ID&WS-J481/J581 Control Systems** (3 cr). WSU M E 481. Cr not granted for both ME 481 and ME 581. Analysis and design of feedback control systems utilizing frequency and time domain methods. Additional projects/assignments reqd for grad cr. Prereq: ME 380.

ME **J485/J585 Systematic Methods and AI in Engineering Design** (3 cr). Development of two new topics in engineering design—systematic methods and artificial intelligence (AI); systematic methods, originated in West Germany, give the engineer a structured approach to design, requiring task clarification and functional development; AI is an area of cognitive science that can be applied to design through expert systems, logic programming, knowledge representation, etc. Additional projects/assignments reqd for grad cr. Prereq: sr or grad standing in engineering.

ME **491 Seminar** (0 cr). Graded P/F. Professional practice and technical topics, professional registration, presentations by practicing engineers. One 3-6 day field trip may be reqd. Prereq: sr standing.

ME **499** (s) **Directed Study** (cr arr). Selected topics. Detailed report reqd. Prereq: sr standing and perm.

ME **500 Master's Research and Thesis** (cr arr).

ME **502** (s) **Directed Study** (cr arr). Supervised study, including critical reading of current literature. Prereq: perm.

ME **503** (s) **Workshop** (cr arr). Prereq: perm.

ME **504** (s) **Special Topics** (cr arr).

ME **ID&WS505 Dynamics** (3 cr). WSU M E 540. Dynamic specs of solid bodies; rectangular, angular, and plane motion; three-dimension dynamics; beams. Prereq: Math 310, or perm.

ME **507 Machine Design** (3 cr). Advanced mechanical design to meet needs and interests of students; special projects. Prereq: ME 425 or perm.

ME **508 Advanced Stress Analysis** (3 cr). Evaluation of stress and strain by analytical and experimental methods; use of digital computer; applications to design of mechanical components. Prereq: ME 473, ES 340.

ME **513 Acoustics** (3 cr). See ME J413/J513.

ME **515 Transport Phenomena** (3-4 cr). See ChE 515.

ME **520 Fluid Dynamics** (3 cr). See ME J420/J520.

ME **WS521 Fundamentals of Fluid Mechanics** (4 cr). WSU M E 521.

ME **ID&WS522 Statistical Thermodynamics** (2-3 cr). WSU M E 511. Probability theory and quantum mechanics, statistical mechanics, thermodynamic probability, molecular interpretation of first and second laws; kinetic theories. Prereq: ES 321.

ME **524 Thermodynamics** (2-3 cr). Thermodynamic laws for design and optimization of thermodynamic systems, equations of state, properties of ideal and real fluids; recent development in experimental and theoretical thermodynamics. Prereq: ME 322 or perm.

ME **R525 Advanced Heat Transfer** (2-3 cr). See ChE 525.

ME **R528 Advanced Thermodynamics** (3 cr). Same as ChE 528. Laws of thermodynamics and statistical thermodynamics; equations of state; thermodynamic properties of ideal and real fluids; pure components and mixtures; physical and chemical equilibrium; design and optimization of thermodynamic systems. Prereq: perm.

ME **WS530A Reinforced Polymer and Wood Based Composites** (3 cr). WSU MSE 548.

ME **WS530B Solid Mechanics** (3 cr). WSU M E 530.

ME **WS531 Deformation and Fracture of Solids** (3 cr). WSU M E 531.

ME **WS533 Experimental Methods in Materials and Manufacturing Process** (3 cr). WSU M E 533.

ME **WS534A Advanced Manufacturing Process** (3 cr). WSU M E 574.

ME **ID534B Mechanics of Composite Materials** (3 cr). WSU M E 534. Analysis of micromechanical and macromechanical behavior of composite materials with emphasis on fiber-reinforced composite; prediction of properties; stiffness and strength theories; laminated beams and plates; dynamic behavior; environmental effects. Prereq: ES 340, Math 310.

ME **535 Failure of Structural Materials** (3 cr). See Met 535.

ME **R537 Advanced Fluid Mechanics** (2-3 cr). See ChE 537.

ME **ID&WS539 Advanced Mechanics of Materials** (3 cr). See ME J439/J539.

ME **540 Continuum Mechanics** (3 cr). See ES 540.

ME **541 Mechanical Engineering Analysis I** (2-3 cr). See ChE 541.

ME **WS542 Optimal Control of Dynamic Systems** (3 cr). WSU M E 542.

ME **WS543 Natural and Synthetic Polymeric Materials** (3 cr). WSU MSE 543.

ME **WS544 Basic Principles of Adhesion** (3 cr). WSU MSE 547.

ME **ID&WS545 Numerical Conduction Heat Transfer** (3 cr). See ME J445/J545.

ME **ID&WS546 Convective Heat Transfer** (3 cr). WSU M E 515. Energy conservation equations; laminar and turbulent forced convective heat transfer; internal and external flow; free convection. Prereq: ME 345 or perm.

ME **ID&WS547 Thermal Radiation Processes** (2-3 cr). WSU M E 514. Thermal radiation; radiation interchange among surfaces; radiation in absorbing-emitting gases; combined modes of heat transfer. Prereq: ME 345 or perm.

ME **548 Elasticity** (3 cr). See CE 548.

ME **549 Finite Element Analysis** (3 cr). See CE 546.

ME **ID&WS550 Advanced Vibration Analysis** (3 cr). WSU M E 541. Analysis of discrete and continuous vibrating systems, finite difference and transfer matrix methods, frequency analysis, random vibrations. Prereq: ME J472/572 or perm.

ME **551 Experimental Methods in Fluid Dynamics and Heat Transfer** (2 cr). See ME J451/J551.

ME **WS552 Experimental Methods in Thermal-Fluid Science** (3 cr). WSU M E 552.

ME **WS553 Two-Phase Flow** (1-3 cr, max 3). WSU M E 553.

ME **WS556 Numerical Modeling in Fluid Mechanics** (3 cr). WSU M E 556.

ME **557 Advanced Fluid Dynamics** (3 cr). Potential flow and boundary layer theory, plus one or more advanced topics. Prereq: ME J420/J520 or 540 or perm.

ME **WS561 Combustion** (2-3 cr). WSU M E 561.

ME **WS570 Kinematic Synthesis** (3 cr). WSU M E 570. Cr not granted for both ME 470 and 570.

ME **572 Mechanical Vibrations** (3 cr). See ME J472/J572.

ME **576 Automation, Robotics, and Computer Integrated Manufacturing** (3 cr). See ME J476/J576.

ME **581 Control Systems** (3 cr). See ME J481/J581.

ME **585 Systematic Methods and AI in Engineering Design** (3 cr). See ME J485/J585.

ME **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

ME **600 Doctoral Research and Dissertation** (cr arr).

Curricular Requirements

MANUFACTURING ENGINEERING (B.S.Mfg.E.)

This curriculum is a cooperative effort with Boise State University and will be offered only in Boise when resources become available. Contact the department for more information.

Required course work includes the university requirements (see regulation J-3), and the following:

Course	Credits
Courses common to engineering curricula (see part 4)	38
EE 207 Introduction to Electrical Engineering	3

EE 314 Electronic Systems or EE 324 Electric Machinery	3
Eng 317 Technical & Engineering Report Writing	3
Engr 411 Engineering Fundamentals	0
ES 220 Dynamics	3
ES 320 Fluid Mechanics	3
ES 321 Thermodynamics & Heat Transfer	3
ES 340 Mechanics of Materials	3
Math 310 Ordinary Differential Equations	3
ME 223 Mechanical Design Analysis	2
ME 253 Materials Processing	3
ME 261, 262 Engineering Materials & Lab	4
ME 324 Dynamic Analysis in Machine Design	3
ME 330 Experimental Methods for Engineers	3
ME 380, 381 Modeling of Engineering Systems I, II	5
ME 409 Human Factors in Engineering Design	3
ME 410 Production Engineering	3
ME 425, 426 Mechanical Design	9
ME 427 Computer Aided Design	3
ME 430 Senior Laboratory	3
ME 476 Automation, Robotics, & Computer Integrated Manufacturing	3
ME 481 Control Systems	3
ME 491 Seminar	0
Phys 212 Engineering Physics I Lab	1
Phys 213 Engineering Physics II Lab	1
Stat 301 Probability & Statistics	3
Humanities and social sciences electives (incl at least (1) one upper-div course or (2) a course that has another humanities-social sc course as a prereq)	16
Approved technical electives	3

The minimum number of credits for the degree is 130.

A grade of C or better is required in the following courses for upper-division certification: Chem 111, Engr 101, ES 210, Math 180, Math 190, Math 200, Phys 210.

MECHANICAL ENGINEERING (B.S.M.E.)

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
Courses common to engineering curricula (see part 4)	38
ME 223 Mechanical Design Analysis	2
ME 253 Materials Processing	3
ME 261, 262 Engineering Materials & Lab	4
ME 322 Applied Thermodynamics	4
ME 324 Dynamic Analysis in Machine Design	3
ME 330 Experimental Methods for Engineers	3
ME 345 Heat Transfer	3
ME 380, 381 Modeling of Engineering Systems I-II	5
ME 425, 426 Mechanical Design	9
ME 430 Senior Laboratory	3
ME 491 Seminar	0
EE 207 Introduction to Electrical Engineering	3
EE 314 Electronic Systems or 324 Electrical Machinery	3
ES 220 Engineering Dynamics	3
ES 320 Fluid Dynamics	3
ES 321 Thermodynamics & Heat Transfer	3
ES 340 Mechanics of Materials	3
Engr 411 Engineering Fundamentals	0
Eng 317 Technical & Engineering Report Writing	3
Phys 212-213 Engineering Physics Lab	2
Humanities and social sciences electives (incl at least (1) one upper-div course or (2) a course that has another humanities-social sc course as a prereq)	16
Technical electives	15

The minimum number of credits for the degree is 131.

A grade of C or better is required in the following courses for upper-division certification: Chem 111, Engr 101, ES 210, Math 180, Math 190, Math 200, Phys 210.

NOTE: The 15 cr in technical electives must be selected subject to the following guidelines: (1) electives must be upper-division courses (300-level or above); (2) a minimum of 8 cr must be taken from ME courses; (3) at least 2 cr must be taken from each of the two broad categories of mech engr: (a) thermal sciences and (b) applied mechanics and materials; (4) a coherent package of technical electives must be developed in consultation with an adviser; and (5) elective courses must be chosen so a minimum of three design units is achieved as follows: (a) one design unit: ME 412, 433, 435; (b) two design units: ME 304, 361, 409, 444, 451, 461, 472, 473, 476, 481; and (c) three or more design units: ME 410, 427, 485.

Medical Education Program

Michael B. Laskowski, Director, WAMI (Washington, Alaska, Montana, Idaho) Medical Education Program (304 Student Health Services Bldg.). Faculty: Gregory A. Bohach, Constance J. Brumm, Mark E. DeSantis, Victor P. Eroschenko, Dale O. Everson, Susan Gelletly, Robert J. Gregory, Thomas A. McKean, Philip J. Mohan, David P. Olson, Mary P. Presol, David G. Rych, Francis K. Spain, William Trumble, Robert Wiggins.

The following medical doctors serve as affiliate clinical professors (preceptors) of medical science: Betty Adams, Richard M. Alford, James R. Arthurs, Eugene M. Baldeck, Knute Barnes, Thomas M. Bowen, Patricia Brady, Constance J. Brumm, Gregory J. Burrato, Donald Chin, Harry Chinchinian, Jane Cline, Robert A. Closson, Robert C. Colburn, Steve Cox, Stacey R. Dean, Andrew Devlin, Richard B. Donati, Colin Doyle, Ronald E. Dunn, Ronald Dupont, Richard A. Emtman, Alvin Frostad, Susan K. Gelletly, Catherine Gorchels, Bruce L. Ham, Cameron D. Hinman, Bonnie Houff, John R. Huberty, Martha Hunt, Jay A. Hunter, Richard A. Jacobs, Brad Johnson, Harry A. Knopper, Carl T. Koenen, Jerome Lang, Wenzel Leff, Spencer M. Long, Dean H. Mahoney, William C. Mannschreck, David E. Margaret, Freddy Martinez, Carl M. Melina, C. Michael Murphy, Robert L. Olson, Lloyd E. Perino, Dennis L. Peterson, Michael T. Rooney, Wayne Ruby, David Rych, Andrew J. Saueracker, David D. Shupe, Dennis Simpson, David A. Spencer, David N. Spencer, John Stoianoff, Robert Tulin, Claude Weitz, Robert Wiggins, A. Morgan Wright.

WAMI is a cooperative medical education program designed to enhance the training capability of the University of Washington School of Medicine (UWSM) by utilizing the facilities of Washington State University (WSU), University of Alaska, Montana State University, and the University of Idaho (UI). The WAMI program utilizes the physicians' expertise in the states by providing clinical clerkships in the four-state area via a network of 23 community training units for third- and fourth-year medical students. The WAMI program at UI offers first-year medical students an ideal opportunity to study basic medical courses. Because of the small class size, there is a splendid opportunity to interact closely with the faculty.

The WAMI program allows access to medical education for Idaho residents by providing positions at UWSM. These 60 positions, 15 for each of the four years, are reserved exclusively for Idaho residents.

The WAMI program was developed in Idaho to train Idaho residents in medical studies, to address the need for more primary care physicians practicing in rural areas, to extend the resources and facilities of an excellent medical school into Idaho, to improve the quality of patient care, and to minimize the cost of medical education by the use of existing facilities.

Eligibility for consideration as a WAMI medical student requires certification as an Idaho resident. UI's Admissions Office is responsible for residency certification.

Students interested in WAMI follow the normal application procedures of UWSM. Idaho residents (15) take their first year of medical studies at UI. First-year courses are offered conjointly by UI and WSU in parallel with courses at UWSM. All participating faculty at UI and WSU are subject to the approval of UWSM and are eminently qualified scientists and scholars.

Many of the physicians in the Moscow-Lewiston area are involved in the preceptorship program in which the students work with local physicians and observe their practice in the office and at the hospital.

Since 1972, community clinical units in Boise and Pocatello have been training upper-division medical students in the areas of obstetrics and gynecology, pediatrics, and family medicine. A UWSM clerkship in internal medicine is also offered through the V.A. Hospital in Boise.

Special facilities are maintained for the medical students, including individual study carrels, videotapes, films, and other resource materials in a Curriculum Support Center.

Participants in the WAMI program are matriculated students of the University of Washington Medical School. Upon completion of their studies, they receive the M.D. degree. Following graduation, a postgraduate (internship/residency) training period of three to five years is considered the normal pathway to private practice. Medical students may also be approved for graduate studies at UWSM

leading to the M.S. or Ph.D. degree. The M.D.-Ph.D. curriculum usually requires a minimum of six years of study.

Medical Science Courses

Note: All courses in this subject field are open automatically only to students who have WAMI medical student status. Some of the medical science courses are also open to graduate students by permission of the instructor and the WAMI director.

MedSc **501** (s) **Seminar** (cr arr).

MedSc **502** (s) **Directed Study** (cr arr). Areas normally offered are directed dissection of the extremities, trunk, head, neck, abdomen, and pelvis; endocrinology, physiology, and other medically related studies.

MedSc **504** (s) **Special Topics** (cr arr).

MedSc **505 Preceptorship** (cr arr). To provide opportunity for first-year medical students to gain personal experience with and insight into medical practice situations; the student will be stationed with physicians in their offices in accordance with the student's preference of discipline at the WAMI sites.

MedSc **ID&WS510 Histology** (3 cr). WSU Med S 510. Microscopy of cells; tissues and organs of the human body; emphasis on function. Three lec and one 3-hr lab a wk.

MedSc **ID&WS511 Anatomy of the Trunk** (5 cr). WSU Med S 511. Regional study of anatomy of human thorax, abdomen, pelvis, and perineum in correlation with clinical cases. Two lec and one 3-hr lab a wk.

MedSc **ID&WS512 Basic Mechanisms in Cellular Physiology** (4 cr). WSU Med S 512. Basic physiological mechanisms, primarily at the cellular level.

MedSc **ID&WS513 Introduction to Clinical Medicine I** (1 cr). WSU Med S 513. Communication skills and interview techniques to form the basis for the eventual doctor-patient relationship.

MedSc **ID&WS514 Molecular and Cellular Biology I** (3 cr). WSU Med S 514. Classical molecular and cellular biochemistry, cellular physiology, and molecular genetics.

MedSc **ID&WS516 Systems of Human Behavior** (2 cr). WSU Med S 516. Conceptual systems and models of behavior, normality and abnormality, environment and social learning, conditioning, learning in the autonomic nervous systems, catecholamines and behavior, illness behavior, feelings, emotion and cognition, physician-patient interaction, diseases and tech of behavior change; human development from birth to senescence emphasizing disorders that occur during various life phases.

MedSc **ID&WS520 Cell and Tissue Response to Injury** (3 cr). WSU Med S 520. Cell and tissue injury, inflammation, and neoplasia.

MedSc **ID&WS521 Natural Hist of Infectious Diseases and Chemotherapy** (5 cr). WSU Med S 521. Pathogenesis, resistance, epidemiology, clinical manifestations and control of bacterial, fungal, parasitic, and viral infectious diseases, principles of chemotherapy and asepsis; sterilization; nosocomial and iatrogenic infections and prevention.

MedSc **ID&WS522 Introduction to Clinical Medicine II** (2 cr). WSU Med S 522. Continuation of communication skills especially as related to and dealing with effective material.

MedSc **ID&WS523 Medical Immunology** (2 cr). WSU Med S 523. Principles of immunology and their relationship to human medicine.

MedSc **ID&WS524 Molecular and Cellular Biology II** (2 cr). WSU Med S 524. Continuation of MedSc 514.

MedSc **ID&WS526 Systems of Human Behavior** (2 cr). WSU Med S 526. See MedSc ID&WS516 for description.

MedSc **ID&WS530 Epidemiology** (2 cr). WSU Med S 530. Intro to biostatistical inference; interaction of agent, host, and environment in disease causation and transmission.

MedSc **ID&WS531 Head, Neck, Ear, Nose, and Throat** (5 cr). WSU Med S 531. Gross anatomy, including skull, pharynx, and larynx; audition and balance.

MedSc **ID&WS532 Nervous System** (5 cr). WSU Med S 532. Normal structure and function of the nervous system, including the eye.

MedSc **ID&WS535 Introduction to Clinical Medicine III** (2 cr). WSU Med S 535. Screening physical exam.

Department of Metallurgical and Mining Engineering

Gene E. Bobeck, Dept. Head (217 Mines Bldg.).

Metallurgy Faculty: Robert W. Bartlett, Sarit Bhaduri, Gene E. Bobeck, Francis H. Froes, Batric Pesic, Keith A. Prisbrey, Patrick R. Taylor, T. Alan Place. Affiliate Faculty: Bill E. McKee.

Mining Engineering Faculty: Christopher J. Hall, Robert Hautala, S. J. Jung, Martin L. Smith, Kenneth F. Sprenke. Adjunct Faculty: Patricia L. Hautala, Stanley A. Miller, Jeffrey K. Whyatt.

Every country in the world has mineral resources that could be of benefit to its citizens. It is only upon the addition of the technological capability to convert these resources to mineral reserves, and finally into products useful to mankind, that the resources have value. Second only to agricultural resources are the mineral resources. Our modern world is a result of the technological utilization of these mineral resources. The advancement, or even continuation, of our present standard of living is dependent upon this technology.

Mining engineering includes a wide variety of mining technologies and engineering sciences devoted to the extraction or separation of the various mineral products—fuels, metals, and nonmetals. Separation of these minerals from the ground requires knowledge of the adaptation of equipment, manpower, and economics and the application of reclamation, environmental control, legal, social, and administrative talents. Mining engineering is the coordination of all engineering fields and the administrative talents employed in extracting these materials from the earth and making them available economically.

Metallurgical engineering is the technology devoted to removing the metals, nonmetals, or fuel elements from rock and even water and putting them in a form useful to mankind. This requires enhancement of the materials, separation of the minerals, and finally separation of the metals and elements from the minerals and rock into pure or semi-pure form economically. Metallurgical engineering involves the use of all the sciences and academic information from other fields to provide these metals for the everyday products we use in our industries and homes. It is the technology behind the materials that makes communication, transportation, recreation, daily living, and a healthful environment possible. More recently, a worldwide effort to develop nontraditional materials that combine metallics and nonmetallics has been met by additional study and faculty in the materials and processing area. Coordination with other university departments provides broader training.

As technological and engineering fields, both metallurgical engineering and mining engineering offer a tremendous opportunity for the person who wishes to become involved in the application of our natural mineral resources to the preservation and enhancement of man. The department provides the technical training for the beginning of this understanding through both the mining engineering and metallurgical engineering fields.

The objectives of the department are to provide adequate training, based upon high school preparation in mathematics and science, so that the student may understand, first of all, the fields of engineering, and, secondly, how these apply to the adaptation of mineral resources to mankind. It is the goal of the department to provide first-class training so that the engineer graduating from the department will be competitive with all other engineers with equivalent degrees in the world, will be current in the technology, will have a practical orientation, and will be a broad and understanding member of the society.

History shows that the graduates from the program have been very competent citizens able to contribute to the development of the mineral resource engineering fields, have become excellent and leading members of society, and live useful and fulfilling lives.

Laboratories for the technologies of rock mechanics, surveying, ventilation, computer applications, and planning facilities are available in mining engineering. The facilities for mineral processing include comminution and pilot plant, extraction processes, hydrometallurgy (including pressure leaching), electrometallurgy, chemical metallurgy, and physical metallurgy laboratories for learning about the basic building blocks of material, as well as metallography, x-ray diffraction and fluorescence, heat treating, and other laboratories that provide understanding of converting the minerals into useful metals and products.

The staff members in both disciplines have proved their qualifications by their credentials in national and international professional societies. They are well known by their publications, research, and contract work. Exposure to these faculty members provides the students with a one-to-one interaction and an expertise that makes them truly competitive.

The program is designed to take advantage of the other excellent facilities of the university and other engineering disciplines. The program of study also includes involvement with practical aspects of day-to-day mining and metallurgy by exposure to the regional industries and research groups through field trips, guest speakers, study problems, and work time during the summer or cooperative efforts as desired. Mining and metallurgical operations in the Northwest are plentiful and modern.

In normal times, most students find employment in the summer or on a cooperative basis, so that they can become more intimately involved in the processes that they are studying. The total program enables the person to leave the university with confidence, either as a baccalaureate student or on the master's or doctoral level, with the capability of a truly competent professional.

The department offers both the Master of Science degree and the doctoral degree in both of the disciplines. These programs include a mix of theoretical and practical study most appropriate to each student. Many studies include mathematical, statistical, and computer applications to specific processes or investigations. Some students prefer to work on applied problems that are presented by industry or research establishments in the area, often with funding from outside sources. Studies may be as varied as individual effort and interests.

These studies may be financed at times by research grants, an industry sponsor, or on rare occasions by departmental funding. They are designed to train the individual in research methods and investigative procedures that will enhance his or her ability in industrial or research applications or in teaching at a later date. The doctoral program is directed toward breaking new ground and advancing the field to maintain the competitive technological lead enjoyed in the U.S. for so many years. The master's program generally requires 12 to 18 months beyond the baccalaureate degree and the doctoral program usually entails at least three years beyond the baccalaureate degree.

Courses

METALLURGICAL ENGINEERING

Met **101 Introduction to Metallurgy and Materials Science** (1 cr). Earth resources, metallurgy, materials science, and manufacturing.

Met **200** (s) **Seminar** (cr arr). Prereq: perm.

Met **201 Elements of Materials Science** (3 cr). Principles relating properties of metals, ceramics, polymers, and composites to their structures. Prereq: Chem 103 or 111 or 114.

Met **202 Microstructural Evaluation** (2 cr). Techniques for preparing materials for observation and evaluation of microstructure by optical and scanning and transmission electron microscopy. One 2-hr and one 3-hr lab a wk. Coreq: ME 261.

Met **204** (s) **Special Topics** (cr arr).

Met **205 Introduction to Metallurgy** (3 cr). Mineral processing, hydrometallurgy, pyrometallurgy, and electrometallurgy; principles of materials science; structures, properties, and processes; phase diagrams and welding. Two lec and 1 hr of lab demonstration a wk; extra lab time reqd as assigned. Prereq: Math 190, Chem 112 or 114, CS 105 or 112 or equiv; coreq: ES 210.

Met **211 Metallurgical Mass and Energy Balance** (3 cr). Dimensions, units, and conversion factors; stoichiometry; sampling and measurements; thermochemistry; calculations of material and energy balances applied to particular processes in ferrous and nonferrous metallurgy.

Met **299** (s) **Directed Study** (cr arr). Prereq: perm.

Met **305 Structure of Solids** (3 cr). Crystallography, crystal properties and chemical bonding, defects, amorphous solids, polymorphism and crystal growth. Prereq: Chem 103 or 111 or 114, and Phys 211.

Met **308 Metallurgical Thermodynamics** (3 cr). Intro; first, second, and third law; auxiliary functions; behavior of solutions; free energy composition and phase diagrams of binary systems; reaction equilibria in systems containing components in condensed solutions; ternary diagrams; thermodynamics of alloys and ceramic materials. Prereq: Chem 112 or 114, Math 310.

Met **309 Metallurgical Transport Phenomena** (3 cr). Intro to principles of metallurgical transport phenomena including heat, mass, and momentum transfer. Coreq: Math 310.

Met **310 Metallurgical Reactor Design** (3 cr). Fundamental principles. Prereq: Math 310.

Met **313 Physical Metallurgy I** (4 cr). Theory, structure, and properties of materials. Prereq: ME 261.

Met **316 Physical Metallurgy II** (3 cr). Continuation of Met 313, with emphasis on transformations in materials. Prereq: Met 313.

Met **341 Particulate Materials Processing** (4 cr). Engineering science of particulates; powder production, powder properties, separation; design of systems applied to metals, ores, and concentrates. Three lec and one hr of lab a wk; two 1-day field trips. Prereq: Chem 112 or 114, ES 210, CS 105 or 112, Met 211, ME 261; coreq: Math 310.

Met **344 Hydroprocessing of Materials** (4 cr). Intro to hydroprocessing; dissolution of metals, minerals, and materials; recovery of metals from solutions: solvent extraction, ion exchange, precipitation; electrometallurgy; bioprocessing; design of agitators, mixer-settlers, electrolytic cells; flowsheet design and analysis. Three lec and one 3-hr lab a wk. Prereq: Met 308, 211, 309.

Met **400** (s) **Seminar** (cr arr). Review of current literature. One 3-day field trip. Prereq: perm.

Met **404** (s) **Special Topics** (cr arr).

Met **405 Design of Unit Operations and Flowsheets** (3 cr). Comminution, flotation, leaching, electrowinning, smelting, heat pumps and energy conservation; flowsheet analysis and design. One-week field trip reqd during spring break or at beginning of semester in Christmas recess. Prereq: ES 340, Met 308, 310, 341, 344.

Met **407 Materials Fabrication** (3 cr). Fundamentals of casting, solidification, metal working, and joining of metallic materials; emphasis on interaction between processing, properties, and structure; final problem that covers design of procedure for fabrication of industrial application. One 1-day field trip.

Met **409 Solution Mining** (3 cr). Alt/yrs. Metal extraction from rubblized rock: chem, biol, transport, leaching kinetics, solution flow, aeration, rock permeability and alteration, leaching simulation, environmental containment, safety, metal recovery from solutions; well and reservoir technology; brine evaporation and extraction. Prereq: Chem 111.

Met **412 Mechanical Metallurgy** (3 cr). Mechanical properties of solids, testing, brittle and ductile fracture, plasticity, mechanical processes in metallurgy. One 1-day field trip. Prereq: Met 201 or ME 261.

Met **414 Process Design** (3 cr). Problem definition, flowsheet synthesis, equipment design, economic analysis, optimization and reporting; heuristic and open-ended design problems based on prior minerals, materials, and extractive process courses, economics, and basic and engineering science. Prereq: Min 352, Met 442 and 405.

Met **415 Materials Selection and Design** (3 cr). Selection of materials for use in structural applications; consideration of environment, stress conditions, cost, and performance as guide to properties; optimization of choice of materials and fabrication methods; open-ended problems of real applications in various industries. Prereq: Met 316, 407.

Met **417 X-ray Diffraction** (2-3 cr). Diffraction of x-rays by crystals; applications to study of polycrystalline materials. Two lec and one 3-hr lab a wk. Prereq: Phys 114 or 211.

Met **WS418 Polymeric Materials** (3 cr). Alt/yrs. WSU MSE 402.

Met **WS420 Fracture in Solids** (3 cr). WSU MSE 533.

Met **442 Pyroprocessing of Materials** (4 cr). History of pyroprocessing; hydroprocessing versus pyroprocessing; thermodynamic prin; roasting; sintering; smelting of non-ferrous materials; smelting of ferrous materials; furnaces; flowsheet design and analysis; pyroprocessing of ceramic materials. Three lec and one 3-hr lab a wk. Prereq: Met 211, 308, 309.

Met **443 Mineral Processing Examples** (3 cr). Advanced and new technology examined in depth.

Met **451 Electrometallurgy** (3 cr). Theoretical electrochem, technical electrochem, electrolytics, metal deposition, electrorefining, electrowinning, electrolysis of alkali halides and sulfates, electrothermics.

Met **461 Metallurgical Control and Optimization** (3 cr). Basics of process control and optimization applied to metallurgical engineering.

Met **499** (s) **Directed Study** (cr arr). Prereq: perm.

Met **500 Master's Research and Thesis** (cr arr).

Met **501** (s) **Seminar** (cr arr). Prereq: perm.

Met **502** (s) **Directed Study** (cr arr). Prereq: perm.

Met **503 Advanced Extractive Metallurgy** (3 cr). Topics in the extraction and refining of metals. Prereq: Met 442 or perm.

Met **504** (s) **Special Topics** (cr arr).

Met **505 Advanced Rate Phenomena in Metallurgical Engineering** (3 cr). Principles of rate phenomena in metallurgical engineering. Prereq: perm.

Met **506 Advanced Ore Dressing** (3 cr). Theories of comminution; flotation and related surface phenomena; electrical and magnetic concentration; process control. Prereq: Met 341 or perm.

Met **508 Control of Metallurgical Processes** (3 cr). Control variables of met processes. Prereq: perm.

Met **511 Advanced Physical Metallurgy** (3 cr). Alt/yrs. Theory of metals and alloys; application to problems of structure; properties of engineering metals. Prereq: perm.

Met **512 Metallurgical Thermodynamics** (3 cr). Alt/yrs. Aspects of thermodynamics most used in metallurgy; application to problems. Prereq: perm.

Met **514 Phase Rule and Phase Relations** (3 cr). Alt/yrs. Phase rule construction and interpretation of phase diagrams; metastable and unstable phase relations. Prereq: perm.

Met **515 Unit Operations of Multiphase Separation Processes** (3 cr). Mechanical phase separation froth flotation chem separations at room temperature, high temperature separations, solid/liquid separations.

Met **517 Kinetics of Metallurgical Reactions** (3 cr). Alt/yrs. Application of absolute rate theory; time and temperature dependence; kinetics of gas-solid reactions; corrosion, diffusion, and recrystallization. Prereq: perm.

Met **518 Advanced Mechanical Metallurgy** (3 cr). Alt/yrs. Micro- and macroscopic theories of deformation; materials-forming processes; mechanical tests. Prereq: perm.

Met **522 Surface Reactions of Metals** (3 cr). Alt/yrs. Surface chemistry and physics; illustrative examples from metallurgy. Prereq: perm.

Met **R531 Behavior of Engineering Materials** (3 cr). Static and dynamic properties; relation of mechanical properties to physical properties and crystal imperfections. Prereq: perm.

Met **R533 Advanced X-ray Diffraction** (3 cr). Principles and applications to advanced problems. Prereq: perm.

Met **R534 Radiation Effects in Materials** (3 cr). Interactions between radiation and solids. Prereq: perm.

Met **R535 Failure of Structural Materials** (3 cr). Same as ME 535. Mechanisms by which failure can occur in structural materials. Prereq: ME 261 or Met 201, ES 340.

Met **R536 Theoretical Structural Metallurgy** (3 cr). Structure of metals and alloys; free electron theory; zone theory; equilibrium; order-disorder; kinetics of phase changes and shear processes. Prereq: perm.

Met **R538 Corrosion in Metallurgy** (3 cr). Corrosion by aqueous media, gases, liquid metals, and fused salts. Prereq: physical chemistry, incl electrochemistry, or perm.

Met **R539 Electron Metallography** (3 cr). Alt/yrs. Operation and application in metallurgy of the electron microscope, microprobe, and other instruments applying charged particle optics. Prereq: perm.

Met **WS544 Advanced Topics in Materials Science** (2-3 cr, max 6). WSU MSE 501.

Met **555 Advanced Hydrometallurgical Kinetics** (3 cr). Review of development of chemical kinetics; reaction order determination; classical definition of reaction rates; absolute reaction rate theory; random walk equation; kinetic models, linear, diffusion, mixed kinetics, nucleation; electrochemical kinetics as applied on metal sulfides.

Met **597** (s) **Practicum** (cr arr). Prereq: perm.

Met **598** (s) **Internship** (cr arr). Prereq: perm.

Met **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

MINING ENGINEERING

Min **100 Nonrenewable Resources** (2 cr). Intro to basic concepts of historical, present, and future world energy and mineral needs, land use, and methods of exploitation, conservation of nonrenewable resources, and environmental impact and control.

Min **103 Elements of Mining** (3 cr). Open to nonmajors. Terminology and mining's role in national economics and way of life; includes mineral economics, management, prospecting, discovery, development, exploitation, processing, marketing.

Min **118 Miner Safety Training** (1 cr). A program to provide knowledge and training under Public Law CFR 30, Part 48, Health and Safety Training and Retraining of Miners.

Min **130 Using Programmable Calculators** (2 cr). Writing simple engineering programs for desk-top calculators.

Min **200** (s) **Seminar** (cr arr). Prereq: perm.

Min **204** (s) **Special Topics** (cr arr).

Min **212 Mine Surveying** (2 cr). Triangulation, trilateration, sun and star shots, shaft plumbing, auxiliary telescopes. Prereq: CE 211.

Min **290 Mine Development** (2 cr). Ore deposits, exploration techniques, reserve estimating, and preliminary mine dev studies.

Min **304 Explosives** (2 cr). Drilling and blasting equipment, detonation; use of commercial explosives and detonators; design of blasting rounds (surface and underground). One 1-day field trip. Prereq: jr standing or perm.

Min **306 Industrial Safety** (2 cr). Underground and surface environmental problems of accident and health; statistics, prevention, economy, research on dusts, lighting, rock stability, air, and contaminants. One 2-day field trip.

Min **350 Mineral Economics** (3 cr). Minerals as resources and commodities; importance of minerals, characteristics of their occurrence and production systems, and nature of mineral resources reserves; factors affecting supply and demand, pricing and marketing of mineral materials.

Min **351 Numerical Simulation for Mine Modelling** (4 cr). Applications of operations research theory and practice in mineral industry; deterministic methods, decision theory, and simulation of mining systems. Prereq: jr standing, Math 190, Min 103.

Min **352 Project Investment Analysis and Management** (3 cr). Project organization and management, economic and financial decisions, capital and production cost estimating, equipment selection techniques, operation design optimization, and project selection.

Min **370 Mine Services** (2 cr). Principles and design problems of hoisting, conveying, rail haulage, material transfer, electricity and signaling. One 1-hr lec and one 3-hr design lab a wk; one 4-day field trip. Prereq: Min 103, ES 210, ES 220.

Min **371 Mine Ventilation I: Psychrometrics** (3 cr). First and second laws of thermodynamics; steam tables and the perfect gas; gas-vapour mixtures; psychometric chart; heat, humidity, comfort ratings, cooling; natural ventilation.

Min **372 Mine Ventilation II: Quantity and Quality Control** (3 cr). Gases, dust, airflow, instrumentation, circuits, fans. Prereq: Min 371.

Min **380 Mining Methods Design** (3 cr). Mining methods for coal, metal, and nonmetal with methods of entry and systems design.

Min **400** (s) **Seminar** (cr arr). Prereq: perm.

Min **401 Rock Mechanics** (3 cr). Same as GeolE 407. Basic mechanical properties of rocks and rock masses; lab and in-situ tech to obtain strength, stress distribution, and deformation behavior in rock masses; application of analytical techniques such as the finite element method to design stable mine structures and supporting systems; basic mechanism and new tech of rock fragmentation relating to drilling, blasting, and crushing. Prereq: ES 340.

Min **402 Rock Mechanics Lab** (2 cr). Measuring rock sample strengths; photo elastic and finite element modeling.

Min **404** (s) **Special Topics** (cr arr).

Min **410 Mine Plant Design** (2 cr). Alt/yrs. Mine structures such as headframes, buildings, ore bins, and mechanical devices. Two 3-hr labs a wk; one 1-day field trip. Prereq: ES 340.

Min **420 Mineral Resources Management and the Environment** (3 cr). Factors that must be considered in the management, development, or exploitation of nonrenewable natural resources. One 2-day field trip. Prereq: jr standing.

Min **421 Engineering Geophysics** (3 cr). Same as Geoph 421. Quantitative treatment of surface and borehole geophysics with emphasis on engineering problems. Three 1-day field trips.

Min **422 Principles of General Geophysics** (3 cr). See Geoph 422.

Min **425 Mineral Land Management** (3 cr). See Geog 425.

Min **J428/J528 Geostatistics** (3 cr). See GeolE J428/J528.

Min **450 Mine Planning I** (3 cr). Surface mine design and equipment selection techniques; surface mine design problems.

Min **451 Mine Planning II** (3 cr). Design of systems for underground mines; writing engineering reports. Eight hrs of lab a wk.

Min **453 Mine Drainage and Pumping** (2 cr). Design of drainage and pumping system, including construction drawings and equipment specification. Six hrs of lab a wk.

Min **454 Surface Mine Design** (3 cr). Using advanced computer programs for design and evaluation of open pit and/or strip mines using exploration, geotechnical, mining, and metallurgical data. Prereq: Min 450 or perm.

Min **472 Mineral Industry Case Studies** (3 cr). Same as Geog 492 and Geol 472. Laws, environment, and social issues through definition, evaluation, exploitation, and production of the resource to final sales, transportation economics, and reclamation; specific cases examined by multidisciplinary groups producing a final decision. Prereq: sr standing and perm.

Min **491 Mine Design** (3 cr). Capstone systems design problem solving; integration of previous scientific, mathematical, engineering, social, and mineral information into a simulated or real problem that terminates in a report and presentation. Two 1-hr lec and one 3-hr lab a wk; one 4-day field trip. Prereq: sr standing and perm.

Min **499** (s) **Directed Study** (cr arr). Prereq: perm.

Min **500 Master's Research and Thesis** (cr arr).

Min **501** (s) **Seminar** (cr arr). Prereq: perm.

Min **502** (s) **Directed Study** (cr arr). Prereq: perm.

Min **503 Mine Stress Analysis** (3 cr). Application of techniques in experimental stress analysis for structural design in all phases of the engineering system; photoelastic modeling and coating; strain gauge techniques; stress patterns in frameworks, rock masses, and foundations. One lec and two 3-hr labs a wk. Prereq: ES 340.

Min **504 Rock Mechanics II** (3 cr). Same as GeolE 507. Theories of rupture of elastic and inelastic, brittle materials; mechanisms of fracture propagation and effects in engineering structures and rock fragmentation; effects of nuclear blasting, earthquakes and other dynamic stress waves. Prereq: Min 401 or perm.

Min **505 Design of Mine Structures** (4 cr). Application of experimental stress analysis and the principles of engineering similitude in the design of stable mine structures. One lec and three 3-hr labs a wk. Prereq: Min 401, and 503 or 504.

Min **506** (s) **Special Topics** (cr arr).

Min **510 Mine Plant Design II** (3 cr). Alt/yrs. Practical problems; system synthesis of design of headframes, buildings, bridges, ore bins, road, railroad, and other structures; engineering case methods. Three 3-hr labs a wk. Prereq: Min 103, 410, and ES 340, or perm.

Min **513 Advanced Mine Ventilation I** (3-5 cr). Thermodynamic and motive column analyses of mine airflow. Students who have taken Min 371 and 372 register for 3 cr.

Min **514 Advanced Mine Ventilation II** (3-5 cr). Thermodynamic network analysis; individual projects. Prereq: Min 513.

Min **520 Mining Geophysics** (3 cr). Same as Geoph 521. Alt/yrs. Theory and application of magnetic, electric, electromagnetic, and radioactive methods of geophysical prospecting for metallic and nonmetallic mineral deposits. Two lec and one 3-hr lab a wk; one 3-day field trip. Prereq: perm.

Min **528 Introduction to Geostatistics** (3 cr). See GeolE J428/J528.

Min **530 Mining Exploration Techniques** (3 cr). Alt/yrs. Underground exploration for mining engineers; application of geological, geochemical, geophysical, and statistical methods in exploration; reduction, correlation, and overall interpretation of data; computer applications. Two lec and one 3-hr lab a wk; one 3-day field trip. Prereq: perm.

Min **540 Mine Valuation** (3 cr). Mine examination and valuation; sampling methods and calculations; determining present value of a deposit.

Min **560 Mine Management** (3 cr). Financing, management labor relations, operations, and government regulations. Prereq: perm.

Min **561 Advanced Numerical Simulation for Mine Modeling** (3 cr). Advanced level applications of modeling methods, theory, and practice in minerals industry, including stochastic processes, expert systems, and nonlinear systems. Prereq: sr or grad standing, Min 351, Stat 301.

Min **570 Mine Systems Design** (3-6 cr). Alt/yrs. Integration and synthesis of equipment, methods, and design; use of latest operation research tools to provide a complete mine plan of operation. Prereq: perm.

Min **573 Haulage Systems Design** (3 cr). Alt/yrs. Design criteria in the specification of all pertinent aspects involved in transportation of lump ore on surface or underground. Two lec and one 3-hr lab a wk. Prereq: perm.

Min **597** (s) **Practicum** (cr arr). Prereq: perm.

Min **598** (s) **Internship** (cr arr). Prereq: perm.

Min **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

MINING ENGINEERING-METALLURGY

MinMt **200** (s) **Seminar** (0 cr). Appropriate speakers and unscheduled activities relating to the mineral field. Graded P/F.

MinMt **400** (s) **Seminar** (0 cr). Appropriate speakers and unscheduled activities relating to the mineral field. Graded P/F.

MinMt **600 Doctoral Research and Dissertation** (cr arr). Prereq: enrollment in the composite doctoral program in mining engineering-metallurgy.

Curricular Requirements

METALLURGICAL ENGINEERING (B.S.Met.E.)

As part of a cooperative program with Oregon State University, Oregon resident students may enroll in this program and will NOT be charged out-of-state tuition by UI.

Required course work includes the university requirements (see regulation J-3) and the following:

Note: All students are encouraged to take the eight-hour EIT examination the last semester of their senior year, leading to a Professional Engineering license.

Course	Credits
Met 101 Intro to Metallurgy & Materials Science	1
Met 202 Microstructural Evaluation	2
Met 211 Metallurgical Mass & Energy Balance	3
Met 308 Metallurgical Thermodynamics	3
Met 309 Metallurgical Transport Phenomena	3
Met 310 Metallurgical Reactor Design	3
Met 313, 316 Physical Metallurgy I, II	7
Met 341 Particulate Materials Processing	4
Met 344 Hydroprocessing of Materials	4
Met 405 Design of Unit Operations & Flowsheets	3
Met 407 Materials Fabrication	3
Met 414 Process Design	3
Met 415 Materials Selection & Design	3
Met 442 Pyroprocessing of Materials	4
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chem & Qual Analysis or 114 General Chem	4-5
Chem 305 Physical Chemistry	3
CS 112 Introduction to Problem Solving & Programming or 105 FORTRAN Programming for Engineers	2-3
EE 207 Introduction to Electrical Engineering	3
Engr 101 Engineering Graphics	2
ES 210 Engineering Statics	3
ES 340 Mechanics of Materials	3
Eng 317 Technical & Engineering Report Writing	3
Geol 260 Survey of Minerals	2
Math 180, 190, 200 Analytic Geometry & Calculus	11
Math 310 Ordinary Differential Equations	3
ME 261 Engineering Materials	3
Min 352 Project Investment Analysis & Management	3
Phys 210, 211, 212, 213 Engineering Physics I, II & Lab	8
Stat 301 Probability & Stat or ES 402 Applied Numerical Methods	3
Humanities and social sc electives to meet the core and ABET requirements	18
Technical electives	3
Science electives	3

The minimum number of credits for the degree is 133.

MINING ENGINEERING (B.S.Min.E.)

As part of a cooperative program with Oregon State University, Oregon resident students may enroll in this program and will NOT be charged out-of-state tuition by UI.

Required course work includes the university requirements (see regulation J-3) and the following:

Note: Approved field experience, appropriate summer employment, or an applied course in mine surveying and geologic mapping is required before graduation. All students are encouraged to take the eight-hour EIT examination the last semester of their senior year, leading to a Professional Engineer license.

Course	Credits
Min 103 Elements of Mining	3
Min 118 Miner Safety Training	1
Min 130 Using Programmable Calculators	2
Min 212 Mine Surveying	2
Min 290 Mine Development	2
Min 351 Numerical Simulation for Mine Modelling	4
Min 352 Project Investment Analysis & Management	3
Min 370 Mine Services	2
Min 371, 372 Mine Ventilation I, II	6
Min 401, 402 Rock Mechanics & Lab	5
Min 450, 451 Mine Planning I, II	6
Min 491 Mine Design	3
Chem 111 Principles of Chemistry	4
Chem 114 General Chemistry	4
CE 211 Engineering Measurements	4
EE 207 Introduction to Electrical Engineering	3
EE 324 Electrical Machinery	3
Engr 101 Engineering Graphics	2
ES 210 Engineering Statics	3
ES 220 Engineering Dynamics	3
ES 320 Fluid Mechanics	3
ES 340 Mechanics of Materials	3
Eng 317 Technical & Engineering Report Writing	3
Geol 101, 102 Physical Geology & Lab	4
Geol 260 Survey of Minerals	2
Geol 345 Structural Geology	3
Math 180, 190, 200 Analytic Geometry & Calculus	11
Math 310 Ordinary Differential Equations	3
Met 205 Introduction to Metallurgy	3
Phys 210, 211 Engineering Physics I, II	6
Stat 301 Probability & Statistics	3
Humanities and social sciences electives	16
Design electives chosen from the following	4
Min 410 Mine Plant Design	
Min 453 Mine Drainage & Pumping	
Min 454 Surface Mine Design	
Min 472 Mineral Industry Case Studies	
GeoIE 428 Geostatistics	
GeoIE 435 Geological Engineering Principles	
GeoIE 436 Geological Engineering Design	
Technical electives (approved by dept)	4

The minimum number of credits for the degree is 136.

Academic Minor Requirements

METALLURGICAL ENGINEERING MINOR

Course	Credits
Met 309 Metallurgical Transport Phenomena	3
Met 310 Metallurgical Reactor Design	3
ES 210 Engineering Statics	3
Math 310 Ordinary Differential Equations	3
ME 261 Engineering Materials	3
And one of the following sets of courses:	
Met 202 Microstructural Evaluation	2
Met 313, 316 Physical Metallurgy I & II	7
Phys 211 Engineering Physics II	3
or	
Met 211 Metallurgical Mass & Energy Balance	3
Met 341 Particulate Materials Processing	4
Met 344 Hydroprocessing of Materials	4
Chem 112 Inorganic Chem & Qual Analysis or 114 General Chem	4-5

MINING ENGINEERING MINOR

Course	Credits
Min 103 Elements of Mining	3
Min 118 Miner Safety Training	1
Min 401 Rock Mechanics	3
Min 450 Mine Planning I	3
Courses selected from the following	8
Min 304 Explosives	
Min 352 Project Investment Analysis & Management	
Min 370 Mine Services	
Min 372 Mine Ventilation II	
Min 451 Mine Planning II	
Min 472 Mineral Industry Case Studies	
Min 491 Mine Design	

Department of Military Science

Dutch Pullmann, Dept. Head (West End, Mem. Gym.). Faculty: Bruce K. Baker, Dale A. Hedman, Doug W. Krehbiel, David R. Pollard, Dutch Pullmann.

Army ROTC, as represented at UI by the Department of Military Science, is the major source of commissioned officers for the U.S. Army. After successfully completing the program and baccalaureate degree requirements in almost any field, the student receives a commission as a second lieutenant. At this time active duty is not a requirement but is something for which students compete. Graduates also choose from among 26 different branches or specialties. Those not choosing active duty serve with the Army Reserves or Army National Guard on a part-time basis. Two-, three-, and four-year scholarships are available.

All levels of course work combine classroom instruction with practical exercises in the field or on the drill floor. The basic course, consisting of a one-credit course each freshman semester and a two-credit course each sophomore semester, is designed to provide men and women with information on what it would be like to be an officer in the Army on active duty or in the National Guard or Army Reserve. The two-year basic curriculum covers an Army career, military history, map reading, leadership, first aid, and small unit operations. Students may voluntarily participate in one of several adventure activities. Basic-course students, other than scholarship students, do not make a military commitment during this period. These students survey Army opportunities and decide whether to continue in the program as advanced-course students.

The advanced course consists of a three-credit course normally taken each semester during the last two years of university study and includes a six-week advanced camp at Fort Lewis, Washington. Students in the advanced course receive monthly stipends of $100 during the school year. Study centers on leadership styles and techniques with special emphasis placed on small-unit leadership.

The primary objective of the program is to develop leadership and management skills in students. Supplementary objectives include enhancement of the student's abilities in speaking and writing, goal seeking, and problem solving. Key to the program is the development of personal attributes essential to military science. Those attributes include sound situational assessment, decision making, and the ability to know, understand, and lead people. Additionally, the department hopes to cultivate within its students a strong sense of personal integrity, self-discipline, and responsibility.

Prior to commissioning all cadets must demonstrate proficiency in written communications, human behavior, military history, computer literacy, and math reasoning. This may be achieved through taking UI course offerings in those subject areas. See your Army ROTC class adviser for a list of approved courses.

Departmental members will answer questions about specific programs and courses. Contact the department by going to the west end of Memorial Gymnasium or by calling 208/885-6528 (collect if out of state).

Military Science Courses

MS **101 Introduction to Military Science** (1 cr). Provides background in role of an Army officer as a career choice in either the Active Army or the National Guard/Reserves; lec, conference, and activities dealing with military subjects; option of participating in challenging outdoor activities such as whitewater rafting, mountaineering, and weapons familiarization; no military obligation; texts and lab fees provided by dept; no mandatory uniform wear; students also learn about available two- and three-year scholarships and other financial programs for which they may be eligible.

MS **102 Fundamentals of Leadership and Management** (1 cr). Continuation of MS 101. Development of greater understanding of roles and responsibilities of Army officers; lec, conference, and activities dealing with military subjects; participation in challenging outdoor activities such as orienteering, mountaineering, and weapons qualification; occasional uniform wear reqd; no military obligation; texts, uniforms, and lab fees provided by dept. Prereq: MS 101 or perm of professor of military sc.

MS **201 Applied Leadership and Management** (2 cr). Application of leadership and management skills to various case studies; organization and structure of Army units; basic first aid; practical field training in variety of outdoor skills (mountaineering, rafting rifle marksmanship); uniform wear reqd; no military obligation; texts, uniforms, and lab fees provided by dept. Prereq: MS 102 or perm of dept.

MS **202 Applied Leadership and Management** (2 cr). Troop leading procedures and application of procedures to planning and conducting small unit operations; individual soldier skills, such as military communication, radio procedures, basic map reading, and survival skills; practical field training in variety of outdoor skills (mountaineering, rafting, rifle marksmanship); uniform wear reqd; no military obligation; texts, uniforms, and lab fees provided by dept. Prereq: MS 201 or perm of dept.

MS **204** (s) **Special Topics** (cr arr).

MS **205 Fundamentals and Applied Leadership and Management (Compressed)** (4 cr). Compression of MS 101-102, 201-202. Leadership training, command experience, organization and employment of basic military units, map reading, and unit leadership problems. Three lec and one 2-hr lab a wk. May not be taken for cr after 101, 102, 201, or 202. Prereq: 2nd-sem soph or 1st-sem jr standing and perm of dept.

MS **280 Raider Operations** (1 cr, max 4). The Chrisman Raider Team is an elite group of individuals who compete on intercollegiate level in military skills of marksmanship, physical fitness, navigation, weapons, rope bridging, and long distance marching; rigorous physical training and practicing technical skills in preparation for two-day competition among schools throughout western U.S. Coreq: another MS course.

MS **289 Basic Encampment** (3 cr). Comprehensive course in basic soldiering skills in conjunction with leadership evaluation and development; six wks in Fort Knox, Kentucky; commercial air, room, and board provided plus $700; no obligation incurred before or after completion—students may withdraw at any time; graduates are eligible for advanced military sc. Prereq: 26 cr hrs, 2.0 GPA, good physical condition, meet medical and ethical criteria, and perm of dept head.

MS **299** (s) **Directed Study** (cr arr). Prereq: perm.

MS **301-302 Advanced Leadership and Management** (3 cr). Practical leadership skills in light infantry environment; leadership techniques practiced while learning patrolling and offensive and defensive tactics at squad and platoon level; prepares cadets for six-wk Advanced Camp at Fort Lewis, Washington. Three hrs of lec, 2 hrs of lab, and 3 hrs of physical training a wk, plus field training exercises. Prereq: either ROTC Basic Course, Camp Challenge, or Basic Training for active Army, National Guard, or Reserves.

MS **WS385 History of Modern Warfare** (3 cr). WSU Hist and Mil S 385.

MS **401-402 Seminar in Leadership and Management** (3 cr). Practical application of leadership and management skills, military justice system, administrative and logistical procedures; prep for active duty. Prereq: MS 301-302.

MS **471-472 Command and Staff Functions** (2 cr). Hands-on practical applications of functions of U.S. Army officers assigned to command and staff positions; planning, coordinating, and implementing operations, training and logistic support for cadet battalion activities; practical exercises in interrelationships between commander, staff, higher headquarters, and subordinate units. Coreq; MS 401-402.

MS **489 Advanced Encampment** (cr arr). Intensive six-wk summer encampment at Ft. Lewis, Washington. Graded P/F. Prereq: MS 301-302 and perm of dept.

MS **499** (s) **Directed Study** (cr arr). Prereq: perm.

MINING ENGINEERING—see Department of Metallurgical and Mining Engineering

MINING ENGINEERING-METALLURGY—see Department of Metallurgical and Mining Engineering

Lionel Hampton School of Music

Robert W. Miller, Director (205 Music Bldg.). Faculty: Dorothy T. Barnes, Robert S. Billups, Daniel J. Bukvich, J. Roger Cole, Robert Dickow, Mary H. DuPree, Alan J. Gemberling, Richard R. Hahn, Tim King, Ronald J. Klimko, G. Jay Mauchley, Sandra Mauchley, Robert T. McCurdy, Robert W. Miller, Richard S. Neher, James E. Reid, Lynn J. Skinner, Robert J. Spevacek, Charles W. Walton, William C. Wharton.

The Lionel Hampton School of Music, so designated in 1987 in honor of the eminent American composer, conductor, and performer, is a full member of the National Association of Schools of Music. Established as a department in 1893, it was elevated to school status in 1969.

The courses and curricula in music seek to prepare elementary, secondary, and college teachers of music; to train professional musicians; to enrich the cultural environment for the students and provide liberal-arts instruction; and to do research in music performance and teaching for the general benefit of the public and the discipline of music.

Students in this school learn by performing, listening, analyzing, and creating music. Emphasis is on the understanding of musical style and techniques of all eras, including contemporary music. Mu-

sical studies balance the aesthetic and the practical, with ample opportunity for exploration and self-reliance.

The formal curricula of the school consist of baccalaureate-degree programs in vocal or instrumental performance, vocal or instrumental music education (including a combined degree in both), composition, and elementary music. The B.A. degree emphasizes a broad liberal education and is offered with majors in applied music (performance), music history and literature, and music theory. The B.Mus. degree is professionally oriented, and is the normal preparation for graduate study in music or for teacher certification.

The Music Building houses the Agnes Crawford Schuldt Music Library, faculty studios, ensemble rehearsal areas, classrooms, a music education materials center, a record and tape listening center, and a recital hall. Individual practice rooms are available in nearby Ridenbaugh Hall. Recording, radio-television, language listening lab, and computer facilities of the campus are also used by music students. In addition to organ, harpsichord, and piano practice instruments, the school maintains two performance pipe organs, three concert grand pianos, and a concert harpsichord.

The Hampton School offers degrees at the master's level—M.Mus. and M.A. Master of Music degrees are available in performance (vocal and instrumental), composition, theory-composition, music literature, music education, and piano pedagogy and performance studies. The Master of Arts option is in music history.

Courses

APPLIED PERFORMANCE STUDIES

MusA **114** (s) **Individual Instruction** (1 cr, max arr). For secondary or minor instrument, nonmajors, and undeclared majors; may not be taken for audit. One-half hour of private instruction a wk. Instruction offered in piano, organ, harpsichord, voice, flute, oboe, clarinet, saxophone, bassoon, trumpet, horn, euphonium, trombone, tuba, percussion, violin, viola, cello, contrabass, guitar, or harp. Prereq: audition by committee.

MusA **124** (s) **Individual Instruction** (2 cr, max arr). For music majors in music degree programs other than performance; may not be taken for audit. One hour of private instruction a wk plus convocation studio class; final exam conducted by jury. See MusA 114 for instruction areas. Prereq: placement audition by committee.

MusA **134** (s) **Individual Instruction** (3 cr, max arr). For applied music majors in the B.Mus. performance degree; may not be taken for audit. One hour of private instruction a wk plus convocation studio class; final exam conducted by jury. See MusA 114 for instruction areas. prereq: placement audition by committee.

MusA **145-146/245-246 Piano Class** (1 cr). May not be taken for audit. Four-semester beginning piano sequence. Two lec-labs a wk. Prereq: perm of dept.

MusA **147-148 Voice Class** (1 cr). May not be taken for audit. Two-semester sequence for beginning singers. Two lec-labs a wk. Prereq: MusA 147 (for 148) or perm of dept.

MusA **J149-J150/J349-J350 Voice for Actors** (1 cr, max arr). Group voice instruction based on theatre and musical theatre materials. Prereq: audition and perm of dept.

MusA **151-152 Guitar Class** (1 cr). Two lec-labs a wk. May not be taken for audit. Prereq: perm of dept.

MusA **153 Guitar Class for Nonmajors** (2 cr). Group instruction in guitar and basic musicianship. May not be taken for audit.

MusA **200** (s) **Seminar** (cr arr). Prereq: perm.

MusA **203** (s) **Workshop** (cr arr). Prereq: perm.

MusA **204** (s) **Special Topics** (cr arr).

MusA **245-246 Piano Class** (1 cr). See MusA 145-146/245-246.

MusA **299** (s) **Directed Study** (cr arr). Prereq: perm.

MusA **314** (s) **Individual Instruction** (1 cr, max arr). See MusA 114 for description.

MusA **J315/J515 Accompanying** (1 cr, max arr). Principles of accompanying with use of keyboard instruments; lab assignments under supervision. Two lec-labs a wk. Prereq: audition and completion of semester of MusA 124 or 134.

MusA **J316/J516 Concert Choir—Vandaleers** (1 cr, max arr). Open to all students. Four rehearsals a wk. Prereq: audition and perm.

MusA **J317/J517** (s) **University Choir** (1 cr, max arr). Open to all students. One 2-1/2 hr night rehearsal a wk. Prereq: perm.

MusA **J318/J518** (s) **Jazz Choir** (1 cr, max arr). Open to all students. Three rehearsals a wk. Prereq: audition and perm.

MusA **J319/J519** (s) **Marching Band** (1 cr, max arr). Open to all students. Performance at home football games and other events and travel to selected away football games; separate sections for marching band and Vandal Brass. Prereq: audition and perm.

MusA **J320/J520** (s) **Wind Ensemble** (1 cr, max arr). Open to all students. Four rehearsals a wk. Prereq: audition and perm.

MusA **J321/J521** (s) **Concert Band** (1 cr, max arr). Open to all students. Three rehearsals a wk. Prereq: audition and perm.

MusA **J322/J522** (s) **Orchestra** (1 cr, max arr). Open to all students. Four rehearsals a wk. Prereq: audition and perm.

MusA **J323/J523** (s) **Jazz Ensemble** (1 cr, max arr). Open to all students. Three rehearsals a wk. Prereq: audition and perm.

MusA **324** (s) **Individual Instruction** (2 cr, max arr). See MusA 124 for description.

MusA **334** (s) **Individual Instruction** (3 cr, max arr). See MusA 134 for description.

MusA **349-350 Voice for Actors** (1 cr, max arr). See MusA J149-J150/J349-J350.

MusA **J365/J565** (s) **Chamber Ensemble** (1 cr, max arr). Open to all students. Performance opportunities in chamber ensembles: string, brass, woodwind, percussion, keyboard, vocal, and mixed including Chamber Singers, Collegium Musicum, brass choir, percussion ensemble. Two rehearsals a wk. Prereq: audition and perm.

MusA **J380/J580** (s) **Opera Workshop** (1-3 cr, max arr). Analysis, rehearsal, and performance of operatic literature. Prereq: audition and perm.

MusA **387 Conducting I** (2 cr). Conducting techniques, score reading, and interpretation of scores for large choral and instrumental ensembles. Prereq: MusC 141.

MusA **400** (s) **Seminar** (cr arr). Prereq: perm.

MusA **403** (s) **Workshop** (cr arr). Prereq: perm.

MusA **404** (s) **Special Topics** (cr arr).

MusA **J454/J554 Performance Practices** (2 cr). Performance practices of music from Renaissance to present. Prereq: perm.

MusA **487 Conducting II** (2 cr). Prereq: MusA 387 or perm.

MusA **490 Recital** (0 cr). For students required to have one-half recital. Graded P/F. Prereq: perm of dept; coreq: MusA 324 or 334.

MusA **491 Recital** (0 cr). For students required to have a full recital. Graded P/F. Prereq: perm of dept; coreq: MusA 334.

MusA **498 Proseminar** (2 cr). Prereq: perm.

MusA **499** (s) **Directed Study** (cr arr). Prereq: perm.

MusA **500 Master's Research and Thesis** (cr arr).

MusA **501** (s) **Seminar** (cr arr). Prereq: perm.

MusA **502** (s) **Directed Study** (cr arr). Prereq: perm.

MusA **503** (s) **Workshop** (cr arr). Prereq: perm.

MusA **504** (s) **Special Topics** (cr arr).

MusA **514** (s) **Individual Instruction** (1 cr, max arr). See MusA 114 for description.

MusA **515 Accompanying** (1 cr, max arr). See MusA J315/J515.

MusA **516 Concert Choir—Vandaleers** (1 cr, max arr). See MusA J316/J516.

MusA **517** (s) **University Choir** (1 cr, max arr). See MusA J317/J517.

MusA **518** (s) **Jazz Choir** (1 cr, max arr). See MusA J318/J518.

MusA **519** (s) **Marching Band** (1 cr, max arr). See MusA J319/J519.

MusA **520** (s) **Wind Ensemble** (1 cr, max arr). See MusA J320/J520.

MusA **521** (s) **Concert Band** (1 cr, max arr). See MusA J321/J521.

MusA **522** (s) **Orchestra** (1 cr, max arr). See MusA J322/J522.

MusA **523** (s) **Jazz Ensemble** (1 cr, max arr). See MusA J323/J523.

MusA **524** (s) **Individual Instruction** (2-3 cr, max arr). See MusA 124 for description.

MusA **534** (s) **Individual Instruction** (3-6 cr, max arr). See MusA 134 for description.

MusA **554 Performance Practices** (2 cr). See MusA J454/J554.

MusA **565** (s) **Chamber Ensemble** (1 cr, max arr). See MusA J365/J565.

MusA **580 Opera Workshop** (1-3 cr, max arr). See MusA J380/J580.

MusA **587 Advanced Conducting** (3 cr). Advanced techniques of conducting including baton techniques and score reading analysis. Prereq: MusA 387 or equiv.

MusA **590** (s) **Master's Recital** (0 cr). For students whose emphasis is other than performance. May be repeated. Graded P/F. Prereq: audition and perm of committee; coreq: MusA 524.

MusA **591** (s) **Master's Recital** (0 cr). For students whose emphasis is in performance. May be repeated. Graded P/F. Prereq: audition and perm of committee; coreq: MusA 534.

MusA **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

THEORY AND COMPOSITION

MusC **120 Fundamentals of Music** (2 cr). For students in fields other than music. Not open to students who have taken MusC 141.

MusC **139-140 Aural Skills I-II** (1 cr). Exercises and drill in sight-singing and ear training.

MusC **141 Theory of Music I** (3 cr). For majors and minors. Melodic and harmonic materials, part-writing skills, and analysis. Prereq: perm of dept.

MusC **142 Theory of Music II** (3 cr). For majors and minors. Harmonic materials, part-writing skills, and analysis. Prereq: MusC 141.

MusC **200** (s) **Seminar** (cr arr). Prereq: perm.

MusC **203** (s) **Workshop** (cr arr). Prereq: perm.

MusC **204** (s) **Special Topics** (cr arr).

MusC **239-240 Aural Skills III-IV** (1 cr). Continuation of MusC 140.

MusC **241 Theory of Music III** (3 cr). For majors and minors. Prereq: MusC 142.

MusC **242 Theory of Music IV** (3 cr). For majors and minors. Prereq: MusC 241.

MusC **299** (s) **Directed Study** (cr arr). Prereq: perm.

MusC **324 Composition for Noncomposition Majors** (2 cr, max 4). Study of techniques of composition; phrase and period structure, melodic composition and accompaniment, composition of small forms. Prereq: MusC 242.

MusC **325 Composition** (2 cr, max arr). Creative writing. Prereq: MusC 240, 242.

MusC **327 Orchestration** (3 cr). Principles of instrumentation and transcription with emphasis on idiomatic instrumental writing leading to projects in scoring for chamber groups, orchestra, and band. Prereq: MusC 242 or perm.

MusC **329 Theoretical Basis of Jazz** (2 cr). Harmonic, melodic, rhythmic, and stylistic analysis of principal trends. Prereq: perm.

MusC **331 Counterpoint** (3 cr). Style and technique of polyphonic 16th century vocal music through 18th century instrumental music, with emphasis on two- to three-part writing; motet, canon, invention, and fugue. Prereq: MusC 242 or perm.

MusC **400** (s) **Seminar** (cr arr). Prereq: perm.

MusC **403** (s) **Workshop** (cr arr). Prereq: perm.

MusC **404** (s) **Special Topics** (cr arr).

MusC **425 Advanced Composition** (2 cr, max arr). Continuation of MusC 325. Increasing emphasis on varied media and larger forms, but with value being placed on creativity and originality. Prereq: MusC 325.

MusC **426 Electronic Music** (2 cr). Techniques of musical composition using electronic media. Prereq: MusC 242 or perm.

MusC **428 Choral Arranging** (2 cr). Techniques and devices used in arranging for voice ensembles. Prereq: MusC 242 or perm.

MusC **J432/J532 Advanced Counterpoint** (2 cr). Advanced contrapuntal writing, including canon and fugue. Additional projects/assignments reqd for grad cr. Prereq: MusC 331.

MusC **441 20th-Century Techniques** (2 cr). Compositional techniques of 20th century; composition and analytical project. Prereq: MusC 242.

MusC **442 Musical Analysis** (2 cr). Study of traditional forms and analytical techniques. Prereq: MusC 242.

MusC **461 Band Arranging** (2-4 cr, max 4). Alt/yrs. Scoring for wind and percussion instruments; range, transposition, and tone color. Prereq: MusC 242 or perm.

MusC **490 Senior Recital** (0 cr). For students in composition required to have one-half recital. Prereq: perm of dept; coreq: MusC 425.

MusC **498 Proseminar** (2 cr). Prereq: perm.

MusC **499** (s) **Directed Study** (cr arr). Prereq: perm.

MusC **500 Master's Research and Thesis** (cr arr).

MusC **501** (s) **Seminar** (cr arr). Prereq: perm.

MusC **502** (s) **Directed Study** (cr arr). Prereq: perm.

MusC **503** (s) **Workshop** (cr arr). Prereq: perm.

MusC **504** (s) **Special Topics** (cr arr).

MusC **507 Individual Instruction: Composition** (cr arr). Prereq: MusC 525 or perm.

MusC **521 Musical Analysis** (3 cr). Analysis of selected musical compositions. Prereq: perm.

MusC **525 Composition** (2 cr, max arr). Creative writing.

MusC **527 Advanced Orchestration** (2 cr, max arr). Orchestral scoring; recent trends. Prereq: MusC 327 or perm.

MusC **532 Advanced Counterpoint** (2 cr). See MusC J432/J532.

MusC **590** (s) **Master's Recital** (0 cr). For students whose degree requires a composition recital as part of the degree requirements. Graded P/F. Prereq: audition and perm of committee; coreq: MusC 507 or 525.

MusC **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

HISTORY AND LITERATURE

MusH **100** (s) **Survey of Music** (2-3 cr). Satisfies core requirement J-3-d. Not open for cr to majors or to those who have taken MusC 141. Intro to the art and nature of music; emphasis on aural skills, historical styles, musical forms, and the literature of music.

MusH **101 Introduction to Music** (2 cr). Intro to art and nature of music; representative world musical cultures and overview of Western vernacular and cultivated traditions.

MusH **200** (s) **Seminar** (cr arr). Prereq: perm.

MusH **203** (s) **Workshop** (cr arr). Prereq: perm.

MusH **204** (s) **Special Topics** (cr arr).

MusH **299** (s) **Directed Study** (cr arr). Prereq: perm.

MusH **304 Special Topics in Music History** (2-3 cr). Primarily for nonmajors. Music in context of general cultural history; studies of genres or style periods.

MusH **321 Music in Western Civilization I** (3 cr). Musical culture, styles, and genres from the Middle Ages through 1750. Prereq: MusH 100, 101, or perm.

MusH **322 Music in Western Civilization II** (3 cr). European and American musical culture, styles, and genres from 1750 to World War I. Prereq: MusH 100, 101, or perm.

MusH **323 Music in Western Civilization III** (3 cr). European and American musical cultures, styles, and genres, including jazz, from World War I to the present. Prereq: MusH 100, 101, or perm.

MusH **400** (s) **Seminar** (cr arr). Prereq: perm.

MusH **403** (s) **Workshop** (cr arr). Prereq: perm.

MusH **404** (s) **Special Topics** (cr arr).

MusH **J410/J510** (s) **Studies in Jazz History** (3 cr). Selected topics in jazz. Additional projects/assignments reqd for grad cr. Prereq: MusH 321-323 or perm.

MusH **J416/J516** (s) **Studies in Renaissance Music** (3 cr). Selected topics in Renaissance music. Additional projects/assignments reqd for grad cr. Prereq: MusH 321-323 or perm.

MusH **J417/J517** (s) **Studies in Baroque Music** (3 cr). Selected topics in Baroque music. Additional projects/assignments reqd for grad cr. Prereq: MusH 321-323 or perm.

MusH **J418/J518** (s) **Studies in Classic/Romantic Music** (3 cr). Selected topics in Classic/Romantic music. Additional projects/assignments reqd for grad cr. Prereq: MusH 321-323 or perm.

MusH **J419/J519** (s) **Studies in 20th-Century Music** (3 cr). Selected topics in 20th-century music. Additional projects/assignments reqd for grad cr. Prereq: MusH 321-323 or perm.

MusH **J440/J540** (s) **Studies in American Music** (3 cr). Selected topics in American music. Additional projects/assignments reqd for grad cr. Prereq: MusH 321-323 or perm.

MusH **J451/J551** (s) **Repertoire** (2 cr, max arr). May be repeated for cr as content changes. Historical and analytical survey of literature available in all performing media. Additional projects/assignments reqd for grad cr. Prereq: jr standing and perm.

MusH **J459/J559** (s) **Studies in Opera Literature** (3 cr). Open to all students. Selected masterworks of opera literature. Additional projects/assignments reqd for grad cr. Prereq: perm.

MusH **498 Proseminar** (2 cr). Prereq: perm.

MusH **499** (s) **Directed Study** (cr arr). Prereq: perm.

MusH **500 Master's Research and Thesis** (cr arr).

MusH **501** (s) **Seminar** (cr arr). Prereq: perm.

MusH **502** (s) **Directed Study** (cr arr). Prereq: perm.

MusH **503** (s) **Workshop** (cr arr). Prereq: perm.

MusH **504** (s) **Special Topics** (cr arr).

MusH **510** (s) **Studies in Jazz History** (3 cr). See MusH J410/J510.

MusH **516** (s) **Studies in Renaissance Music** (3 cr). See MusH J416/J516.

MusH **517** (s) **Studies in Baroque Music** (3 cr). See MusH J417/J517.

MusH **518** (s) **Studies in Classic/Romantic Music** (3 cr). See MusH J418/J518.

MusH **519** (s) **Studies in 20th-Century Music** (3 cr). See MusH J419/J519.

MusH **540** (s) **Studies in American Music** (3 cr). See MusH J440/J540.

MusH **551** (s) **Repertoire** (2 cr, max arr). See MusH J451/J551.

MusH **559** (s) **Studies in Opera Literature** (3 cr). See MusH J459/J559.

MusH **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

MUSIC TEACHING

MusT **200** (s) **Seminar** (cr arr). Prereq: perm.

MusT **203** (s) **Workshop** (cr arr). Prereq: perm.

MusT **204** (s) **Special Topics** (cr arr).

MusT **251 String Instrument Techniques** (1 cr). Group instruction. Problems of playing and teaching stringed instruments in elementary and secondary schools. Prereq: perm.

MusT **252 Clarinet Techniques** (1 cr). Group instruction. Problems of playing and teaching clarinet in elementary and secondary schools. Prereq: perm.

MusT **253 Brass Instrument Techniques** (1 cr). Group instruction. Problems of playing and teaching brass instruments in elementary and secondary schools. Prereq: perm.

MusT **254 Percussion Techniques** (1 cr). Group instruction. Problems of playing and teaching percussion instruments in elementary and secondary schools. Prereq: perm.

MusT **299** (s) **Directed Study** (cr arr). Prereq: perm.

MusT **351 Advanced String Techniques** (1 cr). Group instruction. Prereq: MusT 251 or perm.

MusT **352 Double Reed Techniques** (1 cr). Group instruction. Prereq: MusT 252 or perm.

MusT **353 Advanced Brass Techniques** (1 cr). Group instruction. Prereq: MusT 253 or perm.

MusT **354 Flute and Saxophone Techniques** (1 cr). Group instruction. Prereq: MusT 252 or perm.

MusT **381 Elementary School Music Methods I** (3 cr). Same as Ed 381. Curriculum, organization, and instructional materials for teaching general classroom music. Two lec and one lab a wk. Must be taken before enrolling in Ed 432. Prereq: perm.

MusT **383 Principles of Music Teaching** (3 cr). Students in the School of Music take this course in lieu of Ed 468. Philosophy, principles, curriculum, and organization of the school music program. Must be taken before enrolling in Ed 432. Prereq: MusC 142.

MusT **385 Choral Music in the Secondary School** (2 cr). Methods, instructional materials, and techniques for teaching choral music in grades 7-12. Two lec and one lab a wk. Must be taken before enrolling in Ed 432. Prereq: 2 cr in MusA 316 or 317, MusC 142; prereq or coreq: MusT 383, MusA 387, or perm.

MusT **386 Instrumental Music in the Secondary School** (2 cr). Methods, instructional materials, and techniques for teaching instrumental music in grades 7-12. Two lec and one lab a wk. Must be taken before enrolling in Ed 432. Prereq: MusC 142; prereq or coreq: MusT 383, MusA 387, or perm.

MusT **387 Orff Schulwerk** (2 cr). Philosophies and music teaching techniques attributed to Carl Orff with emphasis on creative movement, singing, improvisation, and percussion instruments. Prereq: perm.

MusT **388 Kodaly Method** (2 cr). Philosophies and teaching sequence (based on the development of the child) of Zoltan Kodaly with emphasis on solfege singing, folk songs, child development lesson planning, and development of personal musicianship. Prereq: perm.

MusT **400** (s) **Seminar** (cr arr). Prereq: perm.

MusT **403** (s) **Workshop** (cr arr). Prereq: perm.

MusT **404** (s) **Special Topics** (cr arr).

MusT **J435/J535** (s) **Pedagogy and Materials** (2 cr, max arr). Methods and materials of performance techniques for each performance field. Additional projects/assignments reqd for grad cr. Prereq: jr standing and perm.

MusT **438** (s) **Practicum** (cr arr). Studio and classroom teaching of secondary music majors, minors, or electives. Prereq: perm.

MusT **465 Jazz Band Rehearsal Techniques** (1 cr). Methods, materials, and literature for jazz bands in public schools. Coreq: MusT 466, 467.

MusT **466 Marching Band Techniques** (1 cr). Techniques of drilling; materials for field and street maneuvers; preparation of shows. Prereq: MusC 242; coreq: MusT 465, 467.

MusT **467 Instrumental Literature for Public Schools** (1 cr). Music and materials suitable for instrumental ensembles in schools. Prereq: MusT 465, 466.

MusT **468 Literature for Vocal Ensembles** (2 cr). Chamber music materials suitable for use in schools.

MusT **481 Elementary School Music Methods II** (3 cr). Prereq: MusT 381 or perm.

MusT **485 Choral Ensemble Rehearsal Techniques** (1 cr, max arr). Various techniques of rehearsing singers in an ensemble. Coreq: MusT 385.

MusT **486 Instrumental Ensemble Rehearsal Techniques** (1 cr, max arr). Various techniques of rehearsing string, wind, and percussion players in an ensemble. Coreq: MusT 386.

MusT **498 Proseminar** (2 cr). Prereq: perm.

MusT **499** (s) **Directed Study** (cr arr). Prereq: perm.

MusT **500 Master's Research and Thesis** (cr arr).

MusT **501** (s) **Seminar** (cr arr). Prereq: perm.

MusT **502** (s) **Directed Study** (cr arr). Prereq: perm.

MusT **503** (s) **Workshop** (cr arr). Prereq: perm.

MusT **504** (s) **Special Topics** (cr arr).

MusT **505 Curriculum Development** (3 cr). Scope and sequence of musical experience in public schools through curriculum development.

MusT **506 Teaching Systems** (3 cr). For experienced teachers. Survey of Orff, Kodaly, Gordon, and Manhattanville and their relationship to teaching music at all levels. Prereq: one yr teaching experience or perm.

MusT **507 Evaluation in Music** (3 cr). Study and development of evaluation instruments for use in teaching music.

MusT **535** (s) **Pedagogy and Materials** (2 cr, max arr). See MusT J435/J535.

MusT **538** (s) **Practicum** (cr arr). Studio and classroom teaching of secondary music majors, minors, or electives. Prereq: perm.

MusT **562 Choral Literature and Techniques** (2 cr). Prereq: MusT 385, MusA 387, or perm.

MusT **563 Orchestral Literature and Techniques** (2 cr). Prereq: MusT 386, MusA 387, or perm.

MusT **564 Band Literature and Techniques** (2 cr). Prereq: MusT 386, MusA 387, or perm.

MusT **581** (s) **College Music Teaching** (1 cr, max 3). Contemporary teaching techniques in one or more of the following fields: theory, music literature, music education, piano, voice, woodwinds, strings, brass, and percussion. Prereq: perm.

MusT **583 School Music Administration** (2 cr). Principles underlying sound policies in the supervision and administration of school music. Prereq: one yr of teaching experience or perm.

MusT **597** (s) **Practicum** (cr arr). Prereq: perm.

MusT **598** (s) **Internship** (cr arr). Prereq: perm.

MusT **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

GENERAL

MusX **140 Convocation** (0 cr). Required of all music majors for seven semesters and music minors for two semesters (minimum of 10 recitals a semester). Graded P/F.

MusX **200** (s) **Seminar** (cr arr). Prereq: perm.

MusX **203** (s) **Workshop** (cr arr). Prereq: perm.

MusX **204** (s) **Special Topics** (cr arr).

MusX **283-284** (s) **Diction for Singers** (2 cr). Two-semester sequence (English/Italian and German/French) in study of language sounds as represented by the International Phonetic Assoc.

MusX **299** (s) **Directed Study** (cr arr). Prereq: perm.

MusX **400** (s) **Seminar** (cr arr). Prereq: perm.

MusX **403** (s) **Workshop** (cr arr). Prereq: perm.

MusX **404** (s) **Special Topics** (cr arr). Prereq: perm.

MusX **469 Research Techniques in Music** (2 cr). Principles of research design and techniques. Prereq: perm.

MusX **498 Proseminar** (2 cr). Prereq: perm.

MusX **499** (s) **Directed Study** (cr arr). Prereq: perm.

MusX **500 Master's Research and Thesis** (cr arr).

MusX **501** (s) **Seminar** (cr arr). Prereq: perm.

MusX **502** (s) **Directed Study** (cr arr). Prereq: perm.

MusX **503** (s) **Workshop** (cr arr). Prereq: perm.

MusX **504** (s) **Special Topics** (cr arr).

MusX **511 Bibliography and Research** (3 cr). Orientation to grad study; bibliography and research procedures.

MusX **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Curricular Requirements

General Requirements for All B.A. and B.Mus. Degrees

Ensemble Participation. An undergraduate major in the School of Music is required to enroll in an ensemble during each semester. Various requirements are contained in the specific curricula, depending on the performance specialty. Consult the School of Music Handbook for further details.

Keyboard Proficiency. Minimum keyboard proficiency for all B.Mus. majors is met by satisfactory completion of MusA 145-146, 245-246, Piano Class, or by passing a keyboard proficiency examination or for B.A. majors by satisfactory completion of MusA 145 or by passing a keyboard proficiency test.

Academic Junior Standing (AJS). Each major in the School of Music must be admitted to AJS by the music faculty before he or she will be permitted to enroll in music courses at the 300 level. Normally, this occurs during the first semester of the sophomore year, when the music faculty will meet to determine a list of students who have achieved satisfactory levels in music academic course work and may be admitted to AJS. Unsatisfactory achievement will result in probationary status and/or a recommendation to drop the major. Transfer students may not be admitted into AJS until 12 hours have been completed at the university, during which time the student was enrolled as a major in the School of Music; however, a transfer student may enroll in 300-level courses before being admitted to AJS if the normal sequence of courses would justify this procedure.

Upper-Division Standing (UDS). For an undergraduate music education or music performance major to enroll in MusA 324 or 334 respectively, or for a composition major to enroll in MusC 325, the student must have passed the requirements of the major area; this involves a special jury examination and demonstration of mastery of the fundamentals of the student's major area of performance/composition and the potential to continue improving in a manner that will lead to the successful completion of performance/composition requirements of the degree and major emphasis.

Convocation-Recital Attendance. Because listening experiences constitute an area of major importance in the study of music, all music majors and music minors are required to register for MusX 140, Convocation; music majors must attend 10 recitals a semester for seven semesters and music minors must attend 10 recitals a semester for two semesters. Recital credit will not be granted for those performances in which a student participates. In addition, music majors must attend the weekly convocation series (studio, area, and convocation). Students will not be admitted to academic junior standing until they

have passed three semesters of convocation. (Admittance to AJS normally occurs after the first semester of the sophomore year.) Transfer students are expected to enroll in MusX 140 during their first registration, and to receive a passing grade in a specific number of semesters (to be determined when the student's program is set up). Students must attend a full concert or program in order for it to be counted toward convocation-recital requirements.

MUSIC: APPLIED MUSIC (B.A.)

Required course work includes the university requirements (see regulation J-3), the L & S requirements for the B.A. degree, and:

Course	Credits
MusA 124 Individual Instruction	8
MusA 145 Piano Class	1
MusA 324 Individual Instruction	8
MusA 490 Recital (half)	0
MusC 139-140, 239-240 Aural Skills	4
MusC 141, 142, 241, 242 Theory of Music	12
MusH 101 Introduction to Music	2
MusH 321, 322, 323 Music in Western Civilization	9
MusX 140 Convocation (seven semesters)	0
Music history electives (upper-division)	2-3
Music theory electives (upper-division)	2-3
Electives to complete 50 cr in music	3-4
Electives to total 128 cr for the degree (incl at least 78 cr in nonmusic courses)	—

MUSIC: HISTORY AND LITERATURE (B.A.)

Required course work includes the university requirements (see regulation J-3), the L & S requirements for the B.A. degree, and:

Course	Credits
MusA 114 Individual Instruction	4
MusA 145 Piano Class	1
MusA 314 Individual Instruction	4
MusC 139-140, 239-240 Aural Skills	4
MusC 141, 142, 241, 242 Theory of Music	12
MusH 101 Introduction to Music	2
MusH 321, 322, 323 Music in Western Civilization	9
MusX 140 Convocation (seven semesters)	0
Music history electives (upper-division)	4-6
Music theory electives (upper-division)	4
Electives to complete 50 cr in music	4-6
Electives to total 128 cr for the degree (incl at least 78 cr in nonmusic courses)	—

MUSIC: THEORY (B.A.)

Required course work includes the university requirements (see regulation J-3), the L & S requirements for the B.A. degree, and:

Course	Credits
MusA 114 Individual Instruction	4
MusA 145 Piano Class	1
MusA 314 Individual Instruction	4
MusC 139-140, 239-240 Aural Skills	4
MusC 141, 142, 241, 242 Theory of Music	12
MusH 101 Introduction to Music	2
MusH 321, 322, 323 Music in Western Civilization	9
MusX 140 Convocation (seven semesters)	0
Music theory electives (upper-division)	10
Electives to complete 50 cr in music	4
Electives to total 128 cr for the degree (incl at least 78 cr in nonmusic courses)	—

MUSIC: INSTRUMENTAL PERFORMANCE (B.Mus.)

Required course work includes the university requirements (see regulation J-3) and the specific requirements in one of the two sections below. It is strongly recommended that instrumentalists elect literature or pedagogy courses appropriate to their major fields.

A. KEYBOARD

Note: Keyboard majors must pass the class piano proficiency exam or register for the appropriate level of class piano until the proficiency exam is passed.

Course	Credits
MusA 134 Individual Instruction	12
MusA 334 Individual Instruction	12
MusA 315 Accompanying	4
MusA 365 Chamber Ensemble	2
MusA 387 Conducting	2
MusA 454 Performance Practices	2
MusA 490 Recital (half)	0
MusA 491 Recital (full)	0
MusC 139-140, 239-240 Aural Skills	4
MusC 141, 142, 241, 242 Theory of Music	12
MusC 331 Counterpoint	3
MusC 442 Musical Analysis	2
MusH 101 Introduction to Music	2
MusH 321, 322, 323 Music in Western Civilization	9
MusH 451 Repertoire	4
MusT 435 Pedagogy & Materials	4
MusX 140 Convocation (seven semesters)	0
Music history electives	3
Large ensemble (two different semesters chosen from MusA 316, 317, 318, 319, 320, 321, 322)	2
Music electives to complete 84 cr in music	5
Electives to total 128 cr for the degree	—

B. ORCHESTRAL INSTRUMENTS OR GUITAR

Course	Credits
MusA 134 Individual Instruction	12
MusA 145-146, 245-246 Piano Class	4
MusA 334 Individual Instruction	12
MusA 387 Conducting I	2
MusA 454 Performance Practices	2
MusA 490 Recital (half)	0
MusA 491 Recital (full)	0
MusC 139-140, 239-240 Aural Skills	4
MusC 141, 142, 241, 242 Theory of Music	12
MusC 331 Counterpoint	3
MusC 442 Musical Analysis	2
MusH 101 Introduction to Music	2
MusH 321, 322, 323 Music in Western Civilization	9
MusH 451 Repertoire	2
MusT 435 Guitar Pedagogy & Materials (guitar majors only)	2
MusX 140 Convocation (seven semesters)	0
Music history elective	3
Large ensemble (eight different semesters chosen from MusA 320, 321, 322) (4 cr in four different semesters reqd for guitar majors, which may also be chosen from MusA 316, 317, 319)	8
Chamber music (two different semesters chosen from MusA 323, 365) (4 cr in four different semesters of MusA 365, Guitar Ensemble, reqd for guitar majors)	2
Music electives to complete 84 cr in music	5
Electives to total 128 cr for the degree	—

MUSIC: VOCAL PERFORMANCE (B.Mus.)

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
MusA 134 Individual Instruction	12
MusA 145-146, 245-246 Piano Class	4
MusA 334 Individual Instruction	12
MusA 380 Opera Workshop	2
MusA 387 Conducting	2
MusA 454 Performance Practices	2
MusA 490 Recital (half)	0
MusA 491 Recital (full)	0
MusC 139-140, 239-240 Aural Skills	4
MusC 141, 142, 241, 242 Theory of Music	12
MusC 331 Counterpoint	3
MusC 442 Musical Analysis	2
MusH 101 Introduction to Music	2
MusH 321, 322, 323 Music in Western Civilization	9
MusH 451 Repertoire	2
MusT 435 Pedagogy & Materials	2
MusX 140 Convocation (seven semesters)	0
Foreign language (two years of one language or one year each of two languages)	16
Music history electives	3
Large ensemble (six different semesters chosen from MusA 316, 317)	6
Chamber music (two different semesters chosen from MusA 318, 365)	2
Music electives to complete 84 cr in music	3
Electives to total 128 cr for the degree	—

MUSIC: COMPOSITION (B.Mus.)

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
MusA 114 Individual Instruction (if major performing medium is other than piano, piano is suggested for the minor area)	2
MusA 124 Individual Instruction	8
MusA 145-146, 245-246 Piano Class	4
MusA 324 Individual Instruction	4
MusA 387 Conducting	2
MusC 139-140, 239-240 Aural Skills	4
MusC 141, 142, 241, 242 Theory of Music	12
MusC 325 Composition	4
MusC 327 Orchestration	3
MusC 331 Counterpoint	3
MusC 425 Advanced Composition	4
MusC 426 Electronic Music	2
MusC 428 Choral Arranging	2
MusC 442 Musical Analysis	2
MusC 490 Recital	0
MusH 101 Introduction to Music	2
MusH 321, 322, 323 Music in Western Civilization	9
MusX 140 Convocation (seven semesters)	0
Music history elective	3
Large ensemble (eight different semesters chosen from MusA 316, 317, 319, 320, 321, 322)	8
Chamber music (two different semesters chosen from MusA 318, 323, 365) (one semester of MusA 315, Accompanying, is reqd of students whose major applied medium is keyboard)	2

Music electives to complete 84 cr in music....4
Electives to total 128 cr for the degree....—

MUSIC EDUCATION: VOCAL (B.Mus.)

The professional education courses required in partial fulfillment of this degree are in the process of change. Contact the Hampton School of Music for specific course and requirement information.

NOTE: For registration in upper-division courses in education, students must have been admitted to the teacher education program and maintain a GPA of 2.5. For admission criteria, refer to "Admission to the Teacher Education Program" in the College of Education section of part four of this catalog.

Required course work includes the university requirements (see regulation J-3) and completion of one of the two sections below:

A. PREPARATION FOR JR.-SR. HIGH SCHOOL MUSIC TEACHING

Course	Credits
MusA 114 Individual Instruction (voice for piano majors; piano for voice majors)*	4
MusA 314 Individual Instruction (voice for piano majors; piano for voice majors)*	2
MusA 124 Individual Instruction	8
MusA 151 or 152 Guitar Class	1
MusA 324 Individual Instruction	6
MusA 380 Opera Workshop	1
MusA 387, 487 Conducting	4
MusA 490 Recital (half)	0
MusC 139-140, 239-240 Aural Skills	4
MusC 141, 142, 241, 242 Theory of Music	12
MusC 428 Choral Arranging	2
MusH 101 Introduction to Music	2
MusH 321, 322, 323 Music in Western Civilization	9
MusT 381 Elementary School Music Methods	3
MusT 383 Principles of Music Teaching	3
MusT 385 Choral Music in Secondary School	2
MusT 435 Pedagogy & Materials	2
MusT 485 Choral Ensemble Rehearsal Techniques	1
MusX 140 Convocation (seven semesters)	0
MusX 283-284 Diction for Singers	4
Ed 201 Introduction to Teaching	2
Ed 312 Educational Psychology	2
Ed 314 Strategies for Teaching	2
Ed 340 Methods of Teaching Content Reading	3
Ed 432 Practicum: Music Teaching	9
Ed 445 Proseminar in Teaching	3
Psych 100 Introduction to Psychology	3
Large ensemble (six different semesters chosen from MusA 316, 317)	6
Other ensemble (one semester chosen from MusA 316, 317, 318, 365, 380)	1
Music electives to complete 84 cr in music (students whose major performing medium is keyboard must register for two semesters of MusA 315, Accompanying)	3-7
Electives to total 128 cr for the degree	—

*Keyboard majors must pass the piano class proficiency exam or register for the appropriate level of piano class until the piano class proficiency exam is passed. Voice majors must register for piano class (or pass the proficiency exam) before enrolling in applied piano instruction; any combination of piano class or applied piano (MusA 114/314) should equal a minimum of six credits.

B. PREPARATION FOR ELEMENTARY SCHOOL MUSIC TEACHING

Course	Credits
MusA 114 Individual Instruction (voice for piano majors; piano for voice majors)*	4
MusA 314 Individual Instruction (voice for piano majors; piano for voice majors)*	2
MusA 124 Individual Instruction	8
MusA 324 Individual Instruction	6
MusA 145-146, 245-246 Piano Class	4
MusA 151 or 152 Guitar Class	1
MusA 387 Conducting I	2
MusA 490 Recital (half)	0
MusC 139-140, 239-240 Aural Skills	4
MusC 141, 142, 241, 242 Theory of Music	12
MusC 428 Choral Arranging	2
MusH 101 Introduction to Music	2
MusH 321, 322, 323 Music in Western Civilization	9
MusT 381, 481 Elementary School Music Methods	6
MusT 383 Principles of Music Teaching	3
MusT 387 Orff Schulwerk	2
MusT 388 Kodaly Method	2
MusX 140 Convocation (seven semesters)	0
Ed 201 Introduction to Teaching	2
Ed 314 Strategies for Teaching	2
Ed 328 Audiovisual Aids	1
Ed 432 Practicum: Music Teaching	9
Ed 436 Reading: Alternatives to Basals	3
Ed 445 Proseminar in Teaching	3
Psych 100 Introduction to Psychology	3
Psych 305 Developmental Psychology	3
ThA 381 Drama in Education	3
Large ensemble (six different semesters)**	6
Other ensemble (two different semesters chosen from MusA 316, 317, 318, 319, 320, 321, 322, 323, 380) (two semesters of MusA 315, Accompanying, is reqd of students whose major applied medium is keyboard)	2
Music electives to complete 84 cr in music	7
Electives to total 128 cr for the degree	—

*Keyboard majors must pass the piano class proficiency exam or register for the appropriate level of piano class until the piano class proficiency exam is passed. Voice majors must register for piano class (or pass the proficiency exam) before enrolling in applied piano instruction; any combination of piano class or applied piano should equal a minimum of six credits. If the major instrument is other than voice, a minimum of six credits is required in any combination of class voice (MusA 147-148) or applied voice (MusA 114).

**Students must register for a large ensemble in accordance with their respective major performing medium as follows: wind and percussion—MusA 319, 320, 321; strings—MusA 322; voice—MusA 316, 317; keyboard—MusA 316, 317.

MUSIC EDUCATION: INSTRUMENTAL (B.Mus.)

The professional education courses required in partial fulfillment of this degree are in the process of change. Contact the Hampton School of Music for specific course and requirement information.

NOTE: For registration in upper-division courses in education, students must have been admitted to the teacher education program and maintain a GPA of 2.5. For admission criteria, refer to "Admission to the Teacher Education Program" in the College of Education section of part four of this catalog.

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
MusA 124 Individual Instruction	8
MusA 145-146, 245-246 Piano Class	4
MusA 324 Individual Instruction	6
MusA 387, 487 Conducting	4
MusA 490 Recital (half)	0
MusC 139-140, 239-240 Aural Skills	4
MusC 141, 142, 241, 242 Theory of Music	12
MusC 327 Orchestration or 461 Band Arranging	3
MusH 101 Introduction to Music	2
MusH 321, 322, 323 Music in Western Civilization	9
MusT 251, 252, 253, 254, 351, 352, 353, 354 Instrumental Techniques	8
MusT 381 Elementary School Music Methods	3
MusT 383 Principles of Music Teaching	3
MusT 386 Instrumental Music in Secondary School	2
MusT 465 Jazz Band Rehearsal Techniques	1
MusT 466 Marching Band Techniques	1
MusT 467 Instrumental Literature for Public Schools	1
MusT 486 Instrumental Ensemble Rehearsal Techniques	1
MusX 140 Convocation (seven semesters)	0
Ed 201 Introduction to Teaching	2
Ed 312 Educational Psychology	2
Ed 314 Strategies for Teaching	2
Ed 340 Methods of Teaching Content Reading	3
Ed 432 Practicum: Music Teaching	9
Ed 445 Proseminar in Teaching	3
Psych 100 Introduction to Psychology	3
Large ensembles (six different semesters)*	6
Other ensembles (two different semesters chosen from MusA 319, 320, 321, 322, 323, 365) (students whose major applied medium is keyboard must select MusA 315 to satisfy this requirement)	2
Music electives to complete 84 cr of music	4
Electives to total 128 cr for the degree	—

*The large ensemble requirement must be completed in six different semesters; wind and percussion majors must register for three different semesters of MusA 319 and three different semesters of MusA 320 or 321. Wind and percussion majors may, by audition, substitute two semesters of MusA 322 for 320 or 321. String majors must register for six different semesters of MusA 322. Wind, percussion, and string majors must have a total of four semesters of large ensemble participation (as defined above) at UI.

MUSIC EDUCATION: VOCAL-INSTRUMENTAL (B.Mus.)

The professional education courses required in partial fulfillment of this degree are in the process of change. Contact the Hampton School of Music for specific course and requirement information.

NOTE: For registration in upper-division courses in education, students must have been admitted to the teacher education program and maintain a GPA of 2.5. For admission criteria, refer to "Admission to the Teacher Education Program" in the College of Education section of part four of this catalog.

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
MusA 114 Individual Instruction (voice)	2
MusA 124 Individual Instruction	8
MusA 145-146, 245-246 Piano Class	4
MusA 147-148 Voice Class	2
MusA 324 Individual Instruction	6
MusA 387, 487 Conducting	4
MusA 490 Recital (half)	0
MusC 139-140, 239-240 Aural Skills	4
MusC 141, 142, 241, 242 Theory of Music	12

MusC 327 Orchestration or 461 Band Arranging	3
MusC 428 Choral Arranging	2
MusH 101 Introduction to Music	2
MusH 321, 322, 323 Music in Western Civilization	9
MusT 251, 252, 253, 254, 351, 352, 353, 354 Instrumental Techniques	8
MusT 381 Elementary School Music Methods	3
MusT 383 Principles of Music Teaching	3
MusT 385 Choral Music in Secondary School	2
MusT 386 Instrumental Music in Secondary School	2
MusT 465 Jazz Band Rehearsal Techniques	1
MusT 466 Marching Band Techniques	1
MusT 467 Instrumental Literature for Public Schools	1
MusT 485 Choral Ensemble Rehearsal Techniques	1
MusT 486 Instrumental Ensemble Rehearsal Techniques	1
MusX 140 Convocation (seven semesters)	0
Ed 201 Introduction to Teaching	2
Ed 312 Educational Psychology	2
Ed 314 Strategies for Teaching	2
Ed 340 Methods of Teaching Content Reading	3
Ed 432 Practicum: Music Teaching	9
Ed 445 Proseminar in Teaching	3
Psych 100 Introduction to Psychology	3
Large ensembles (six different semesters)*	6
Large ensembles (two different semesters chosen from MusA 316, 317)	2
Other ensembles (two different semesters chosen from MusA 319, 320, 321, 322, 323, 365) (students whose major applied medium is keyboard must select MusA 315 to satisfy this requirement)	2
Electives to total 128 cr for the degree	—

*The large ensemble requirement must be completed in six different semesters; wind and percussion majors must register for three different semesters of MusA 319 and three different semesters of MusA 320 or 321. Wind and percussion majors may, by audition, substitute two semesters of MusA 322 for 320 or 321. String majors must register for six different semesters of MusA 322. Wind, percussion, and string majors must have a total of four semesters of large ensemble participation (as defined above) at UI.

Academic Minor Requirements

MUSIC MINOR

Course	Credits
MusA 114 Individual Instruction	4
MusA 145-146 Piano Class	2
MusC 139-140 Aural Skills I-II	2
MusC 141-142 Theory of Music I-II	6
MusH 101 Introduction to Music	2
MusH 321, 322 Music in Western Civilization	6
MusX 140 Convocation (2 semesters)	0
Music electives	4

Department of Naval Science

Thomas H. Anderson, Dept. Head (101 Navy Bldg.). Faculty: Thomas H. Anderson, Vernon J. Moses, Alan R. Neuenfeldt, Hugh F. Sheehy, Thomas N. Tabbert, Robert J. Walzer.

The President and the Congress of the United States have charged the Department of the Navy with the responsibility of maintaining freedom of passage on the world's seas. This task has become increasingly important in recent years because our country has become more and more dependent on importing a multitude of raw materials to support our industries, along with many manufactured products and foodstuffs. In turn, we are also economically dependent on exporting our products to foreign nations. Transportation by sea has risen in importance because it is by far the most economical means to date.

Protection of these sea lanes is paramount to our country's survival, and it is incumbent on the Department of the Navy to have as its leaders men and women who are highly educated in a variety of fields. For this reason, UI offers a Navy/Marine Corps Officer Education Program (NOEP), the main goal of which is to prepare students for commissions as ensigns in the Navy or as second lieutenants in the Marine Corps.

Besides the academic program, students have the opportunity to participate in a variety of social and athletic events. Additionally, field trips to Navy and Marine Corps facilities are arranged periodically in order to allow members the opportunity of learning more about the naval service.

Students in NOEP are in either the college program or the scholarship program. College-program students are fully integrated within the battalion. College-program students in advanced standing (junior year) receive a monthly stipend for four semesters. Scholarship programs are varied.

The NOEP offers scholarships and programs leading to commissions as Navy or Marine Corps officers. Normally, students enter the program at the beginning of the freshman year; however, selected students may enter later, up to the beginning of the junior year. Students take 20 credits of professional courses taught by Navy and Marine Corps officers. Special provision for meeting freshman and sophomore requirements is made for students who enter the program in their junior year. Following graduation, a broad variety of duty assignments is available to the newly commissioned officer, including duty on nuclear submarines and surface ships, in naval aviation, supply corps, civil engineering corps, and ground or aviation assignments in the Marine Corps. All commissionees normally go on active duty at full pay and allowances immediately upon graduation.

Scholarship Program. Application for this program is normally made during the fall of the student's senior year of high school or freshman year of college. Initial selections are based on college entrance examination scores (SAT or ACT) and high school academic performance. Scholarship benefits include tuition, fees, books, and a $100-per-month retainer. A student on scholarship participates in three summer training cruises of four to six weeks' duration. The first and third cruises are aboard ships of the Pacific or Atlantic Fleet and often include travel to Europe or the Far East. During the second cruise, students are introduced to submarine, amphibious warfare, aviation specialties, and Marine Corps occupational specialities. During summer cruises, the students receive one-half the pay of an ensign, in addition to room and board. Graduates of this program are commissioned as regular officers in the Navy or Marine Corps.

College Program. Application for this program is made directly to the head of the Department of Naval Science. Students receive their uniforms and naval science textbooks at no cost and begin receiving monthly subsistence pay of $100 per month at the beginning of the junior year. College program students may be nominated by the professor of naval science to the chief of naval education and training for a scholarship, if their grades and military aptitude marks are sufficient. The program requires one training cruise during the summer following the junior year. It is an afloat cruise of the same type and with the same pay as described for the scholarship program. Graduates of this program are ordered to active duty with reserve commissions.

Marine Corps Option. Both scholarship and college program students who desire a Marine Corps commission may apply for the Marine Corps option during their first two years in college. Students taking this option enroll in specialized classes on Marine Corps subjects during their junior and senior years and participate in summer training at the Officer Candidate School at Quantico, Virginia, during the summer following their junior year.

Two-Year Program. Navy-Marine Corps applicants entering the program after completion of their sophomore year will be required to attend the Naval Science Institute (NSI) during the summer between their sophomore and junior years. At the NSI they will study the material taken by the four-year candidates during their freshman and sophomore years. On completion of NSI, candidates return to the university and complete the junior and senior years of the naval science curriculum with their peers. Candidates in the two-year program will participate in one afloat cruise between their junior and senior years. Applications must be submitted early in the second semester of the sophomore year. The top NSI graduates are awarded scholarships for their last two years of college; the remaining graduates receive substance ($100).

Naval Science Courses

NS **ID100 Drill/Lab** (0 cr). WSU N S 100. Reqd of all Navy-Marine Corps OEP students. Two 1-hr labs a wk.

NS **ID101 Introduction to Naval Science** (2 cr). WSU N S 101. Intro to the Navy: customs, structure, career paths, ship and aircraft of the U.S. Fleet.

NS **ID102 Ships Systems I** (3 cr). WSU N S 102. Intro to Naval shipboard engineering systems; propulsion systems; nuclear, gas turbine, and conventional; auxiliary systems and shipboard damage control; basic concepts in ship design.

NS **ID110 Basic Sail Training** (0 cr). WSU N S 110. Intro to small sailboat handling and safety, principles of sailing, basic procedures and terminology; includes limited on-water practice when boats are available. Graded P/F. Four classroom sessions, 1 session in UI pool, and 2-5 sailing sessions (Saturdays). Prereq: perm.

NS **200** (s) **Seminar** (cr arr). Prereq: perm.

NS **ID201 Ships Systems II** (3 cr). WSU N S 201. Naval weapons systems; theory and process of detection (radar and sonar), evaluation; weapons; delivery, guidance, and explosives; integration of weapons systems with command, control, and communications systems.

NS **ID202 Seapower and Maritime Affairs** (2 cr). WSU N S 202. Survey of U.S. Naval history; seapower and maritime affairs emphasizing present-day concerns; comparisons of U.S. and Russian Naval strategies.

NS **299** (s) **Directed Study** (cr arr). Prereq: perm.

NS **ID301 Navigation** (3 cr). WSU N S 301. Theory, principles, and procedures of terrestrial, celestial, and electronic navigation.

NS **ID302 Naval Operations** (3 cr). WSU N S 302. Naval operations and tactics, relative motion, and "rules of the nautical road." Prereq: enrolled in NOEP.

NS **ID311 Evolution of Warfare** (3 cr). WSU N S 311. Evolution of war through tactics; strategy from Sun Tzu to J.F.C. Fuller.

NS **400** (s) **Seminar** (cr arr). Prereq: perm.

NS **ID401 Naval Organization and Management** (2 cr). WSU N S 401. Theories of management and management resources, motivational theories, and leadership.

NS **ID402 Naval Leadership** (2 cr). WSU N S 402. Naval administration, emphasizing the U.C.M.J., human resource management, material management, and supply systems.

NS **ID412 Amphibious Operations** (3 cr). WSU N S 412. Amphibious doctrine from Gallipoli to the Mayaguez.

NS **ID451 Navy Flight Indoctrination** (2 cr). WSU N S 451. Intro to Naval aviation emphasizing navigation, aerodynamics, engineering, weather, flight safety, and duties of naval aviators and flight officers.

NS **499** (s) **Directed Study** (cr arr). Prereq: perm.

Curricular Requirements

NAVAL SCIENCE (B.N.S.)

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
NS 101 Introduction to Naval Science	2
NS 102 Ships Systems I	3
NS 201 Ships Systems II	3
NS 202 Seapower & Maritime Affairs	2
NS 301 Navigation	3
NS 302 Naval Operations	3
NS 401 Naval Organization & Management	2
NS 402 Naval Leadership	2
CS 112 Introduction to Problem Solving & Programming	3
Hist 455 20th Century Europe	3
Math 180, 190 Analytic Geometry & Calculus I, II	8
Phys 113-114 General Physics	6
Phys 115 or 116 General Physics Lab	1

A naval science student must complete at least 80 percent of the requirements toward another university degree, as approved by the dean of the college concerned.

A student in naval science who concurrently qualifies for both the B.N.S. degree and another university degree will be awarded only the other university degree.

The awarding of the B.N.S. degree is administered through the College of Letters and Science; however, the academic records of the student concerned remain with the college in which he or she is registered for the regular baccalaureate degree.

Academic Minor Requirements

NAVAL SCIENCE MINOR

Course	Credits
NS 101 Intro to Naval Science	2
NS 102, 201 Ships Systems I, II	6
NS 202 Seapower & Maritime Affairs	2
Four to six courses from the following	10
NS 301 Navigation	
NS 302 Naval Operations	
NS 311 Evolution of Warfare	
NS 401 Naval Organization & Management	
NS 402 Naval Leadership	
NS 412 Amphibious Operations	
NS 451 Navy Flight Indoctrination	

Nuclear Engineering

E. Clark Lemmon, Program Director (202 Gauss Lab.). Faculty: Jasper R. Avery, Thomas E. Carleson, Donald F. Elger, Joseph J. Feeley, E. Clark Lemmon, Alan G. Stephens.

RELATED FIELDS: For other courses offered in the nuclear field, see Chem 416, Chem 513, Phys 465, and Phys 566.

Nuclear Engineering Courses

NE **R120 Fundamental Concepts of Nuclear Engineering** (3 cr). Basic concepts; intro to atomic structure, nuclear reactions, fission process, nuclear reactor fundamentals and types.

NE **R220 Analysis of Nuclear Engineering Systems I** (3 cr). Primarily for technologists. Elementary quantitative analysis, with emphasis on the qualitative aspects of nuclear engineering systems; ore processing, fuel element fabrication, materials selection, shielding, and control. Prereq: NE 120 or perm.

NE **R221 Analysis of Nuclear Engineering Systems II** (3 cr). Primarily for technologists. Continuation of NE R220. Heat removal, reactor design, fuel recycle, and waste disposal. Prereq: NE 220 or perm.

NE **360 Nuclear Engineering** (3 cr). Atomic and nuclear physics; reactor system physics and heat transfer. Prereq: ES 320, Math 310.

NE **404** (s) **Special Topics** (cr arr).

NE **460 Nuclear Reactor Engineering** (3 cr). Nuclear reactor design problems in thermodynamics, fluid flow, heat transfer, fuel preparation, waste disposal, and materials selection; disc of reactor types. Prereq: NE 360 or perm.

NE **R462 Nuclear Reactor Codes and Standards** (3 cr). Same as ITED 464. ASME nuclear codes and standards; their contribution to nuclear power plant design and operation. (Cr in this course may not be counted toward a degree.)

NE **R470 Nuclear Reactor Safety** (3 cr). Light water reactor safety: evaluation methods, system disturbances, safety criteria, containment, NRC licensing process, and computer codes for nuclear safety analysis; intro to liquid metal safety. Prereq: perm.

NE **R500 Master's Research and Thesis** (cr arr).

NE **R501** (s) **Seminar** (cr arr). Prereq: perm.

NE **502** (s) **Directed Study** (cr arr). Prereq: perm.

NE **R530 Two-Phase Flow** (3 cr). Treatment of fluid mechanics and heat transfer in conjunction with nuclear reactors where two-phase flow problems are found.

NE **R540 Fusion Energy** (3 cr). Basic concepts and experimental approaches to fusion, elem plasma theory, plasma oscillations, heating; fusion reactor technology development and long range prospects.

NE **R550 Topics in Advanced Nuclear Engineering** (3 cr). Prereq: perm.

NE **R565 Reactor Engineering** (3 cr). Radiation shielding, materials, instrumentation and controls, separation of stable isotopes, chem separation and processing, special techniques. Prereq: Phys 566 or perm.

NE **R580 Waste Management and Nuclear Fuel Reprocessing** (3 cr). Head-end processing, solvent extraction processes, ion exchange processes, precipitation processes, and effluent disposal.

NE **581 Treatment of Radioactive Waste** (3 cr). Alternative processes and operations for treatment of radioactive wastes before long-term storage. Prereq: Math 310, ES J475/J575, NE 360 or Phys 587.

Department of Philosophy

Marvin C. Henberg, Dept. Chair (407 Morrill Hall). Faculty: Kathryn P. George, Nicholas F. Gier, Barbara E. Hannan, Marvin C. Henberg. Adjunct Faculty: Raymond Dacey, Jack Kulas.

Philosophy examines the grounds of knowledge, the nature of reality, and the nature of value, justice, and morality. It asks fundamental questions about how we reason and how we ought to reason. Its subject matter encompasses all the other academic disciplines, indeed all areas of human experience—society, values, mind, language, art, and science.

The main value of philosophy, then, lies in its contributions to a liberal education. Its vocational value (except for philosophy teachers) depends on its connections with other fields: formal logic is close to mathematics; ethics, social philosophy, and logic are useful to prospective students of business, law, and the social sciences; aesthetics, ethics, and the history of philosophy are of interest to students of literature and the other arts; metaphysics is related to both religion and science; and theory of knowledge and philosophy of science have a bearing on psychology and the natural sciences.

Philosophy Courses

Phil **101 Ethics** (3 cr) (C). Satisfies core requirement J-3-d. Dev of ethical thought.

Phil **103 Problems of Philosophy** (3 cr). Nature of philosophy through critical examination of basic beliefs in such areas as foundations of knowledge, nature of reality, existence of God, and conduct of life.

Phil **111 World Religions** (2-3 cr). Overview of major world religions with special attention to similarities and differences in their conceptions of man and his relation to nature and to the divine.

Phil **204** (s) **Special Topics** (cr arr).

Phil **206 Death and Dying** (2-3 cr). The ways philosophical outlooks and belief systems affect attitudes toward death and the treatment of the dying.

Phil **207 Biomedical Ethics** (2-3 cr). Consideration of problems posed by the development of new medical technology and legal rights assigned persons from the view of major relevant moral traditions such as Aristotlean, Utilitarian, Kantian, and Natural Law theories.

Phil **211 Logic** (3 cr). Methods of reasoning; function of logic in the methods of science. Prereq: Phil 103 or soph standing.

Phil **305 Philosophy of Religion** (3 cr). Philosophical investigation of religious issues such as the existence and attributes of God, the problems of free will and evil, nature of religious language, creation and evolution.

Phil **306 Hinduism, Jainism, and Zoroastrianism** (3 cr). Philosophy and religion of Zoroaster, the Vedas, the Upanishads, the Bhagavad Gita, Jainism, and later Hindu thought.

Phil **307 Buddhism** (3 cr). Philosophy and religion of Gautama Buddha as it developed in India, Tibet, China, and Japan.

Phil **308 Confucianism and Taoism** (3 cr). Historical survey of two major philosophies.

Phil **ID&WS309 History of Ancient Philosophy** (3 cr) (C). WSU Phil 300. Philosophical thought from the early Greeks through the Middle Ages; concentration on metaphysics and theory of knowledge.

Phil **ID&WS310 History of Modern Philosophy** (3 cr) (C). WSU Phil 305. Philosophical and political thought from Descartes through Kant.

Phil **311 Metaphysics** (3 cr). Classical and contemporary readings on such items as realism versus nominalism, free will and determinism, the nature of causality, the existence of God, personal identity, modality.

Phil **400** (s) **Seminar** (cr arr). Prereq: perm.

Phil **401 Philosophy of the Arts** (3 cr). Chief conceptions of the nature of the arts and their interpretation.

Phil **WS402 Seminar in Symbolic Logic** (3 cr). WSU Phil 401. Alt/yrs.

Phil **403 Advanced Logic** (3 cr). Ideas and technology of contemporary logic.

Phil **404** (s) **Special Topics** (cr arr).

Phil **ID410 Philosophy of Law** (3 cr). WSU Phil 470. Examination of selected topics pertaining to moral and philosophical evaluation of law.

Phil **ID&WS411 Social Philosophy** (3 cr). WSU Phil 445. Philosophical theories of the origin and nature of society and of the state.

Phil **ID&WS412 Philosophy of Science** (3 cr). WSU Phil 425. Basic concepts of modern science.

Phil **ID&WS414 Ethical Theory** (3 cr). WSU Phil 460. Main points of view.

Phil **415-416** (s) **Twentieth Century Philosophy** (3 cr). Movements and figures of the 20th century such as logical positivism, linguistic analysis, Russell, Wittengenstein, Heidegger, and Merleau-Ponty.

Phil **418 Philosophy of Biology** (3 cr). Classical and current conceptual and value questions in foundations and aims of biology.

Phil **WS420 Existentialism** (3 cr). WSU Phil 420. Alt/yrs.

Phil **421 Existentialism** (3 cr). Readings in such writings as Kierkegaard, Nietzsche, Camus, and Sartre.

Phil **422 Philosophical Ideas in Recent Literature** (3 cr). Ethical, social, and political trends; Nietzsche, Stein, Sartre, Maugham, Joyce, Hardy.

Phil **425 American Philosophy** (3 cr). Philosophical ideas of the U.S.; emphasis on period since 1875.

Phil **ID&WS431 Theory of Knowledge** (3 cr). WSU Phil 335. Analysis of the nature of knowledge; survey of various philosophical positions on the sources and extent of what we know.

Phil **ID&WS442 Philosophy of Mind** (3 cr). WSU Phil 450. Survey of current philosophical theories of nature of minds and mental states, including forms of dualism, reductive physicalism, functionalism, and eliminative materialism.

Phil **443 Philosophy of Language** (3 cr). Philosophical thinking about meaning, reference, and truth.

Phil **499** (s) **Directed Study** (cr arr). Prereq: perm.

Curricular Requirements

PHILOSOPHY (B.A. or B.S.)

Note: Students who intend to do graduate work are advised to take the Bachelor of Arts degree.

The electives in philosophy and related fields are to be selected with the approval of the chair of philosophy.

Required course work includes the university requirements (see regulation J-3), the general requirements for either the B.A. or B.S. degree, and:

Course	Credits
Phil 101 Ethics	3
Phil 211 Logic	3
Phil 309 History of Ancient Philosophy	3
Phil 310 History of Modern Philosophy	3
Philosophy electives (upper-division)	15
Related fields (humanities, social sc, and sc)	20

Academic Minor Requirements

PHILOSOPHY MINOR

Course	Credits
Phil 101 Ethics or 211 Logic	3
Phil 309 History of Ancient Philosophy	3
Phil 310 History of Modern Philosophy	3
Three upper-division philosophy courses	9

PHYSICAL EDUCATION—see Division of Health, Physical Education, Recreation and Dance

Department of Physics

Henry Willmes, Dept. Chair (13 Malcolm M. Renfrew Hall). Faculty: R. Paul Bickerstaff, Michael E. Browne, Philip A. Deutchman, Robert J. Kearney, James F. Kelly, Ruprecht Machleidt, George Patsakos, Bernhard J. Stumpf, Henry Willmes, Wei Jiang Yeh.

Physics is the scientific study of the nature and behavior of matter and energy. On the basis of quantitative observations, physicists develop theories to describe the observed behavior. Further experiments and observations are used to verify or refine the theories. The scientific method demands logical and mathematical rigor. The wealth of applications of physics to technology appeals to pragmatic persons, yet physics has much greater similarity to the arts and humanities than is commonly realized, because of the intellectual curiosity and creativity on which it is built.

The physics program at UI introduces students in technical and nontechnical curricula alike to the scientific method and to physical laws. Majors in physics can choose between traditional B.A. and B.S. curricula and the B.Appl.Phys. curriculum. The former emphasize a broad liberal-arts education and the core subjects in physics. Many B.A. and B.S. recipients go on to graduate study in physics or related disciplines. The B.Appl.Phys. curriculum includes a larger number of specialized courses, and more experience in electronics, computing, and research. It is intended primarily as preparation for a career in a physics-related applied discipline.

Training in the theory, history, and philosophy of physics is provided by the required core courses and electives in most of the major areas of specialization. Formal laboratory courses and directed research familiarize students with experimental techniques, modern instrumentation, and computers. Facilities include a number of lasers, spectrometers, optical telescopes, nuclear radiation detectors, and microprocessors. The program is supported by a

machine shop and an electronics shop. Collaborations with other universities and research institutes provide access to an even wider range of facilities.

The department offers graduate curricula leading to the M.S., M.A.T., and Ph.D. degrees. These programs are described in detail in the Graduate Bulletin. A bachelor's degree in physics is normally required as preparation for graduate study. Students with a bachelor's degree in another physical science, engineering, or mathematics will generally qualify after removal of a few upper-division-level deficiencies. A major in secondary education with specialization in physical science and mathematics is suitable preparation for the M.A.T. curriculum.

Faculty members in the department will be happy to discuss programs in detail with interested persons. Requests for information or a tour of the facilities can be made by a letter or telephone call (208/885-6380) to the department.

Physics Courses

CREDIT LIMITATIONS: Phys 113 carries no credit after 210; 114 carries no credit after 211; 115 carries no credit after 212; 116 carries no credit after 213.

Phys **101 Fundamentals of Physics** (4 cr). For students in nontechnical fields. Satisfies core requirement J-3-b. Conceptual study of laws of nature and their application, including mechanics, heat, electricity and magnetism, light, and modern physics. Three lec and one 2-hr lab a wk.

Phys **103 General Astronomy** (3 cr). Nonmathematical descriptive and physical astronomy; development of astronomical thought; properties and evolution of the solar system, stars, galaxies, and the universe.

Phys **104 Astronomy Lab** (1 cr). Naked eye, telescopic, and photographic observations of constellations, stars, and planets. One 2-hr lab a wk; some evening meetings. Prereq or coreq: Phys 103.

Phys **105 Physics and Society** (3 cr). Nonmathematical investigation of the interaction of science and society; emphasis on current topics, including radioactivity, pollution, transportation, communication, weapons, power generation, and ecology; exploration of the ethical, technological, and economic impact of science. Recommended companion course: Phys 106.

Phys **106 Physics and Society Lab** (1 cr). Lab to accompany Phys 105. One 2-hr lab a wk.

Phys **107 Physics of Music and Sound** (3 cr). Physical principles in production of musical tones of various sound systems; physical bases of musical instrumentation, synthesizers, microphone, amplifiers, recording systems, AM-FM modulation, stereophonic and quadraphonic systems. No background reqd beyond high school math.

Phys **108 Physics of Music and Sound Lab** (1 cr). Lab to accompany Phys 107. One 3-hr lab a wk. Coreq: Phys 107.

Phys **113-114 General Physics** (3 cr) (C, 113 only). Phys 113 satisfies core requirement J-3-b. Phys 113: mechanics, sound, and heat. Phys 114: electricity, magnetism, light, and modern physics. Three lec and one recitation a wk. Prereq: Math 140; Phys 113 for 114.

Phys **115-116 General Physics Lab** (1 cr). Phys 115 satisfies core requirement J-3-b. Lab to accompany Phys 113-114. One 2-hr lab a wk.

Phys **210 Engineering Physics** I (3 cr). Satisfies core requirement J-3-b. Kinematics and dynamics, work and energy, Newton's laws, oscillations, sound, geometric optics, physical optics, optical instruments. Three lec and one recitation a wk. Prereq or coreq: Math 180.

Phys **211 Engineering Physics II** (3 cr). Electricity, magnetism, electromagnetic waves, intro to atoms and nuclei. Three lec and one recitation a wk. Prereq: Phys 210; coreq: Math 190.

Phys **212-213 Engineering Physics Lab** (1 cr). Phys 212 satisfies core requirement J-3-b. Lab to accompany Phys 210-211. One 2-hr lab a wk.

Phys **222 Engineering Physics III** (3 cr). Waves in elastic media, sound waves, temperature, heat and thermodynamics, kinetic theory, Newton's laws as applied to rotation dynamics, gravity and central forces, conservation laws of energy, linear and angular momentum, collisions. Three lec and one recitation a wk. Prereq: Phys 210, 211 or perm; prereq or coreq: Math 190.

Phys **225 Introductory Physics Lab** (1 cr). Lab to accompany Phys 222. One 2-hr lab a wk.

Phys **301-302 Junior Physics Lab** (1-2 cr). Experimental techniques in modern physics, including optics, atomic and nuclear physics, and astronomy; computer uses, error analysis, literature searches. One 2-hr lab a wk per cr. Prereq: Phys 213 or perm.

Phys **307 Sound Waves and Acoustics** (3 cr). Sources of sound, propagation of sound waves through elastic media, and arch acoustics. Prereq: Phys 114 or 211 or 222, Math 200, or perm.

Phys **R309 Fundamentals of Radiation Biophysics** (3 cr). Nuclear physics, interaction of radiation with matter, detection of radiation, radiation dose limits, theory of ionization, dosimetry, dosimetry techniques, biological and medical effects of radiation, radiation shielding, radiation protection standards, counting statistics, and related topics. Prereq: perm.

Phys **R311 Health Physics in Industry Safety** (3 cr). Basic concepts of physics, biology, and radiation control as related to personnel protection from ionizing radiation.

Phys **315 Biophysics** (3 cr). Intro to the physics of biological processes and photobiology; interaction of radiation with biological systems; intramolecular and intermolecular forces and their relation to biological structure; methods of investigating living matter, including x-ray diffraction, fluorescence and magnetic resonance. Prereq: Phys 113-114 or equiv; Biol 201 recommended.

Phys **321-322 Analytical Mechanics** (3 cr). Statistics; kinematics and dynamics of a particle; systems of particles; rigid continuous media; intro to Lagrange's equations. Prereq: Phys 114 or 211 or 222, and Math 200.

Phys **330 Energy Sources** (3 cr). Physics of existing and ultimate sources of energy; emphasis on solar and wind energy. Prereq: Phys 113-114, or 210-211, and Math 180.

Phys **341-342 Electricity and Magnetism** (3 cr). Theory using vector calculus; electrostatics; magnetostatics, electromagnetism, analysis of AC and DC circuits; Maxwell's equations; radiation and propagation of electromagnetic waves. Prereq: Phys 114 or 211 or 222, and Math 200.

Phys **351 Elementary Quantum Mechanics** (3 cr). Methods; one-dimensional harmonic oscillator, free particle, rectangular potential barrier, hydrogen atom, and perturbation theory. Prereq: Phys 360; coreq: Phys 321.

Phys **360 Introduction to Modern Physics** (3 cr). Fundamentals of qualitative and quantitative description of atomic and nuclear physics, quantum theory, radioactivity, relativity, fusion and fission, spectra, x-rays, neutron physics, elementary particles, and solid state. Prereq: Phys 114 or coreq: Phys 211 or 222.

Phys **400** (s) **Seminar** (cr arr). Prereq: perm.

Phys **401-402 Seniors Physics Lab** (1-2 cr). Advanced experimental techniques in modern physics, including optics, atomic and nuclear physics, and astronomy; computer uses, error analysis, literature searches. One 2-hr lab a wk per cr. Prereq: Phys 301 or perm.

Phys **403** (s) **Workshop** (cr arr). Prereq: perm.

Phys **404** (s) **Special Topics** (cr arr).

Phys **411-412 Physical Instrumentation I-II** (3 cr). Methods and instruments used in experimental physics; electronic techniques; design problems in electronic measurement of physical quantities encountered in research. Two lec and one 3-hr lab a wk. Prereq: Phys 211 or 222 and Math 200 for Phys 411; Phys 411 for 412.

Phys **431-432 Thermodynamics and Kinetic Theory** (3 cr). Laws of thermodynamics, kinetic theory, and their application to topics in physics. Coreq: Phys 360.

Phys **443 Optics** (3 cr). Geometrical optics and photometry, interference, diffraction, double refraction, and polarization; application to modern optical instruments. Prereq: Phys 211 or 222, Math 190, and sr standing or perm.

Phys **444 Quantum Optics** (3 cr). Theory and application of lasers, optical spectrum analyzers, electro-optic modulators, and detectors; modern optical concepts and techniques; Gaussian beams and optical resonators, interaction of radiation and quantized matter, nonlinear optical effects, and laser spectroscopy. Prereq: Phys 211 or 222, Math 190, and sr standing or perm.

Phys **463 Introduction to Solid State** (3 cr). Physics of bulk matter; structure and types of solids, elastic and thermal properties of solids, electric and magnetic properties of solids, theory of conduction in metals and semiconductors. Prereq: Phys 321, 360.

Phys **465 Nuclear and Particle Physics** (3 cr). Structure of elementary particles, quark models; nuclear liquid drop, Fermi gas, shell and collective models; symmetries and cons laws; E and M, weak and strong interactions; accelerators and detectors. Prereq: Phys 360.

Phys **R471 Introduction to Theoretical Physics** (3 cr). Vector and tensor methods in conjunction with Newtonian and Lagrangian methods in solving problems in mechanical systems. Prereq: general physics, differential equations, and perm.

Phys **485 Astrophysics** (3 cr). Structure and evolution of stars and star systems; celestial mechanics; special and general relativity; cosmology. Prereq: Phys 103, 360, Math 200, or perm.

Phys **491 Proseminar** (1 cr). Recent dev. Prereq: sr standing in physics.

Phys **497 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

Phys **498 Research** (1-6 cr, max 6). Undergrad thesis. Prereq: jr standing in physics and perm of dept.

Phys **499** (s) **Directed Study** (cr arr). Prereq: perm.

Phys **500 Master's Research and Thesis** (cr arr).

Phys **501** (s) **Seminar** (cr arr). Graded P/F. Prereq: perm.

Phys **502** (s) **Directed Study** (cr arr). Prereq: perm.

Phys **503** (s) **Workshop** (cr arr). Prereq: perm.

Phys **504** (s) **Special Topics** (cr arr).

Phys **507-508 Modern Techniques of Science Instruction in Physics** (2 cr). Emphasis on extent and nature of subject-matter material for secondary schools and colleges.

Phys **511-512 Techniques of Experimental Physics** (3 cr). Development of experimental techniques and skills in active research fields; foundation for any field of physics. Nine hrs of lab a wk.

Phys **R518 Radiation Biology** (3 cr). Mechanisms and patterns of energy deposition by ionizing radiation in biological systems.

Phys **R519 Radiation Physiology** (3 cr). Selected topics from human physiology and methods of internal dosimetry. Prereq: radiation biol and calculus.

Phys **521 Advanced Mechanics** (3 cr). Classical mechanics; Lagrange's and Hamilton's principles, two-body problem, rigid body motion, special relativity, canonical transformation, Hamilton-Jacobi theory, small oscillations, and Lagrangian and Hamiltonian formulations for continuous systems and fields. Prereq: Phys 322.

Phys **531 Statistical Mechanics** (3 cr). Classical statistical mechanics of Maxwell, Boltzmann, and Gibbs; Maxwell-Boltzmann distribution law; Boltzmann's H-theorem, quantum statistical mechanics; Bose-Einstein and Fermi-Dirac statistics; application to problems in thermodynamics. Prereq: Phys 431, 551, or perm.

Phys **541-542 Electromagnetic Theory** (3 cr). Includes Maxwell's equations, electrostatics, magnetostatics, currents and their interactions, general theory of emission, propagation and absorption of electromagnetic waves, boundary value problems, relativistic formulation of electrodynamics. Prereq: Phys 322, 342.

Phys **551-552; 553 Quantum Mechanics** (3 cr). Phys 551-552: physical basis; Schroedinger wave formulation, Heisenberg matrix formulation, transformation theory, approximation methods, radiation theory, theory of scattering; application to atomic systems. Phys 553: relativistic quantum mechanics, second quantization field theory and application. Prereq: Phys 322, 360 for 551-552; 552 for 553.

Phys **561 Atomic Spectra and Atomic Structure** (3 cr). Experimental methods for the production and investigation of spectra, interpretation of special series, stationary states, spinning electrons and fine-line structure, and vector models; Zeeman and Stark effects; intensity of spectral lines. Prereq: Phys 351 or 551.

Phys **562 Molecular Spectra** (3 cr). Molecular spectra and their relations to molecular structure; emphasis on diatomic and triatomic molecules. Prereq: Phys 561 or perm.

Phys **563-564 Solid State Physics** (3 cr). Modern theory of metals, semiconductors, and insulators; crystal structure, thermal, electric, and magnetic properties of solids, band theory of solids, crystal imperfections, semiconductors, superconductivity, and photoconductivity. Prereq: Phys 342; prereq or coreq: Phys 551.

Phys **566 Nuclear Physics** (3 cr). Nuclei and nuclear interactions from a theoretical and experimental viewpoint, properties of nuclei, two-body problems, complex nuclei, nuclear spectroscopy, nuclear reactions, interaction of nuclei with radiation, nuclear models, theory of nuclear forces; topics in high energy physics; nucleus-nucleus collisions. Prereq: Phys 465, and 351 or 551.

Phys **571-572 Theoretical Physics** (3 cr). Methods and problems. Prereq: Phys 322 or perm.

Phys **573 Physical Applications of Group Theory** (3 cr). Intro to group theory with application to atoms, molecules, solids, and elementary particles; no previous knowledge of group theory assumed. Prereq: Phys 551 or equiv.

Phys **ID&WS581** (s) **Topics in Advanced Physics** (1-9 cr, max 9). WSU Phys 581. Topics of interest to students and staff.

Phys **R585-R586 Fundamental Reactor Kinetics** (3 cr). Complex plane transformations, transfer functions for various systems, derivation of reactor kinetics equations; analysis of nuclear feedback systems; statistical control theory applied to nuclear systems. Prereq: perm.

Phys **R587 Reactor Physics for Engineers** (3 cr). Review of nuclear physics, nuclear fission, chain reaction, and reactor theory. Prereq: Math 310 or equiv.

Phys **R588 Experimental Nuclear Physics** (3 cr). Experimental methods of interpretation of experimental measurements to determine the static and dynamic properties of nuclei. Prereq: Phys 360 and perm.

Phys **600 Doctoral Research and Dissertation** (cr arr).

Curricular Requirements

PHYSICS (B.A. or B.S.)

Required course work includes the university requirements (see regulation J-3), the general requirements for either the B.A. or B.S. degree, and:

Course	Credits
Phys 210, 211, 222 Engineering Physics I, II, III	9
Phys 212, 213 Engineering Physics Lab	2
Phys 225 Introductory Physics Lab	1
Phys 321-322 Analytical Mechanics	6
Phys 341-342 Electricity & Magnetism	6
Phys 351 Elementary Quantum Mechanics	3
Phys 360 Introduction to Modern Physics	3
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chem & Qual Analysis or 114 General Chem	4-5
Math 180, 190, 200 Analytic Geometry & Calculus	11
Mathematics (upper-division)	6
And, for the B.A. only:	
Upper-division physics courses (incl at least 4 cr of lab)	9
And, for the B.S. only:	
Upper-division physics courses (incl at least 4 cr of lab)	15

PHYSICS (B.Appl.Phys.)

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
Phys 210, 211, 222 Engineering Physics I, II, III	9
Phys 212, 213 Engineering Physics Lab	2
Phys 225 Introductory Physics Lab	1
Phys 321 Analytical Mechanics	3
Phys 341-342 Electricity & Magnetism	6
Phys 351 Elementary Quantum Mechanics	3
Phys 360 Introduction to Modern Physics	3
Phys 411-412 Physical Instrumentation I-II	6
Phys 443 Optics	3
Phys 444 Quantum Optics	3
Phys 498 Research	6
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chem & Qual Analysis or 114 General Chem	4-5
CS 105 FORTRAN Programming for Engr or 112 Introduction to Problem Solving & Programming	2-3
Math 180, 190, 200 Analytic Geometry & Calculus	11
Math 310 Ordinary Differential Equations	3
Physics, applied math, or computer science courses (upper-division), incl at least 3 cr of lab	9
Applied science or engineering courses	6

Recommended courses:
Phys 463 Introduction to Solid State
Eng 317 Technical & Engineering Report Writing

Note: Required theses (Phys 498) will generally be in the subject area of applied optics and optoelectronics. The decision as to the suitability of a proposed thesis topic must be made by the department's Applied Physics Committee no later than 1-1/2 semesters before graduation. Because of this requirement, students who wish to finish the requirements for this degree within four years are advised to begin discussion concerning possible topics with appropriate professors during the second semester of their junior year.

Academic Minor Requirements

PHYSICS MINOR

Course	Credits
Phys 210, 211, 212-213 Engineering Physics & Lab	8
ES 210 Engineering Statics	3
Physics courses numbered 300 or above (usual prerequisites are Math 180, 190, and 200)	12

Physiology

Faculty: Danny L. Barney, Richard C. Bull, James E. Butler, Joseph G. Cloud, Donald L. Crawford, Henry Daniell, Mark DeSantis, Dennis G. Dolny, Robert B. Dwelle, Victor P. Eroschenko, John K. Fellman, Carl W. Hunt, Rolf L. Ingermann, Gale E. Kleinkopf, Marc J. Klowden, Michael B. Laskowski, Duane J. LeTourneau, Robert L. Mahler, Thomas B. McFadden, Thomas A. McKean, Rodney A. Mead, Glen A. Murray, Lorin W. Roberts, Richard A. Roeder, Arthur W. Rourke, R. Garth Sasser, Gerald T. Schelling, Elizabeth South, Jeffrey C. Stark, Donald C. Thill, Anthony Trent, Robert R. Tripepi, Dale O. Wilson, Gordon L. Woods.

Teaching and research programs in physiology are available in several colleges and departments of the university. Master's and doctoral programs with concentration in animal or plant physiology are available through the Departments of Animal Science, Biological Sciences, and Plant, Soil, and Entomological Sciences.

The following courses are available for those students interested in animal and plant physiology and related areas. Full course descriptions are found under the designated departmental/program sections.

ANIMAL PHYSIOLOGY

AnSc **WS413 Physiology of Lactation** (3 cr).

AnSc **J451/J551 Endocrine Physiology** (3 cr).

AnSc **452 Physiology of Reproduction** (4 cr).

AnSc **454 Artificial Insemination and Pregnancy Detection** (2 cr).

AnSc **513 Microbiology and Physiology of Ruminant Nutrition** (3 cr).

AnSc **514 Physiology of Nonruminant Nutrition** (3 cr).

AnSc **ID&WS520 Seminar in Animal Physiology** (1 cr, max arr).

AnSc **WS526 Advanced Reproduction** (4 cr).

AnSc **552 Advanced Endocrine Physiology** (3 cr).

AnSc **ID&WS560 Domestic Animal Growth and Development** (3 cr).

Bact **J403/J503 Advanced Microbial Physiology** (2-4 cr).

Bact **460 Microbial Physiology** (5 cr).

Ent **J484/J584 Insect Anatomy and Physiology** (4 cr).

MedSc **ID&WS512 Basic Mechanisms in Cellular Physiology** (4 cr).

MedSc **ID&WS532 Nervous System** (5 cr).

PE **418 Physiology of Exercise** (3 cr).

PE **J493/J593 Fitness Assessment and Prescription** (3 cr).

PE **518 Advanced Physiology of Exercise** (3 cr).

Psych **372 Physiological Psychology** (3 cr).

VS **371 Anatomy and Physiology** (4 cr).

VS **WS517 Mammalian Neuroscience** (3 cr).

VS **WS518 Veterinary Physiology** (5 cr).

VS **WS520 Techniques in Mammalian Physiology** (2 cr).

VS **WS529 Neurochemistry** (3 cr).

Zool **119 Human Anatomy and Physiology** (5 cr).

Zool **324 Comparative Vertebrate Anatomy** (4 cr).

Zool **ID-J411/ID-J511 Comparative Vertebrate Reproduction** (3 cr).

Zool **412 Comparative Vertebrate Reproduction Lab** (2 cr).

Zool **J414/J514 Cell Physiology** (3 cr).

Zool **J415 Cell Physiology Lab** (2 cr).

Zool **J417/J517 Endocrine Physiology** (3 cr).

Zool **J423/J523 Comparative Vertebrate Physiology** (4 cr).

Zool **427 Vertebrate Histology and Organology** (4 cr).

Zool **J472/J572 Developmental Biology** (3 cr).

Zool **473 Comparative Embryology Lab** (1 cr).

Zool **WS505 Generation, Degeneration, and Regeneration in Nervous System** (2 cr).

PLANT PHYSIOLOGY

Biochem **486 Plant Biochemistry** (3 cr).

Bot **311 Plant Physiology** (3 cr).

Bot **312 Plant Physiology Lab** (2 cr).

Bot **J401/J510 Techniques of Plant-Tissue Culture** (2 cr).

Bot **J413/J515 Mineral Nutrition** (3 cr).

Bot **512 Plant Growth Substances** (3 cr).

PlSc **401 Crop Physiology** (3 cr).

PlSc **ID-J410/ID-J510 Biology of Weeds** (3 cr).

PlSc **461 Tree Fruit Production Techniques** (3 cr).

PlSc **ID475 Postharvest Pathology** (3 cr).

PlSc **WS535 Physiology and Genetics of Parasitism** (3 cr).

PlSc **ID&WS539 Herbicide Fate and Mode of Action** (4 cr).

PlSc **ID569 Seed Physiology and Seedling Establishment** (2 cr).

Soils **446 Soil Fertility** (3 cr).

Soils **WS541 Soil-Plant Relationships in Mineral Nutrition** (3 cr).

PLANT PATHOLOGY—see Department of Plant, Soil, and Entomological Sciences

Department of Plant, Soil, and Entomological Sciences

Lawrence E. O'Keeffe, Dept. Head (242 Iddings Wing, Ag. Sc. Bldg.).

Entomology Division: Joseph P. McCaffrey, Interim Division Chair; Craig R. Baird, Edward J. Bechinski, Merlyn A. Brusven, Gene P. Carpenter, Malcolm M. Furniss, Hugh W. Homan, James B. Johnson, Leslie P. Kish, Marc J. Klowden, Joseph P. McCaffrey, Thomas M. Mowry, Lawrence E. O'Keeffe, Larry E. Sandvol, Robert L. Stoltz.

Plant Pathology Division: Maurice V. Wiese, Division Chair; Philip H. Berger, James R. Davis, Robert L. Forster, John J. Gallian, Saad L. Hafez, Guy R. Knudsen, S. Krishna Mohan, Maurice V. Wiese.

Plant Science Division: Robert B. Dwelle, Division Chair; Dick L. Auld, Danny L. Barney, Robert H. Callihan, W. Michael Colt, Robert B. Dwelle, Charlotte Eberlein, Esmaeil Fallahi, John K. Fellman, Harold R. Guenthner, Stephen O. Guy, Gale E. Kleinkopf, Gary A. Lee, C. T. Liu, Stephen L. Love, Don W. Morishita, Glen A. Murray, James R. Myers, John C. Ojala, Larry D. Robertson, R. Robert Romanko, Edward J. Souza, Jeffrey C. Stark, Donald C. Thill, Michael K. Thornton, Anthony Trent, Robert R. Tripepi, Dale O. Wilson, Jr., Robert S. Zemetra.

Soil Science Division: Denny V. Naylor, Interim Division Chair; Bradford D. Brown, John E. Hammel, Robert L. Mahler, Paul A. McDaniel, Matthew J. Morra, Denny V. Naylor, Terry A. Tindall.

The challenge for today is to provide the world with food and fiber while protecting the environment. In addition to careers in production, processing, marketing, and international trade, we train scientists in biotechnology, biological control of insects, weeds and diseases, and preservation of soil, water, and air quality. Career opportunities are challenging, exciting, and unlimited.

The Department of Plant, Soil, and Entomological Sciences, within the College of Agriculture, offers B.S. degrees in entomology, plant protection, plant science, and soil science.

The entomology major emphasizes both basic and applied aspects of the study of insects and how they influence human activities. The program provides a broad entomological education with opportunities to specialize in such areas as agricultural and aquatic entomology, biological control, insect ecology, pathology and physiology, and insect-plant relations. The curriculum is designed for students pursuing professional careers in the basic and applied fields of entomology, or for those interested in continuing their education at the graduate level.

The plant protection curriculum offers students an education in the broad area of plant pest protection and in the related field of entomology. Students take a diverse array of applied natural-science courses including plant diseases, entomology, weeds, crop production, and botanical sciences.

Under the plant science degree, students can major in crop management, crop science, horticultural science, or landscape horticulture. The crop management major is for students who are interested in field crop management. The curriculum includes courses in basic sciences with emphasis on the production and management of crops that are economically significant to Idaho and the nation. Courses in plant science, soils, agricultural mechanization, and agricultural economics provide the general knowledge necessary for positions in the chemical, fertilizer, and seed industries or as farm managers, farm operators, and cooperative extension agents, and can lead to advanced degree studies.

The crop science and horticultural science majors are designed for students who are interested in professional careers in the sciences of plant physiology, pathology, breeding, weed control, and crop production. These majors are recommended for students interested in further study in plant sciences at the graduate level or interested in laboratory work. Students interested in professional careers in postharvest physiology and related industries can tailor their horticultural science curriculum to meet individual needs and interests.

The landscape horticulture major is designed for students interested in professional careers in the management and operation of commercial nurseries, greenhouses, landscapes, recreational parks, and related industries. Students interested in fruit and vegetable production are also included in this major.

The soil science degree program is offered for students who are interested in careers in the businesses and industries associated with soils and farm chemicals or are interested in a career as a professional soil scientist working with the formation, classification, chemistry, physics, and fertility of the valuable soil resources. Courses in geology, botany, chemistry, and physics, in addition to soils, are stressed to prepare students for professional careers.

The degree offerings are designed to prepare students for a variety of rewarding career opportunities. Each of these degree programs

is based on a curriculum designed to provide students with fundamental training necessary for present and future employment. The department offers students the opportunity to work closely with faculty in classroom and field situations. The faculty members provide considerable breadth in educational experiences for students who major in this department. Formal courses are offered as needed to serve the students in the various degree programs, and additional specialization may be obtained by enrolling in directed study, special topics, seminar, and other courses of similar nature, with faculty members who have expertise in a particular area. Students are also encouraged to participate in the Student Internship Program. Internships provide students with practical job experience and they often open doors for career opportunities.

Faculty members are concerned with the needs and interests of individual students. Questions regarding specific programs or arrangements to tour facilities are most welcome. Prospective majors in entomology, plant protection, plant science, or soil science can consult the department head in Room 242, Agricultural Science Building, or telephone 208/885-6276.

Courses

ENTOMOLOGY

Ent **211 General Entomology** (4 cr). Satisfies core requirement J-3-b. Structure, development, classification, habits, and ecology of insects. Three lec and one 3-hr lab a wk.

Ent **217 Introduction to Integrated Pest Management** (2 cr). Principles, theory, and methodology of regulating populations of organisms detrimental to agriculture.

Ent **322 Economic Entomology** (3 cr). Identification, biology, and importance of insects and related arthropods to humans and agriculture; basic principles of arthropod pest management. Two lec and one 3-hr lab a wk. Prereq: Ent 211 or perm.

Ent **389 Internship** (1-6 cr, max 6). Graded P/F. Prereq: perm of dept.

Ent **400** (s) **Seminar** (cr arr). Prereq: perm.

Ent **404** (s) **Special Topics** (cr arr). Prereq: perm.

Ent **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Ent **438 Pesticides in the Environment** (3 cr). Same as Inter, PISc, and Soils 438. Principles of pesticide fate in soil, water, and air; pesticide metabolism in plants, pesticide toxicology, and pesticide mode-mechanism of action; pest resistance to pesticides; biotechnology in pest control; regulations and liability; equipment application technology; pesticide transport, storage, and disposal; and social and ethical considerations. Prereq: Chem 275.

Ent **J440/J540 Insect Identification** (4 cr). Survey of approximately 200 major families; collecting and preservation techniques. For grad cr, an additional 50 families and selected subfamilies and genera will be covered and a term paper is reqd. Two lec and two 2-hr labs a wk; two 1-day field trips. Prereq: Ent 211 or perm.

Ent **J442/J532 Immature Insects** (3 cr). Alt/yrs. Structure, behavior, and identification of immature insects. For grad cr, taxonomy of selected families at generic and species levels will be studied. One lec and two 2-hr labs a wk; one 1-day field trip. Prereq: Ent 211.

Ent **WS443 Insect Ecology** (3 cr). WSU Entom 443. Alt/yrs.

Ent **WS444 Insect Morphology** (4 cr). WSU Entom 444. Alt/yrs.

Ent **ID-J446/ID-J546 Plant Resistance to Arthropods** (2 cr). WSU Entom 446/546. Alt/yrs. Use of plant resistance; environmental manipulation, and cultural practices for suppression of important insect pests; mechanisms of plant resistance and insect-plant associations. Requirements for grad cr include comprehensive term paper and class presentation on plant-insect relationships or related topic. Prereq: Ent 217, or perm.

Ent **447/ID-J547 Biological Control of Arthropod Pests and Weeds** (4 cr). WSU Entom 547. Alt/yrs. Intro to hist and dev of biol control and biol and ecological factors involved; emphasis on entomophagous and phytophagous insects. For grad cr, a "grant proposal" for presentation and critique and a semester project reqd. Prereq: Ent 211 and general ecology or perm.

Ent **WS448 Medical Entomology** (4 cr). WSU Entom 448. Alt/yrs.

Ent **H450 Insect-Borne Diseases: Epidemiology and Implications** (2 cr). Socioeconomic impact of pathogens transmitted to humans and animals by insects; political and economic considerations for the control of insect-borne disease. Prereq: perm of director of University Honors Program.

Ent **ID472 Aquatic Entomology** (1 cr). WSU Entom 472. Identification and biology of insects associated with aquatic and subaquatic environments. Prereq: perm.

Ent **ID474 Aquatic Entomology Lab** (2 cr). WSU Entom 474. Lab to accompany Ent 472. Two 3-hr labs a wk; two 1-day field trips. Coreq: Ent 472.

Ent **J484/J584 Insect Anatomy and Physiology** (4 cr). Same as Zool 494. Alt/yrs. Organ systems of insects and their functions. A comprehensive term paper and research project reqd for grad cr. Three lec and one 3-hr lab a wk. Prereq: Ent 211.

Ent **J491/J591 Principles of Integrated Pest Management** (3 cr). Alt/yrs. Ecological, biological, economic, and sociological considerations involved in pest management decisions. For grad cr, written grant proposal related to research/extension and oral defense of proposal reqd. Prereq: sr standing.

Ent **499** (s) **Directed Study** (cr arr). Prereq: perm.

Ent **500 Master's Research and Thesis** (cr arr).

Ent **501** (s) **Seminar** (cr arr). Prereq: perm.

Ent **502** (s) **Directed Study** (cr arr). Prereq: perm.

Ent **504** (s) **Special Topics** (cr arr). Prereq: perm.

Ent **506** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Ent **532 Immature Insects** (3 cr). See Ent J442/J532.

Ent **540 Insect Identification** (4 cr). See Ent J440/J540.

Ent **ID541 Advanced Insect Ecology** (3 cr). WSU Entom 541. Alt/yrs. Population and community dynamics; theory and applications in natural and artificial systems. Two lec and one 3-hr lab a wk; two 1-day field trips. Prereq: Ent 211 and general ecology or perm.

Ent **WS542 Insect Behavior** (4 cr). WSU Entom 542. Alt/yrs.

Ent **WS543 Ecodynamics** (2 cr). WSU Entom 543. Alt/yrs.

Ent **544 Systematic Entomology** (3 cr). Alt/yrs. Principles and concepts of insect classification; taxonomic procedures, rules of zoological nomenclature, and intro to evolution, speciation, and biogeography.

Ent **WS545 Toxicology of Pesticides** (3 cr). WSU Entom 545. Alt/yrs.

Ent **546 Host Plant Resistance and Cultural Suppression of Insect Pests** (2 cr). See Ent J446/J546.

Ent **ID547 Biological Control of Arthropod Pests and Weeds** (4 cr). See Ent J447/J547.

Ent **WS548 Acarology** (3 cr). WSU Entom 544. Alt/yrs.

Ent **WS550 Insect Physiology** (4 cr). WSU Entom 550. Alt/yrs.

Ent **WS560 Photography for Entomologists** (2 cr). WSU Entom 560. Alt/yrs.

Ent **WS561 Quantitative Methods in Entomological Research** (4 cr). WSU Entom 561. Alt/yrs.

Ent **WS568 Systems Analysis in Integrated Pest Management** (3 cr). WSU Entom 562. Alt/yrs.

Ent **584 Insect Anatomy and Physiology** (4 cr). See Ent J484/J584.

Ent **591 Principles of Integrated Pest Management** (3 cr). See Ent J491/J591.

Ent **597** (s) **Practicum** (cr arr). Prereq: perm.

Ent **598** (s) **Internship** (cr arr). Prereq: perm.

Ent **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Ent **600 Doctoral Research and Dissertation** (cr arr).

PLANT SCIENCE

PISc **102 Introduction to Plant Science** (3 cr). Structure, propagation, growth, and culture of crop and ornamental plants. Two lec and one 2-hr lab a wk.

PISc **202 Plant Propagation** (3 cr). Alt/yrs. Sexual and asexual propagation techniques of herbaceous and woody ornamental plants; propagation methods covered including seed, cuttings, layering, grafting, and cloning/tissue culture. Two lec and one 3-hr lab a wk. Prereq: PISc 102 or Biol 201, or perm.

PISc **WS301 Turfgrass Culture** (3 cr). WSU Agron 301.

PISc **305 Introduction to Plant Pathology** (4 cr). Lab exercises and discussion on identification, symptoms, causes, effects, and control of plant diseases. Three 1-hr lec and one 2-hr lab a wk. Prereq: PISc 102 or Biol 203.

PISc **308 Forage Crops** (3 cr). Production, management, and use of forage plants for livestock feed as pasture, hay, silage, and greenchop, and for soil and water conservation. Two lec and one 2-hr lab a wk.

PISc **WS320 Commercial Vegetable Crops** (3 cr). WSU Hort 320.

PISc **WS321 Commercial Vegetable Crops Lab** (1 cr). WSU Hort 321.

PISc **338 Weed Control** (3 cr). Nature and scope of weed problems, identification and biology of weeds, principles, theory, and practice of mechanical, chemical, and biological control of weeds; legal considerations; integration of methods into functional management systems. Two lec and one 2-hr lab a wk. Prereq: jr standing or perm.

PISc **340 Nursery Management** (3 cr). Alt/yrs. Management of commercial nurseries from plant propagation through sale of the plants. Two lec and one 2-hr lab a wk; one 1-day field trip.

PISc **389 Internship** (1-6 cr, max 6). Graded P/F. Prereq: perm of dept.

PISc **399** (s) **Directed Study** (1-2 cr, max 2). Prereq: perm.

PISc **400** (s) **Seminar** (1 cr). Prereq: perm.

PISc **401 Crop Physiology** (3 cr). Alt/yrs. Application of physiology to crop management. Prereq: Bot 311.

PISc **404 Plant Disease Recognition and Control** (3 cr). Characteristics and control of representative plant diseases; symptomatology stressed via extensive visual aids. Two 2-hr meetings a wk. Prereq: PISc 305 or equiv.

PlSc **406** (s) **Special Topics** (cr arr).

PlSc **407 Field Crop Production** (3 cr). Management and use of crops in Idaho and the Northwest.

PlSc **ID-J410/ID-J510 Biology of Weeds** (3 cr). WSU Agron 413/513. Alt/yrs. Biology, ecology, and physiology of weeds with emphasis on crop and weed interactions. Requirements for grad cr incl comprehensive term paper and class presentation on weed-crop interaction. Two lec and one 3-hr lab a wk. Prereq: Bot 311 or perm.

PlSc **WS411 Seed Science and Technology** (3 cr). WSU Agron 410. Alt/yrs.

PlSc **WS-J420/WS-J570 Potato Physiology and Production Technology** (2 cr). WSU Hort 420/520. Alt/yrs.

PlSc **WS421 General Mycology** (4 cr). WSU Pl P 421. Alt/yrs.

PlSc **438 Pesticides in the Environment** (3 cr). See Ent 438.

PlSc **ID440 Economic Nematology** (3 cr). WSU Pl P 440. Alt/yrs. Techniques of isolation, identification, crop loss assessment, and control of plant parasitic nematodes. Five hrs lec/lab a wk. Prereq: PlSc 305.

PlSc **J446/J546 Plant Breeding** (3 cr). Alt/yrs. Application of genetic principles to improvement of crop plants. Grad students reqd to complete additional term paper. Prereq: Genet 314 or equiv.

PlSc **461 Tree Fruit Production Techniques** (3 cr). Alt/yrs. Relationships between physiological processes in fruit trees and management decisions necessary for successful commercial production. One 2-day field trip.

PlSc **462 Greenhouse Management** (3 cr). Alt/yrs. Greenhouse structures and heating; culture of greenhouse crops. Two lec and one 2-hr lab a wk; one 1-day field trip.

PlSc **463 Vegetable Crops** (3 cr). Alt/yrs. Principles of commercial and home garden vegetable production; culture, marketing, storage, and use. Prereq: PlSc 102 or equiv.

PlSc **464 Landscape Maintenance** (3 cr). Alt/yrs. Use and culture of landscape plants to enhance man's environment. Two lec and one 2-hr lab a wk; one 1-day field trip. Prereq: PlSc 102, LArch 288, Soils 205.

PlSc **ID&WS469 Seed Production** (2 cr). WSU Hort 469. Alt/yrs. Crops indigenous to the Northwest; seedhouse operations and seed regulation. Prereq: perm.

PlSc **ID475 Postharvest Pathology** (3 cr). WSU Pl P 475. Alt/yrs. Survey of pathological conditions responsible for postharvest losses of horticultural food crops; visual aids and fresh specimen material emphasized; environmental and chemical control methods studied for each class example. Prereq: PlSc 305.

PlSc **480 Field Trip** (1 cr). Five-day field trip to production areas. Prereq: perm.

PlSc **ID-J490/J590 Potato Science** (3 cr). WSU Hort 470. Alt/yrs. History, botanical characteristics, seed physiology and production, plant population, physiology of growth, and pest management; factors influencing maturation, harvest, yield, grade, bruise control, storage, and quality maintenance; economics of production and research on a global basis. Requirements for grad cr incl comprehensive term paper and class presentation on selected topic.

PlSc **500 Master's Research and Thesis** (cr arr).

PlSc **501** (s) **Seminar** (cr arr). Prereq: perm.

PlSc **502** (s) **Directed Study** (cr arr). Prereq: perm.

PlSc **504** (s) **Special Topics** (cr arr).

PlSc **WS505 Advanced Plant Breeding** (4 cr). WSU Agron 504. Alt/yrs.

PlSc **WS506 Diseases of Plants** (4 cr). WSU Pl P 501.

PlSc **WS508 Seed Physiology** (3 cr). WSU Agron 508. Alt/yrs.

PlSc **WS509 Physiology in Plant Breeding** (3 cr). WSU Agron 509. Alt/yrs.

PlSc **ID510 Biology of Weeds** (3 cr). See PlSc J410/J510.

PlSc **WS511 Viruses and Virus Diseases of Plants** (4 cr). WSU Pl P 511.

PlSc **WS512 Methods in Plant Virus Research** (2 cr). WSU Pl P 512. Alt/yrs.

PlSc **WS514 Phytobacteriology** (4 cr). WSU Pl P 514.

PlSc **WS515 Improvement of Crop Quality** (3 cr). WSU Agron 505. Alt/yrs.

PlSc **ID516 Advanced Plant Virology and Molecular Biology** (3 cr). WSU Pl P 516. Alt/yrs. Molecular biology of plant viruses incl replication and translation mechanisms; formal and informal discussions, literature review, and lab demonstrations and experiments involving selected plant viruses.

PlSc **517 Plant Disease Epidemiology** (3 cr). Alt/yrs. Theory and practical implications of disease processes, incidence, and severity in plant populations; lec, discussions, outside reading, and hands-on exercises. Prereq: PlSc 305, upper-division or grad standing.

PlSc **ID520 Plant Cytogenetic Techniques** (3 cr). WSU Agron 520. Alt/yrs. Techniques to study plant genes and chromosomes. Two lec and 4 hrs of lab a wk. Prereq: Genet 314 or equiv.

PlSc **WS527 Weed Science Experimental Methods** (2 cr). WSU Agron 527. Alt/yrs.

PlSc **WS535 Physiology and Genetics of Parasitism** (3 cr). WSU Pl P 535. Alt/yrs.

PlSc **ID&WS539 Herbicide Fate and Mode of Action** (4 cr). WSU Agron 539. Alt/yrs. Fate of herbicides in plants, soil, and water; physiological and biochemical mode of herbicide action; mechanisms of herbicide resistance. Prereq: PlSc 338, Bot 311, and Biochem 380 or perm.

PlSc **540 Seed Pathology** (3 cr). Alt/yrs. Seed-borne pathogens, including fungi, bacteria, and viruses; influence on disease spread.

PlSc **546 Plant Breeding** (3 cr). See PlSc J446/J546.

PlSc **WS550 Advanced Cell Biology** (3 cr). WSU GenCB 550. Alt/yrs.

PlSc **ID569 Seed Physiology and Seedling Establishment** (2 cr). WSU Agron 569. Alt/yrs. Environmental factors and physiological seed characteristics that influence seedling establishment; priming and other preconditioning treatments for enhanced establishment. Prereq: Bot 311 or equiv.

PlSc **WS570 Potato Physiology and Production Technology** (2 cr). See PlSc J420/J570.

PlSc **WS571 Plant Molecular Genetics** (3 cr). WSU GenCB 570. Alt/yrs.

PlSc **590 Potato Science** (3 cr). See PlSc J490/J590.

PlSc **WS592 Advanced Topics in Cell Biology** (1-3 cr, max 7). WSU GenCB 592.

PlSc **597** (s) **Practicum** (cr arr). Prereq: perm.

PlSc **598** (s) **Internship** (cr arr). Prereq: perm.

PlSc **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

PlSc **600 Doctoral Research and Dissertation** (cr arr).

SOILS

Soils **205 General Soils** (3 cr). Intro to chemical, physical, and biological nature of soils. Prereq: Chem 111 or equiv.

Soils **206 General Soils Lab** (1 cr). Lab study relevant to Soils 205. Experiments and demonstrations on basic and applied aspects of soil science. One 3-hr lab a wk. Coreq: Soils 205.

Soils **354 Soil Resources and Land Use Planning** (2 cr). Soil surveys, guides and methods in making soil interpretation; use of soils data and interpretation in land use and environmental decisions.

Soils **365 Soil Conservation and Management** (3 cr). Alt/yrs. Relationships of soil type, slope, climate, and erosion to land capability; conservation and management practices for erosion control. Two 1-day field trips. Prereq: Soils 205.

Soils **389 Internship** (1-6 cr, max 6). Graded P/F. Prereq: perm of dept.

Soils **401 Undergraduate Research** (1-2 cr, max 4). Individual study. Prereq: sr standing and perm.

Soils **404** (s) **Special Topics** (cr arr).

Soils **415 Soil Physics** (3 cr). Alt/yrs. Physical properties of soils and their relationships to moisture, aeration, and temperature; cultural practices and erosion problems. Two lec and one 3-hr lab a wk. Prereq: Soils 205, 206, and Phys 113.

Soils **417 Soil Clay Mineralogy** (2 cr). Alt/yrs. Structure, chemistry, and physical properties of clay minerals found in soils. Prereq: Chem 112 or 114.

Soils **422 Soil Chemistry** (3 cr). Alt/yrs. Chemical processes in soil environment. Prereq: Soils 205, 206, and Chem 112 or 114.

Soils **J423/J523 Soil-Plant Analysis** (2 cr). Alt/yrs. Quantitative inorganic chemical analysis of soil-water-plant system. Special project reqd for grad cr. One lec and one 3-hr lab a wk. Prereq: Soils 205, 206, and Chem 112 or perm.

Soils **425 Microbial Ecology** (4 cr). See Bact 425.

Soils **438 Pesticides in the Environment** (3 cr). See Ent 438.

Soils **446 Soil Fertility** (3 cr). Alt/yrs. Principles of soil fertility management; availability of plant nutrients and their relationship to plant growth and fertilization practices. Prereq: Soils 205, 206.

Soils **J447/ID-J547 Soil Fertility Management** (3 cr). WSU Soils 547. Alt/yrs. Philosophy of fertilizer recommendations based on soil and plant tissue testing; principles of fertilizer manufacture, placement, and use for improving plant growth. Project reqd for grad cr. Prereq: Soils 446.

Soils **454 Soil Development and Classification** (3 cr). Relationship of soil development to soil properties; soil profile descriptions and classification. Two lec and one 2-hr lab a wk; two 1-day or one 2-day field trips. Prereq: Soils 205, 206.

Soils **490 Proseminar** (1 cr, max 2). Prereq: jr standing or perm.

Soils **499** (s) **Directed Study** (cr arr). Prereq: perm.

Soils **500 Master's Research and Thesis** (cr arr).

Soils **501** (s) **Seminar** (cr arr). Prereq: perm.

Soils **502** (s) **Directed Study** (cr arr). Prereq: perm.

Soils **504** (s) **Special Topics** (cr arr).

Soils **WS513 Advanced Soil Physics** (2 cr). WSU Soils 513. Alt/yrs.

Soils **ID&WS522 Advanced Soil Chemistry** (3 cr). WSU Soils 521. Alt/yrs. Chemical properties of soil colloidal systems. Prereq: Soils 422, Chem 253, or perm.

Soils **523 Soil-Plant Analysis** (2 cr). See Soils J423/J523.

Soils **WS524 Soil Minerology** (3 cr). WSU Soils 524. Alt/yrs.

Soils **527 Soil Humus Chemistry** (2 cr). Alt/yrs. Formation, chemical properties, and significance of the soil organic fraction. Prereq: Soils 422, Bact 425, and course in organic chemistry, or perm.

Soils **WS531 Advanced Soil Biochemistry and Microbiology** (2 cr, max 4). WSU Soils 531.

Soils **ID537 Soil Biochemistry** (3 cr). WSU Soils 537. Alt/yrs. Same as Biochem 537. Origin, chemical structure, and significance of soil biochemical compounds. Prereq: Soils 422, Biochem 380, Bact 250 or perm.

Soils **WS541 Soil-Plant Relationships in Mineral Nutrition** (3 cr). WSU Soils 541. Alt/yrs.

Soils **ID547 Soil Fertility Management** (3 cr). See Soils J447/J547.

Soils **549 Tropical Soils** (3 cr). Same as For 549. Alt/yrs. Management of tropical soils in relation with nitrogen, acidity, liming, phosphorus, and other nutrients; effects of cropping/forestry systems on soil productivity; survey of types and potential uses of soils in the tropics. Prereq: Soils 205 or perm.

Soils **WS551 Advanced Soil Genesis** (3 cr). WSU Soils 551. Alt/yrs.

Soils **ID557 Advanced Soil Genesis and Classification** (3 cr). WSU Soils 557. Alt/yrs. Field study of interrelationship of soil properties, classification, and land-use interpretation. One lec and one 4-hr lab a wk; one 8-day or eight 1-day field trips. Prereq: Soils 454 or perm.

Soils **597** (s) **Practicum** (cr arr). Prereq: perm.

Soils **598** (s) **Internship** (cr arr). Graded P/F. Prereq: perm.

Soils **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Soils **600 Doctoral Research and Dissertation** (cr arr).

Curricular Requirements

ENTOMOLOGY (B.S.Ent.)

Designed for students who desire professional careers in the basic and applied fields of entomology (insect taxonomy, ecology, physiology, and agriculture, aquatic, and forest entomology).

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
Ent 211 General Entomology	4
Ent 322 Economic Entomology	3
Ent 440 Insect Identification	4
Ent 484 Insect Anatomy & Physiology	4
Bact 250 General Microbiology	4
Biol 201 Introduction to the Life Sciences	4
Biol 202 General Zoology	4
Biol 203 General Botany	4
Biol 331 General Ecology	3
Biol 332 Methods in Ecology & Field Biology	2
Biol 351 General Genetics	3
Biol 352 Experimental Genetics	2
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
Chem 277 Organic Chemistry I	3
CommG 131 Fundamentals of Public Speaking	2
Eng 313 Business Writing or 317 Tech & Engr Report Writing	3
PlSc 305 Introduction to Plant Pathology	4
Stat 251 Principles of Statistics	3
Entomology electives	5
Life sciences electives	11
Mathematics electives	4
Physics electives	3
Humanities and social sciences electives	14
Electives to total 132 cr for the degree	—

Courses strongly recommended:

Ent 217 Introduction to Integrated Pest Management	2
Ent 491 Principles of Integrated Pest Management	3
Biochem 380 Introductory Biochemistry	3
Bot 241 Systematic Botany	3
CS 100 Introduction to Computers & Programming	3
Math 180 Analytic Geometry & Calculus I	4
Zool 484 Invertebrate Zoology	4

Plant Sciences

The plant science area offers four programs designed to prepare students for a wide variety of professional careers in agriculture, which may include either crop production, processing, merchandising, research, or extension. The crop science major emphasizes a strong scientific background for careers involving agronomic food and forage crops. The horticultural science major provides a strong science background for careers involving horticultural food and ornamental crops. The crop management major is designed to prepare students for more applied careers with agronomic crops. The landscape horticulture major is designed for careers in management of commercial nurseries, greenhouses, landscapes, recreational parks, and related businesses. Students who wish to prepare for graduate study are encouraged to major in either crop science or horticultural science; however, the other degrees do not preclude graduate training.

CORE COURSES FOR B.S.PL.SC.

Course	Credits
PlSc 102 Introduction to Plant Science	3
PlSc 305 Introduction to Plant Pathology	4
PlSc 338 Weed Control	3
PlSc 400 Seminar	1
AgMech 315 Irrigation & Drainage	2
Biol 201 Introduction to the Life Sciences	4
Biol 203 General Botany	4
Bot 241 Systematic Botany	3
Chem 103 Intro to Chemistry or 111 Prin of Chemistry	4
Chem 275 Carbon Compounds	3
CommG 131 Fundamentals of Public Speaking	2
Eng 313 Business Writing or 317 Tech & Engr Report Writing	3
Genet 314 General Genetics	3
Math 111 Finite Math or Math 140 Pre-calculus Algebra & Analytic Geometry or Stat 251 Principles of Statistics	3-4
Soils 205, 206 General Soils & Lab	4
Humanities and social sciences electives	14

CROP MANAGEMENT (B.S.Pl.Sc.)

Required course work includes the university requirements (see regulation J-3), the plant science core, and:

Course	Credits
Acctg 201 Principles of Accounting	3
AgEc 278 Principles of Farm & Ranch Management	4
AgEc 289 Agricultural Markets & Prices	3
AgMech 112 Introduction to Agricultural Mechanization	3
AnSc 109 Science of Animals that Serve Mankind or 205 Introduction to Animal Nutrition	3
Econ 152 Principles of Economics	3
Ent 211 General Entomology or 322 Economic Entomology	3-4
Soils 446 Soil Fertility	3
Plant science approved electives	13-14
Electives to total 132 cr for the degree	—

CROP SCIENCE (B.S.Pl.Sc.)

Required course work includes the university requirements (see regulation J-3), the plant science core, and:

Course	Credits
Bact 250 General Microbiology	4
Bot 311 Plant Physiology	3
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
Chem 253 Quantitative Analysis	5
Chem 276 Carbon Compounds Lab	1
Ent 211 General Entomology or 322 Economic Entomology	3-4
Phys 113-114 General Physics	6
Soils 446 Soil Fertility	3
Ag economics or economics electives	3
Plant science approved electives	13-15
Electives to total 132 cr for the degree	—

HORTICULTURAL SCIENCE (B.S.Pl.Sc.)

Required course work includes the university requirements (see regulation J-3), the plant science core, and:

Course	Credits
Bact 250 General Microbiology	4
Biochem 380 Introductory Biochemistry	3
Bot 311 Plant Physiology	3
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
Chem 253 Quantitative Analysis	5
Chem 276 Carbon Compounds Lab	1
Ent 211 General Entomology or Ent 322 Economic Entomology	3-4
Phys 113-114 General Physics	6
Soils 446 Soil Fertility	3
Plant science approved electives	17-22
Electives to total 132 cr for the degree	—

LANDSCAPE HORTICULTURE (B.S.Pl.Sc.)

Required course work includes the university requirements (see regulation J-3), the plant science core, and:

Course	Credits
AgMech 112 Introduction to Agricultural Mechanization	3
AgMech 115 Graphical Representation	2
Art 111-112 Drawing I	4
Bot 311 Plant Physiology	3
Ent 211 Economic Entomology or Ent 322 Economic Entomology	3-4
LArch 288, 388 Plant Materials	7
Business and accounting electives	6
Plant science approved electives	11-13
Electives to total 132 cr for the degree	—

PLANT PROTECTION (B.S.Pl.Prot.)

Designed to prepare students for professional careers in the broad field of plant protection. This program integrates the fields of entomology, plant pathology, and weed science to provide students with a broad understanding of our agricultural, food, and environmental problems. Students so trained should have wide choices in selecting careers.

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
AgMech 112 Introduction to Agricultural Mechanization	3
Bact 250 General Microbiology	4
Biochem 380, 382 Introductory Biochemistry & Lab	4
Biol 201 Introduction to the Life Sciences	4
Biol 202 General Zoology	4
Biol 203 General Botany	4
Biol 331 General Ecology	3
Bot 241 Systematic Botany	3
Bot 311 Plant Physiology	3
Chem 103 Introduction to Chemistry	4
Chem 275, 276 Carbon Compounds & Lab	4
CommG 131 Fundamentals of Public Speaking	2
Eng 313 Business Writing or 317 Tech & Engr Report Writing	3
Ent 211 General Entomology	4
Ent 217 Introduction to Integrated Pest Management	2
Ent 322 Economic Entomology	3
Math 111 Finite Math or 140 Pre-calculus Algebra & Analytic Geom	3-4
PISc 305 Introduction to Plant Pathology	4
PISc 338 Weed Control	3
PISc 410 Biology of Weeds	3
PISc 440 Economic Nematology	3
PISc/Ent 438 Pesticides in the Environment	3
Soils 205 General Soils	3
Agricultural economics electives	3
Plant protection approved electives	13-14
Electives to total 136 cr for the degree	—

SOIL SCIENCE (B.S.Soil Sc.)

This degree prepares students for a variety of professional careers such as industry field representative, soil classifier, soil conservationist, for technical positions in public and private organizations, or for graduate studies. Completion of either option satisfies the minimum requirements for certification as a soil scientist, soil specialist, or soil classifier and the technology option satisfies requirements for certification as an agronomist by the American Registry of Certified Professionals in Agronomy, Crops, and Soils (ARCPACS).

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
Soils 205, 206 General Soils & Lab	4
Soils 415 Soil Physics	3
Soils 422 Soil Chemistry	3
Soils 446 Soil Fertility	3
Soils 454 Soil Development & Classification	3
Biol 201 Introduction to the Life Sciences	4
Biol 203 General Botany	4
Bot 311 Plant Physiology	3
Chem 111 Principles of Chemistry	4
Chem 112 Inorganic Chemistry & Qualitative Analysis	5
Chem 275 Carbon Compounds or 277 Organic Chemistry I	3
CommG 131 Fundamentals of Public Speaking	2
Eng 313 Business Writing or 317 Tech & Engr Report Writing	3
Geol 101 Physical Geology	3
Phys 113 General Physics	3
PISc 102 Introduction to Plant Science	3
PISc 407 Field Crop Production	3
Stat 251 Principles of Statistics	3
Computer science electives	2-3
Engineering electives	3
Economics or agricultural economics electives	3

And one of the following options:

A. SCIENCE OPTION

Course	Credits
Soils 423 Soil-Plant Analysis	2
Bact 250 General Microbiology	4
Chem 253 Quantitative Analysis	5
Geol 102 Physical Geology Lab	1
Phys 114 General Physics	3
One of the following	7-8
Math 111 Finite Math and 160 Survey of Calculus	
Math 180 Analytic Geometry & Calculus I and math elective	
Electives to total 128 cr for the degree	—

B. TECHNOLOGY OPTION

Course	Credits
Soils 447 Soil Fertility Management	3
Bot 241 Systematic Botany	3
Ent 211 General Entomology	4
Genet 314 General Genetics	3
PISc 305 Introduction to Plant Pathology	4
PISc 338 Weed Control	3
Economics or agricultural economics electives	3
Math electives	7
Electives to total 128 cr for the degree	—

Academic Minor Requirements

CROP SCIENCE MINOR

Course	Credits
Ent 211 General Entomology	4
PISc 102 Introduction to Plant Science	3
PISc 305 Introduction to Plant Pathology	4
PISc 407 Field Crop Production	3
Soils 205, 206 General Soils & Lab	4
Courses selected from the following	3
Ent 217 Introduction to Integrated Pest Management	
PISc 308 Forage Crops	
PISc 401 Crop Physiology	
PISc 446 Plant Breeding	
PISc 469 Seed Production	
PISc 490 Potato Science	

ENTOMOLOGY MINOR

Course	Credits
Ent 211 General Entomology	4
Ent 322 Economic Entomology	3
Ent 440 Insect Identification	4
Ent 484 Insect Anatomy & Physiology	4
Courses selected from the following	3
Ent 442 Immature Insects	
Ent 443 Insect Ecology	
Ent 444 Insect Morphology	
Ent 446 Plant Resistance to Arthropods	
Ent 447 Biological Control of Arthropod Pests & Weeds	
Ent 448 Medical Entomology	
Ent 472 Aquatic Entomology	
Ent 474 Aquatic Entomology Lab	
Ent 491 Principles of Integrated Pest Management	

HORTICULTURE MINOR

Course	Credits
PISc 102 Introduction to Plant Science	3
PISc 202 Plant Propagation	3
Three of the following courses	9
PISc 340 Nursery Management	
PISc 461 Tree Fruit Production Techniques	
PISc 463 Vegetable Crops	
PISc 464 Landscape Maintenance	
Two of the following courses	5-8
PISc 305 Introduction to Plant Pathology	
PISc 462 Greenhouse Management	
Ent 217 Introduction to Integrated Pest Management	
Genet 314 General Genetics	
LArch 288 Plant Materials	
Soils 205, 206 General Soils & Lab	

PLANT PROTECTION MINOR

Course	Credits
Ent 211 General Entomology	4
Ent 217 Introduction to Integrated Pest Management	2
Ent 491 Principles of Integrated Pest Management	3
PISc 305 Introduction to Plant Pathology	4
PISc 338 Weed Control	3
PISc 440 Economic Nematology	3
One of the following courses	2-3
Ent 322 Economic Entomology	
Ent 447 Biological Control of Arthropod Pests & Weeds	
PISc 410 Biology of Weeds	
PISc 475 Postharvest Pathology	

SOIL SCIENCE MINOR

Course	Credits
Soils 205, 206 General Soils & Lab	4
At least four of the following courses	12-16
Soils 415 Soil Physics	
Soils 422 Soil Chemistry	
Soils 425 Microbial Ecology	
Soils 446 Soil Fertility	
Soils 454 Soil Development & Classification	
Courses selected from the following to total at least 18 cr for the minor	0-2
Soils 354 Soil Resources & Land Use Planning	
Soils 365 Soil Conservation & Management	
Soils 417 Soil Clay Mineralogy	
Soils 447 Soil Fertility Management	
Bot 413 Mineral Nutrition	

Department of Political Science

Alwyn R. Rouyer, Head, Dept. of Political Science and Public Affairs Research (205 Admin. Bldg.). Faculty: Donald W. Crowley, Florence A. Heffron, Richard C. Hirst, William R. Lund, Alwyn R. Rouyer, Daniel G. Zirker.

Most decisions in modern society depend to some extent on the workings of the political process. Debate over the role of government vis-a-vis the individual has continued since the time of Plato and Aristotle. Political science as a discipline encompasses a broad range of subfields that attempt to describe and explain the political process, politics, and the relationships among governments. The general areas of study in political science include American government and politics, political theory, public administration, public law, comparative politics, and international relations.

The political science program at UI is designed to provide students with a comprehensive selection of introductory and advanced courses in the above areas in order to give them the background necessary to pursue a variety of potential career objectives. Students have a choice of either a Bachelor of Arts or a Bachelor of Science degree. The B.S. degree places emphasis on computer science and statistics; the B.A. provides a more traditional liberal-arts track. All students are required to take a course in political theory and one in research methods. Students are also expected to take at least three courses in both the domestic (American) politics area and the foreign politics area. Beyond this, the student normally will specialize in one or two of the general subfields depending on his or her career plans. For instance, a prelaw major would take a heavier load in public law courses while a student interested in the foreign service would take more courses in international relations and foreign policy.

The department encourages students to gain practical experience in government by awarding up to six credits for internships. Here the student works either in the legislature, the executive branch, or on a political campaign. In the past, students have interned in most of the state executive agencies, including the governor's office, with congressmen and senators in Washington, D.C., and on political campaigns from the local to the national level.

The department places emphasis both on solid classroom preparation for a variety of career objectives and practical research and internship experience. Students benefit from close contact with instructors both in and out of the classroom and are given individual attention in designing programs of study to fit best their interests. The department encourages innovative teaching techniques among its faculty and in-class participation of its students. Recent examples include a Model United Nations program, and a variety of games and simulations designed to educate the student in decision making.

The Bureau of Public Affairs Research is an integral part of the department. Since its founding, the bureau has completed many research projects concerned with a broad spectrum of state and local government activities, policies, and politics. In addition to its research function, the bureau offers training services for both state and local governmental officials. The bureau also provides consulting services to state and local agencies.

Three graduate degrees are offered by the department: Master of Arts, Master of Public Administration, and Doctor of Philosophy. More information about these programs may be found in the Graduate Bulletin.

Political Science Courses

PREREQUISITES: Two-semester courses in this field may be taken in either order. Students may enroll in second-semester courses without having had the first.

PolSc **101 Introduction to American Politics** (3 cr) (C). Satisfies core requirement J-3-d. Basic concepts, processes, and major structural elements of the national government.

PolSc **C102 U.S. Government: Policies and Issues** (3 cr). Survey of major policies and issues conflicts in the U.S.

PolSc **105 Introduction to Political Science** (3 cr). Satisfies core requirement J-3-d. Principles of political science and nature of the discipline; comparative processes in political systems; ideas and theories of politics; problems of governments; international politics.

PolSc **C152 Politics and Pollution** (1 cr) (C). Political, government, and administrative aspects of overcoming air, water, and other types of pollution of our environment.

PolSc **200** (s) **Seminar** (cr arr). Prereq: perm.

PolSc **203** (s) **Workshop** (cr arr). Prereq: perm.

PolSc **204** (s) **Special Topics** (cr arr).

PolSc **237 International Politics** (3 cr). Survey of major issues and approaches to international politics by major powers; evaluation of concepts such as power politics, internationalism, and communism; intro to other courses in the area.

PolSc **275 American State and Local Government** (3 cr) (C). State and local politics, parties, interest groups, constitutions, legislative, executive, and judicial branches, intergovernmental relations; key issues in state and local policies.

PolSc **299** (s) **Directed Study** (cr arr). Graded P/F. Prereq: perm.

PolSc **ID380 Canadian Political System** (3 cr). WSU Pol S 380. General exam of Canadian cultural identity, constitutional prin, federalism, govt structure, political process, and electoral behavior.

PolSc **381 Politics of Western Europe** (3 cr). Comparison of political systems of Britain and selected European nations; evaluation of European Community; their relation to new governments of Eastern Europe.

PolSc **382 Communist Politics** (3 cr). Politics and foreign policies of the Soviet Union, China, and other Communist nations; emphasis on challenges of Communism.

PolSc **400** (s) **Seminar** (cr arr). Prereq: perm.

PolSc **403** (s) **Workshop** (cr arr). Prereq: perm.

PolSc **404** (s) **Special Topics** (cr arr).

PolSc **ID&WS405 Israel/Palestine Program** (3 cr). WSU Pol S 421. Cooperative program between UI and WSU in Jerusalem; offered during summer session; various topics related to Israel and Middle Eastern politics and society. Orientation at UI or WSU and 15-21 days of study and travel in Israel and the Occupied Territories.

PolSc **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

PolSc **WS-J412/WS-J512 Government of the U.S.S.R.** (3 cr). WSU Pol S 412/512.

PolSc **WS422 Public Administration and Program Management in Developing Countries** (3 cr). WSU Pol S 422.

PolSc **J425/J525 History of Political Philosophy I** (3 cr). Perennial problems of politics examined through study of seminal authors of classical antiquity (Plato, Aristotle, Cicero); medieval confrontation of theology with classical political philosophy (Augustine, Aquinas, Marsilius). Additional projects/assignments reqd for grad cr.

PolSc **J426/J526 History of Political Philosophy II** (3 cr). Foundations of modern liberalism in severing of the problem of political order from that of the order of the soul, collectivist attack on liberalism as based on radicalization of that same project; study of authors incl Machiavelli, Hobbes, Locke, Rousseau, and Marx. Additional projects/assignments reqd for grad cr.

PolSc **J428/J528 American Political Thought** (3 cr). Representative democracy as understood by the Founders, Lincoln, the Progressives, New Deal writers, the New Left, and contemporary liberalism and conservatism. Additional projects/assignments reqd for grad cr.

PolSc **J429/J529 Contemporary Political Ethics** (3 cr). Current controversies concerning status and substance of ethical claims about deception, violence, coercion, and econ justice on politics and public actors. Additional projects/assignments reqd for grad cr.

PolSc **430 Political Participant Internship** (1-9 cr, max 9). Directed student internship as a participant-observer in the political process, work during a campaign with a candidate, party, or interest group. Graded P/F. Prereq: perm.

PolSc **431 American Political Parties and Elections** (3 cr). Dev and present character of American political parties and of electoral system, functions of parties in periods of relative consensus and of critical choice regarding fundamental prin, party reform, and future prospects for party system.

PolSc **432 American Congress** (3 cr). Theories of representation, recruitment of legislators, legislative organization and behavior, structure of power, relationship to the executive, lobbying, and role in the political system.

PolSc **433 American Political Culture** (3 cr). Relation of public opinion and political action and affiliation to broad econ, social, religious, and intellectual developments.

PolSc **435 Political Research Methods and Approaches** (3 cr). Dev of research designs; methods of data collection; measurement of political phenomena; data analysis and the use of stat; data processing tech. Prereq: Stat 251.

PolSc **J437/J537 American Presidency** (3 cr). Roles, power, and functions of the presidency; relationships with other structures and institutions in the U.S. political system. Additional projects/assignments reqd for grad cr.

PolSc **438 Conduct of American Foreign Policy** (3 cr). Foreign policy, incl roles of Dept of State and its missions, the President, National Security Council, Congress, military, public opinion and interest groups.

PolSc **J439/J539 Public Policy** (3 cr). Processes by which domestic policies are formulated and administered; analysis of intentional and unintentional impact of these policies on society. Additional projects/assignments reqd for grad cr.

PolSc **J440/J540 International Organizations and International Law** (3 cr). Same as Mrtn 496. League of Nations, United Nations, and role of international law in international

relations; the UN's contribution to international security and econ and social dev. Additional projects/assignments reqd for grad cr.

PolSc **WS-J445/WS-J545 Public Personnel Administration** (3 cr). WSU Pol S 445/545.

PolSc **447 Political Systems of East Asia** (3 cr). Chinese and Southeast Asian govts.

PolSc **J449/J549 World Politics and War** (3 cr). Problems of war since 1914; arms limitation attempts, incl international nuclear force (INF) agreement. Additional projects/assignments reqd for grad cr. Cr not granted for both PolSc 449 and Mrtn 490.

PolSc **451 Public Administration** (3 cr) (C). Environment of public admin, politics of organizations, public decision-making, public relations, leadership, personnel admin, financial admin, admin morality; related topics.

PolSc **452 Administrative Law and Regulation** (3 cr). Rule-making, adjudication, and other modes of regulation of admin agencies; judicial review and Congressional oversight of admin acts.

PolSc **J453/J553 Public Management Techniques** (3 cr). Staff tech important to persons entering many types of admin work in govt and other agencies; personnel, mgt, surveys, data processing, budgeting, purchasing, and public relations. Additional projects/assignments reqd for grad cr.

PolSc **J454/J554 Public Organization Theory** (3 cr). Organization theory and behavior in public and nonprofit sector, organization structure and environment, individual behavior in organizations. Additional projects/assignments reqd for grad cr.

PolSc **458 Management Internship** (1-9 cr, max 9). Directed internship in an agency of federal, state, or local govt or special projects involving federal, state, or local govt. One cr for each week of internship work. Graded P/F. Prereq: perm.

PolSc **459 Legislative Internship** (1-9 cr, max 9). Directed internship in a national, state, municipal, or corporate legislative body. Supervised work experience. Report required. Graded P/F. Prereq: perm.

PolSc **460 Law and Society** (3 cr) (PolSc 360). Overview of legal reasoning and functions of law in society; emphasis on capacity of law to affect social change as well as ways in which law responds to social change.

PolSc **J464/J564 Politics of the Environment** (3 cr). Political factors that influence formation, implementation, and impact of public policies aimed at protecting the environment. Additional projects/assignments reqd for grad cr.

PolSc **465 Politics and the Economy** (3 cr). Analysis of factors that influence political institutions in making econ policy.

PolSc **J467/J567 Constitutional Law** (3 cr). The Supreme Court as a constitutional policymaker; federal jurisdiction; constitutional prin concerning judicial review, federalism, implied powers, separation of powers, and due process. Additional projects/assignments reqd for grad cr.

PolSc **J468/J568 Civil Liberties** (3 cr). The Supreme Court and its role in protecting civil liberties; freedom of speech, press, and religion; due process, the Bill of Rights, and its appl to the states; criminal justice. Additional projects/assignments reqd for grad cr.

PolSc **J469/J569 The Judicial Process** (3 cr). Judicial and legal processes, court structure, procedures; judicial behavior and decision-making; selection of judges. Additional projects/assignments reqd for grad cr.

PolSc **J471/J571 Intergovernmental Relations** (3 cr). Relationships among federal, state, and local units of govt; legal and fiscal relationships, grant admin, forms of cooperation, the council-of-govt movement, transfers of power, and policy making. Additional projects/assignments reqd for grad cr.

PolSc **J480/J580 Politics of Development** (3 cr). Role of the state in dev, political economy of change, transition to democracy in the Third World, problems of ethnic conflict, overpopulation, and poverty. Additional projects/assignments reqd for grad cr.

PolSc **J482/J582 Latin American Politics** (3 cr). Comparative description and analysis of distinctive Latin American political institutions and processes; cultural influences; basic institutions; dependency and dev; authoritarianism and democratization; international dimensions. Additional projects/assignments reqd for grad cr.

PolSc **J483/J583 Middle Eastern Politics** (3 cr). Comparative analyses of political processes in Middle East and North Africa, Islam and politics, role of the military, and Arab-Israeli conflict. Additional projects/assignments reqd for grad cr.

PolSc **ID-J484/J584 Politics of India and the Subcontinent** (3 cr). WSU Asia 484. Comparative analysis of the political process in India, Pakistan, Bangladesh, Sri Lanka, and Nepal; hist dev; cultural and social influences on politics; political institutions and behavior. Additional projects/assignments reqd for grad cr.

PolSc **J485/J585 African Politics** (3 cr). Comparative description and analysis of politics of Africa south of the Sahara, colonialism, nationalism, and econ problems; politics of selected African countries examined incl South Africa and apartheid. Additional projects/assignments reqd for grad cr.

PolSc **487 Political Violence and Revolution** (3 cr). Comparative analyses of causes of revolutions and other forms of violent civil conflict; exam of nature of guerilla warfare, terrorism, and military intervention in politics with special emphasis on the Third World. Cr not granted for both PolSc 487 and Mrtn 491.

PolSc **499** (s) **Directed Study** (cr arr). Prereq: perm.

PolSc **500 Master's Research and Thesis** (cr arr). Graded P/F.

PolSc **501** (s) **Seminar** (cr arr). Areas normally offered incl U.S. politics, U.S. foreign policy, African and Asian politics, community power and politics, U.S. political thought, public law, public admin, and political dev. One 2-day field trip is authorized for the seminar in public admin. Prereq: perm.

PolSc **502** (s) **Directed Study** (cr arr). Prereq: perm.

PolSc **503** (s) **Workshop** (cr arr). Prereq: perm.

PolSc **504** (s) **Special Topics** (cr arr).

PolSc **WS512 Government of the U.S.S.R.** (3 cr). See PolSc J412/J512.

PolSc **525 History of Political Philosophy I** (3 cr). See PolSc J425/J525.

PolSc **526 History of Political Philosophy II** (3 cr). See PolSc J426/J526.

PolSc **528 American Political Thought** (3 cr). See PolSc J428/J528.

PolSc **529 Contemporary Political Ethics** (3 cr). See PolSc J429/J529.

PolSc **WS530 Scope of Political Science** (3 cr). WSU Pol S 530.

PolSc **WS531 Research Methods in Political Science** (3 cr). WSU Pol S 531.

PolSc **537 American Presidency** (3 cr). See PolSc J437/J537.

PolSc **539 Public Policy** (3 cr). See PolSc J439/J539.

PolSc **540 International Organizations and International Law** (3 cr). See PolSc J440/J540.

PolSc **WS545 Public Personnel Administration** (3 cr). See PolSc J445/J545.

PolSc **549 World Politics and War** (3 cr). See PolSc J449/J549.

PolSc **551 Seminar in Public Administration** (3 cr). Review of significant issues and methodological problems in the field.

PolSc **553 Public Management Techniques** (3 cr). See PolSc J453/J553.

PolSc **554 Public Organization Theory** (3 cr). See PolSc J454/J554.

PolSc **ID555 Seminar in Administrative Theory** (3 cr) (PolSc ID552). WSU Pol S 552. Alt/yrs. Major writers in political theory and concepts such as leadership, supervision, authority, decision-making, and human relations.

PolSc **ID556 Governmental Policy and Program Analysis** (3 cr). WSU Pol S 556. Tech used to analyze policy alternatives and to evaluate program; developing program objectives, mgt by objectives, productivity analysis, program evaluate, and policy analysis.

PolSc **557 Governmental Budgeting** (3 cr). Theory and tech of govt budget prep and analysis; line item budgeting, performance budgets, PPB, and zero base budgeting; automation applications in the budget process.

PolSc **WS561 Seminar in U.S. National Security Policy** (3 cr). WSU Pol S 561. U.S. defense and arms control policies; current strategies and weapons issues.

PolSc **564 Politics of the Environment** (3 cr). See PolSc J464/J564.

PolSc **567 Constitutional Law** (3 cr). See PolSc J467/J567.

PolSc **568 Civil Liberties** (3 cr). See PolSc J468/J568.

PolSc **569 The Judicial Process** (3 cr). See PolSc J469/J569.

PolSc **571 Intergovernmental Relations** (3 cr). See PolSc J471/J571.

PolSc **575 Public Personnel Administration** (3 cr). Personnel admin in public agencies; hist of the personnel and merit systems; recruitment, selection, training, and evaluate of administrators; collective bargaining and political activity in public service; personnel admin and democracy.

PolSc **580 Politics of Development** (3 cr). See PolSc J480/J580.

PolSc **582 Latin American Politics** (3 cr). See PolSc J482/J582.

PolSc **583 Middle Eastern Politics** (3 cr). See PolSc J483/J583.

PolSc **584 Politics of India and the Subcontinent** (3 cr). See PolSc J484/J584.

PolSc **585 African Politics** (3 cr). See PolSc J485/J585.

PolSc **WS589 Seminar: International Politics** (3 cr). WSU Pol S 589.

PolSc **590 Seminar in U.S. Foreign Policy** (3 cr). Methodology, decision-making institutions and processes, principal instruments.

PolSc **ID&WS591 Seminar in Public Policy Formation** (3 cr). WSU Pol S 591.

PolSc **ID&WS592 Topics in Public Administration** (3 cr). WSU Pol S 592.

PolSc **ID&WS593 Seminar in Public Law** (3 cr). WSU Pol S 593. Emphasis on substantive law or judicial process.

PolSc **ID&WS594 Seminar in Political Theory** (3 cr). WSU Pol S 594.

PolSc **ID&WS595 Seminar in Comparative Politics** (3 cr). WSU Pol S 595.

PolSc **598** (s) **Internship** (cr arr). Prereq: perm.

PolSc **600 Doctoral Research and Dissertation** (cr arr). Graded P/F.

Curricular Requirements

POLITICAL SCIENCE (B.A.)

Required course work includes the university requirements (see regulation J-3), the general requirements for the B.A. degree, and:

Course	Credits
PolSc 101 Intro to American Politics or 105 Intro to Political Science	3
Stat 251 Principles of Statistics	3
Introductory courses in other social sciences	6
Additional political sc courses numbered 150 or above (minimum of 23 cr reqd in upper-div courses; total to incl PolSc 435, at	

least 3 cr in PolSc 425 or 426, and at least two courses in American govt area and two in foreign politics area—one in international relations and one in comparative politics) 29
Upper-division related field courses 20

Note: A maximum of 6 credits of political science internship and/or directed study courses may be counted toward meeting the political science credit requirements. The choice of specific electives must be approved by the department.

POLITICAL SCIENCE (B.S.)

Required course work includes the university requirements (see regulation J-3), the general requirements for the B.S. degree, and:

Course	Credits
PolSc 105 Intro to Political Science or 101 Intro to American Politics	3
Math 111 Finite Math or 140 Pre-calculus Algebra & Analytic Geom or 180 Analytic Geom & Calculus I	3-4
Stat 251 Principles of Statistics	3
Introductory courses in other social sciences	6
Additional political sc courses numbered 150 or above (minimum of 23 cr reqd in upper-div courses; total to incl PolSc 435 and at least 3 cr in PolSc 425 or 426)	29
Research methods in the behavioral sc, stat, data processing, or computer programming (may be counted as related field cr if upper-division)	6
Upper-division related field courses	20

Note: A maximum of 6 credits of political science internship and/or directed study courses may be counted toward meeting the political science credit requirements. The choice of specific electives must be approved by the department.

Academic Minor Requirements

AMERICAN GOVERNMENT/PUBLIC LAW MINOR

Note: Approved political science seminars may be substituted in this minor.

Course	Credits
PolSc 101 Intro to American Politics or 105 Intro to Political Science	3
Two courses from the following (American Institutions)	6
PolSc 275 American State & Local Govt	
PolSc 428 American Political Thought	
PolSc 431 American Political Parties & Elections	
PolSc 432 American Congress	
PolSc 433 American Political Culture	
PolSc 437 American Presidency	
PolSc 439 Public Policy	
PolSc 464 Politics of the Environment	
PolSc 471 Intergovernmental Relations	
Two courses from the following (Public Law)	6
PolSc 429 Contemporary Political Ethics	
PolSc 452 Administrative Law & Regulation	
PolSc 460 Law & Society	
PolSc 467 Constitutional Law	
PolSc 468 Civil Liberties	
PolSc 469 The Judicial Process	
Additional courses from American Institutions or Public Law listed above	6

FOREIGN AND INTERNATIONAL POLITICS MINOR

Note: Approved political science seminars may be substituted in this minor. Either Econ 474 or 477 may be used for credit in this minor.

Course	Credits
PolSc 105 Introduction to Political Science	3
PolSc 237 International Politics	3
Courses in the following two areas (at least 3 cr in each area)	15
International Relations	
PolSc 438 Conduct of American Foreign Policy	
PolSc 440 International Organizations & International Law	
PolSc 449 World Politics & War	
PolSc 487 Political Violence & Revolution	
Comparative Politics	
PolSc 380 Canadian Political System	
PolSc 381 Politics of Western Europe	
PolSc 382 Communist Politics	
PolSc 447 Political Systems of East Asia	
PolSc 480 Politics of Development	
PolSc 482 Latin American Politics	
PolSc 483 Middle Eastern Politics	
PolSc 484 Politics of India & Subcontinent	
PolSc 485 African Politics	

POLITICAL SCIENCE MINOR

Note: Approved political science seminars may be substituted in this minor.

Course	Credits
PolSc 101 Intro to American Politics or 105 Intro to Political Science	3
PolSc 425 History of Political Philosophy I or 426 History of Political Philosophy II or 428 American Political Thought	3
Three courses in American government/policy (only one course may be numbered below 300)	9
Two courses in international relations/comparative government (only one course may be numbered below 300)	6

PUBLIC ADMINISTRATION MINOR

Note: Approved political science seminars may be substituted in this minor.

Course	Credits
PolSc 101 Intro to American Politics or 105 Intro to Political Science	3
PolSc 275 American State & Local Govt	3
PolSc 451 Public Administration	3
Four courses from the following	12
PolSc 439 Public Policy	
PolSc 452 Administrative Law & Regulation	
PolSc 453 Public Management Techniques	
PolSc 454 Public Organization Theory	
PolSc 464 Politics of the Environment	
PolSc 471 Intergovernmental Relations	
PolSc 556 Governmental Policy & Program Analysis	
PolSc 557 Governmental Budgeting	

Department of Psychology

Robert J. Gregory, Dept. Chair (103 Psych. Bldg.). Faculty: James E. Crandall, Thomas A. Dingus, Bruce S. Fogas, Douglas J. Gillan, Sallie E. Gordon, Robert J. Gregory, Maria Krasnec, Steven E. Meier, Philip J. Mohan, Valerie J. Steffen, Mark F. Yama.

Psychology involves the study of thinking, feeling, and behavior. These broad categories include such things as how we perceive and process information from the environment, principles of learning and higher thought processes, emotion and motivation, physiological factors, social behavior, personality, adjustment and abnormality, and developmental processes. The focus is on understanding the varieties of behavior and experience and how they come about. Knowledge of methods of investigation and current research findings are important to this understanding.

A basic understanding of the factors influencing human behavior and experience is highly desirable for effective functioning in our increasingly complex and sometimes puzzling society. The major in psychology (leading to either a B.A. or a B.S. degree) is designed to provide a worthwhile focus for a liberal-arts education. The major can also provide a valuable background for a variety of careers in business, industry, government, or the helping professions. It is also designed to prepare interested students for graduate training that can lead to a professional degree in psychology. The focus of the department is on human psychology. Laboratory equipment includes a variety of devices for studying perception and learning, several microcomputers, and apparatus for physiological recording and biofeedback training. Several research spaces and interviewing or therapy rooms are available.

The department offers an M.S. in clinical psychology and in human factors. The B.S. or B.A. degree in psychology is the recommended preparation for study, though related study or experience in the field will also be recognized. Each of the graduate specialties normally requires two years for completion of the degree. The first year is devoted to extensive preparatory course work; the second year emphasizes practicum and thesis work.

Psychology Courses

PREREQUISITE: Unless otherwise stated, Psych 100 is a prerequisite to all other courses in this field. Unless a prerequisite is specifically stated, the prerequisite to all graduate courses is permission of department and instructor.

Psych **100 Introduction to Psychology** (3 cr) (C). Satisfies core requirement J-3-d. Intro to psychology topics, including sensation and perception, learning and thinking, motivation, personality and adjustment, social processes, psychological testing; emphasis on fundamental principles.

Psych **200** (s) **Seminar** (cr arr). Prereq: perm.

Psych **203** (s) **Workshop** (cr arr). Prereq: perm.

Psych **204** (s) **Special Topics** (cr arr).

Psych **218 Introduction to Research in the Behavioral Sciences** (4 cr). Primarily for majors in psychology. Logic and method of empirical research in the behavioral sciences; design, execution, and reporting of psychological experimentation and research. Three lec and one 2-hr lab a wk. Prereq: Math 111 or 140, or equiv.

Psych **299** (s) **Directed Study** (cr arr). Prereq: perm.

Psych **305 Developmental Psychology** (3 cr) (C) (Psych 205). Conception to preadolescence; genetics, anatomy, physiology, biological changes during development, learning, socialization, cognition, and personality.

Psych **309 Personality and Social Development in Children** (3 cr) (C). Personality and social development from birth to adolescence, including areas of attachment, aggression, impulse control, sex differences, development of a sense of self, conscience development, and effects of parental childrearing styles upon child. Prereq: Psych 218, 305.

Psych **310 Psychology of Personality** (3 cr) (C). Theories of personality, basic concepts, techniques of measurement, and experimental methods; the normal personality.

Psych **311 Abnormal Psychology** (3 cr) (C). Nature, causes, treatment, and prevention of patterns of emotional disturbances and personality disorders, including neuroses and psychoses.

Psych **316 Industrial Psychology** (3 cr). Contributions of experimental, social, counseling, and clinical psychology to the everyday problems of organization; emphasis on industrial organizations.

Psych **320 Introduction to Social Psychology** (3 cr) (C). Theories, concepts, and research on the social bases of behavior and social interaction; topics of personal and social relevance, aggression, prejudice, altruism and helping behavior, interpersonal attraction, behavior in groups, conformity, attitudes, authoritarianism, and obedience to authority. Prereq: Psych 218.

Psych **J325/J525 Cognitive Psychology** (3 cr). Survey and analysis of major topics in field; emphasis on contemporary research and theory; related topics in perception, memory, and information processing and transformation. Additional projects/assignments reqd for grad cr. Prereq: Psych 218 or perm.

Psych **330 Human Sexuality** (3 cr) (C) (Psych 210). Intro to the fundamentals of human sexuality; emphasis on current trends and research. No prereq.

Psych **340 Parapsychology** (3 cr). Critical examination of methods of inquiry and evidence relating to such topics as extrasensory perception, psychokinesis, precognition, and survival of death.

Psych **372 Physiological Psychology** (3 cr) (Psych 441). Physiological bases of animal and normal human behavior. Prereq: Biol 201-202, Zool 119, or perm.

Psych **390 Psychology of Learning** (3 cr). Experimental literature of the nature and conditions of classical and operant conditioning, verbal learning, and cognition. Prereq: Psych 218.

Psych **400** (s) **Seminar** (cr arr). Prereq: perm.

Psych **403** (s) **Workshop** (cr arr). Prereq: perm.

Psych **404** (s) **Special Topics** (cr arr).

Psych **409 Cognitive Development** (3 cr). Intellectual development of child from birth to maturity, mechanisms of intellectual growth, relationship between language and cognitive development. Prereq: Psych 218, 305.

Psych **411 Psychotherapy: Theory and Practice** (4 cr). Critical examination of what components make psychotherapy effective; evaluation of current theories of therapy and historical influences; additional emphasis on requisite skills necessary for psychotherapist. Three lec and one 2-hr lab a wk.

Psych **419 Psychology of Aging** (3 cr). Analysis of intellectual and memory changes with aging; diagnosis of senile dementia and pseudodementia; study of psychological problems of aging, plasticity of functioning, and ingredients of successful aging.

Psych **ID422 Aggression** (3 cr). WSU Psych 352. Theories, concepts, and research on aggression at individual and group levels; origin of aggression; murder; effects of mass media; deindividuation; sex differences; social, cognitive, learning, and environmental influences.

Psych **444 Sensation and Perception** (3 cr). Fundamental processes and variables in sensory, perceptual, and cognitive experiences of humans. Prereq: Psych 218.

Psych **446 Engineering Psychology** (3 cr). Application of principles of experimental psychology to analysis of interaction of the human operator with machine systems and work environments; emphasis on psychological aspects of human performance.

Psych **455 Psychology of Motivation** (3 cr). Biological and social variables influencing the activation, direction, and self-maintenance of behavior. Prereq: 6 cr in psychology.

Psych **J495/J595 Professional Issues and Ethics in Psychology** (3 cr). In-depth analysis of professional and ethical issues faced by psychologists in their roles as practitioners, researchers, consultants, teachers, etc.; exploration of controversies, political and logistic problems facing psychologists, and the helping professions in general. Two hrs of "Case Review Board" a month reqd for graduate credit.

Psych **496 Applied Behavior Analysis** (3 cr). Analysis and assessment of behavior in real-life settings, e.g., home, business, industry, and institutions such as prisons and psychiatric hospitals; structured programs of intervention and assessment of behavior change; special emphasis on self-management of behavior. Prereq: Psych 218 and 390.

Psych **498 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

Psych **499** (s) **Directed Study** (cr arr). Prereq: perm.

Psych **500 Master's Research and Thesis** (cr arr).

Psych **501** (s) **Seminar** (cr arr). Prereq: perm.

Psych **502** (s) **Directed Study** (cr arr). Prereq: perm.

Psych **503** (s) **Workshop** (cr arr). Prereq: perm.

Psych **504** (s) **Special Topics** (cr arr).

Psych **505 Current Topics in Developmental Psychology** (3 cr). Recent research in selected area. Prereq: perm.

Psych **511 Intellectual Assessment** (3 cr). Assessment of intellectual ability and brain impairment in the individual; relevant history, concepts, and supervised practice in test administration; interpretation and report writing. Prereq: perm.

Psych **513 Community Psychology** (3 cr). Theory, research, and issues, including strategies and intervention for the mental health professional.

Psych **WS520 Advanced Social Psychology** (3 cr). WSU Psych 550.

Psych **525 Cognitive Psychology** (3 cr). See Psych J325/J525.

Psych **528 Descriptive Psychopathology** (3 cr). Assessment, description, and classification of adult psychopathology; supervised practice in administration and interpretation of objective tests of psychological disturbance.

Psych **530 Introduction to Clinical Psychology** (3 cr). Practical, theoretical, social-professional, and ethical aspects of psychotherapy.

Psych **540 Personality Assessment** (3 cr). Issues and supervised practice in administration, scoring, and interpretation of the most frequently used devices. Prereq: Psych 511, 528, 530, and perm of dept.

Psych **545 Advanced Clinical Psychology** (3 cr). Theory, research, and techniques of psychotherapy. Prereq: Psych 530 and perm.

Psych **550 Training and Skill Acquisition** (3 cr). Application of learning theory to real-world training problems; review of current research and techniques for training and skill acquisition.

Psych **552 Ergonomics and Biomechanics** (3 cr). Principles of anthropometry, biomechanics, and work physiology applied to workplace.

Psych **555 Safety Analysis** (3 cr). Effect of environmental, job, and personal stressors on work performance; systems analysis; safety analysis and accident prevention.

Psych **561 Human Factors Design I** (3 cr). Visual and auditory display design, evaluation, and selection; physiological and psychological aspects of human-computer interaction. Prereq: Psych 325, Psych 444, ME 409, or perm.

Psych **562 Human Factors Design II** (3 cr). Manual Control Theory and applications; design and evaluation techniques for complex human/system interfaces. Prereq: Psych 446, ME 409, or perm.

Psych **563 Human Factors Design Lab** (3 cr). Application of design and evaluation principles and techniques to real world problems. Prereq: Psych 561, 562.

Psych **WS570 Psychology of Visual Perception** (3 cr). WSU Psych 585.

Psych **585 Research Methods** (3 cr). Philosophy of research, types of design, data analysis, research report. Prereq: Stat 401 or equiv.

Psych **590 Child Clinical Psychology** (3 cr). Etiology and description of psychopathology and behavior disorders in children; treatment philosophies and techniques; disc of case studies, research, and adolescence. Prereq: perm.

Psych **595 Professional Issues and Ethics in Psychology** (3 cr). See Psych J495/J595.

Psych **597** (s) **Practicum** (cr arr). Prereq: perm.

Psych **598** (s) **Internship** (cr arr). Prereq: perm.

Psych **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Curricular Requirements

PSYCHOLOGY (B.A. or B.S.)

Note: Psych 100 and Psych 218 must be completed with a grade of C or better and a minimum cumulative GPA of 2.50 must be attained for students seeking upper-division standing in the department. In order to graduate with a degree in psychology, 2.50 GPA must be attained.

Required course work includes the university requirements (see regulation J-3), the general requirements for either the B.A. or B.S. degree, and:

Course	Credits
Psych 100 Introduction to Psychology	3
Psych 218 Introduction to Research in the Behavioral Sciences	4
Biol 100 Intro to Biology or Biol 201 Intro to the Life Sciences	4
CS 100 Intro to Computers & Programming or CS 102 Programming & Problem Solving for Scientists or CS 112 Intro to Problem Solving & Programming	3
Stat 251 Principles of Statistics	3
A grade of C or above in at least three courses from each of the following two groups	18

Personal/Social Bases of Behavior
- Psych 305 Developmental Psychology
- Psych 310 Psychology of Personality
- Psych 311 Abnormal Psychology
- Psych 320 Introduction to Social Psychology

Biological/Experimental Bases of Behavior
- Psych 325 Cognitive Psychology
- Psych 372 Physiological Psychology
- Psych 390 Psychology of Learning
- Psych 444 Sensation & Perception

And a grade of C or above in at least 4 additional upper-division psychology courses (not including Psych 400, 403, 498, or 499).

Academic Minor Requirements

PSYCHOLOGY MINOR

Note: Psych 100 and Psych 218 must be completed with a grade of C or better.

Course	Credits
Psych 100 Introduction to Psychology	3
Psych 218 Introduction to Research in the Behavioral Sciences	4
A grade of C or above in at least two courses from each of the following groups	12
Personal/Social Bases of Behavior	
Psych 305 Developmental Psychology	
Psych 310 Psychology of Personality	
Psych 311 Abnormal Psychology	
Psych 320 Introduction to Social Psychology	
Biological/Experimental Bases of Behavior	
Psych 325 Cognitive Psychology	
Psych 372 Physiological Psychology	
Psych 390 Psychology of Learning	
Psych 444 Sensation & Perception	

And a grade of C or better in at least one additional upper-division psychology course (not including Psych 400, 403, 498, or 499)

Department of Range Resources

Kendall L. Johnson, Dept. Head (205B FWR Bldg.). Faculty: Stephen C. Bunting, John H. Ehrenreich, Minoru Hironaka, Kendall L. Johnson, James L. Kingery, Jeffrey C. Mosley, Ronald Robberecht, Kenneth D. Sanders.

Rangelands are those lands that have vegetation that is predominantly grasses, grass-like plants, forbs, or shrubs suitable for grazing or browsing use by domestic and wild animals. Such lands occupy about 47 percent of the global land area. The proportion of rangeland in the U.S. is approximately the same as for the world as a whole. Idaho's rangelands, however, comprise nearly 70 percent of the total land area of the state, thus emphasizing the geographic and economic importance of these lands to the citizens of Idaho.

Rangelands provide habitat for many species of plants and animals, contain minerals for a variety of uses necessary to maintain and enhance the nation's productive capacity and quality of life, produce forage for domestic livestock and wildlife species, yield water for domestic, agricultural, and industrial uses, and provide open space for a broad spectrum of outdoor recreational activities.

Sound management of rangelands based on ecological principles is required if society is to gain the full measure of products, benefits, and values that these resources offer. The range resources curriculum at UI prepares students for the scientific management of rangelands within a variety of career opportunities. The Department of Range Resources in the College of Forestry, Wildlife and Range Sciences offers a program leading to the degree of Bachelor of Science in Range Resources. In addition, the range program provides ample opportunity for students to broaden their knowledge and skills in other areas of natural resource management, such as fish and wildlife, forestry, watershed, recreation, soils, agricultural economics, and animal science. Field study and evaluation of plant and animal communities are integral parts of the curriculum in range resources. Internships with public land management agencies and private livestock enterprises add to the educational opportunities in the program. On-campus computer terminal availability and modern library facilities also enhance the teaching and learning processes available to students.

The degree of Master of Science in Range Resources is offered in the department and the Doctor of Philosophy degree is offered in the college with a major in forestry, wildlife, and range sciences. Graduate applicants should normally have completed an undergraduate major in range resources management with training in the biological, physical, and social sciences equivalent to that required for the B.S.Range Res. at UI. Applicants lacking this preparation will be required to make up deficiencies as needed.

A library orientation session during the first semester on campus is required for all undergraduates.

Prospective students in range resources are urged to contact the departmental office for further information (208/885-6536).

Range Resources Courses

PREREQUISITE: Courses in this subject field numbered above 299 are not open to any undergraduate student who is on academic probation.

Range **200** (s) **Seminar** (cr arr). Prereq: perm.

Range **203** (s) **Workshop** (cr arr). Prereq: perm.

Range **204** (s) **Special Topics** (cr arr).

Range **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Range **221 Forest Ecology** (3 cr). See For 221.

Range **299** (s) **Directed Study** (cr arr). Prereq: perm.

Range **301 Wildland Ecology** (4 cr). See For 301.

Range **351 Elements of Range Management** (3 cr). Range industry, grazing regions, production and use of forage, improvement and reseeding, surveys and management plans; relation to other phases of wildland management. Prereq: general bot or perm.

Range **358 Natural Resources of the World** (3 cr). Forest, range, wildlife, fisheries, recreation, soil, water, and mineral resources of the world: their occurrence and nature as well as current and future use and demands including international trade, tourism, and conservation.

Range **367 Wildland Fire Management** (2 cr). See For 367.

Range **397-398 Renewable Natural Resources Internship I-II** (cr arr). Supervised field experience with an appropriate public or private agency. Reqd for cooperative education students. Graded P/F. Prereq: perm of dept.

Range **400** (s) **Seminar** (cr arr). Prereq: perm.

Range **401 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

Range **403** (s) **Workshop** (cr arr). Prereq: perm.

Range **404** (s) **Special Topics** (cr arr).

Range **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Range **426 Fire Ecology** (2 cr). See For 426.

Range **427 Prescribed Burning Lab** (2 cr). See For 427.

Range **452 Range Communities** (4 cr). Species identification, vegetational composition, physical characteristics, grazing reactions, and management of plant communities in the major range regions. Two lec and two 2-hr labs a wk; two days of field trips. Prereq: Biol 203; prereq or coreq: Bot 241.

Range **453 Rangeland Vegetation Inventory and Analysis** (3 cr). Inventory and monitoring techniques for measuring rangeland vegetation; interpretation of data with respect to range condition and trend, watershed protection, value for livestock and wildlife habitat. Two lec and one field trip/lab a wk. Prereq: Range 351 or perm.

Range **454 Range Improvement and Management Planning** (3 cr). Objectives, methods, and benefits of range-improvement practices and their impact on management; fundamentals of management planning for use of rangeland resources. Two lec and one lab-disc a wk; one 1-wk field trip. Prereq: Range 351, 453.

Range **455-456 Integrated Range Resource Management** (4 cr). Integration and application of principles learned in previous courses to resource management and management planning. Four 2-hr sessions a wk; 7-10 days of field trips. Prereq: Range 351, 452, 453, and For 494 or perm; coreq: Range 454 and For 383.

Range **457 Classification and Identification of Range Plants** (2 cr). Classification, description, and identification of the most important plants found on rangelands in North America. Two 2-hr lec/labs a wk. Prereq: Bot 241 or perm.

Range **J458/ID-J558 Agroforestry** (2 cr). Same as For J458/J558. WSU NATRS 504. Interdisciplinary approach to sustainable land management that involves ecological, social, and economic integration of forest and woodland production with grazing and/or agriculture crops. Particularly suited to students from less-developed countries. Additional projects/assignments reqd for grad cr.

Range **459 Rangeland Ecology** (3 cr). Application of ecological principles in rangeland management; stressing response and behavior of range ecosystems to various kinds and intensity of disturbance and management practice. Two 1-day field trips. Prereq: Range 452 and Biol 331.

Range **498 International Wildland Management** (1-3 cr, max 3). World approaches and problems. Prereq: sr standing and perm.

Range **499** (s) **Directed Study** (cr arr). For the individual student; conferences, library, field, or lab work. Prereq: sr standing, GPA 2.5, and perm.

Range **500 Master's Research and Thesis** (cr arr).

Range **501** (s) **Seminar** (cr arr). Major philosophy, management, and research problems of wildlands; presentation of individual studies on assigned topics. Prereq: perm.

Range **502** (s) **Directed Study** (cr arr). Prereq: perm.

Range **503** (s) **Workshop** (cr arr). Selected topics in the conservation and management of natural resources. Prereq: perm.

Range **504** (s) **Special Topics** (cr arr).

Range **506** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Range **WS525 Experimental Plant Ecology** (3 cr). WSU NATRS 525.

Range **526 Fire Management and Ecology** (3 cr). See For 526.

Range **ID551 Range Ecology: Concepts** (3 cr). WSU NATRS 551. Alt/yrs. Ecological concepts of the nature, dynamics, and distribution of plant communities; secondary successional processes, soil-vegetation relations, and development of vegetation-classification schemes for better land management. Prereq: plant ecology and perm.

Range **552 Restoration Ecology** (2 cr). Restoration of disturbed or damaged ecosystems; fundamental principles from stress physiology and community ecology and review of case studies in restoration ecology used to examine how damaged ecosystems can be restored. Prereq: Range 459 or equivalent course in plant ecology, or perm.

Range **553 Foraging Behavior of Rangeland Herbivores** (2 cr). Behavioral processes of rangeland herbivore foraging, including domestic livestock and wild ungulates; techniques for researching rangeland herbivore foraging behavior; application of theoretical concepts to grazing management.

Range **WS554 International Range Management** (3 cr). WSU NATRS 555.

Range **555 Current Issues in Range Resource Management** (1-3 cr, max 3). Alt/yrs. Investigation and disc of current issues in range resources and closely related fields. Prereq: perm.

Range **ID558 Agroforestry** (2 cr). See Range J458/J558.

Range **ID560 Range Autecology** (3 cr). WSU NATRS 524. Adaptations of individual species in rangeland and forest communities; emphasizing morphological and physiological mechanisms that influence plant establishment, below- and above-ground productivity, plant competition, and grazing sensitivity. Two days of field trips. Prereq: Range 221, Bot 311 or perm.

Range **595** (s) **Problems in World Resources** (1-3 cr, max 3). Prereq: Range 498 or equiv.

Range **597** (s) **Practicum** (cr arr). Prereq: perm.

Range **598** (s) **Internship** (cr arr). Prereq: perm.

Range **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Range **600 Doctoral Research and Dissertation** (cr arr). Prereq: admission to the doctoral program in "forestry, wildlife and range sciences" and perm of dept.

Curricular Requirements

RANGE RESOURCES (B.S.Range Res.)

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
Range 351 Elements of Range Management	3
Range 452 Range Communities	4
Range 453 Rangeland Vegetation Inventory & Analysis	3
Range 454 Range Improvement & Management Planning	3
Range 456 Integrated Range Resource Management	4
Range 459 Rangeland Ecology	3
AnSc 205 Introduction to Animal Nutrition	3
Biol 201 Introduction to the Life Sciences	4
Biol 203 General Botany	4
Biol 331 General Ecology or Range 221 Forest Ecology	3
Bot 241 Systematic Botany	3
Bot 311 Plant Physiology	3
Chem 103 Introduction to Chemistry	4
Chem 275 Carbon Compounds	3
CommG 131 Fundamentals of Public Speaking	2
CS 102 Programming & Problem Solving for Scientists	3
Econ 151, 152 Prin of Econ or 272 Foundations of Econ Analysis	4-6
Eng 317 Tech & Engr Report Writing or 313 Business Writing	3
For 274 Forest Measurement Techniques	1
For 301 Wildland Ecology	4
For 383 Economics for Natural Resource Managers or AgEc 451 Land & Natural Resource Economics	3
For 494 Models for Resource Decisions	4
FWR 101 Forestry Orientation	1
Math 180 Analytic Geometry & Calculus I or 160 Survey of Calculus	4
Soils 205 General Soils	3
Soils 454 Soil Development & Classification	3
Stat 251 Principles of Statistics	3
Library orientation	0

And one of the following emphasis areas:

Range Science Emphasis

Designed for students who want to emphasize an understanding of the biological and ecological aspects of range ecosystems and develop the technical abilities to manage rangelands.

Course	Credits
AnSc 321 Beef Cattle Science or 322 Sheep Science	3
Bot 441 Agrostology	3
ForPr 230 Forest Land Measurements	2
For 275 Aerial Photo Interpretation	2
For 370 Principles of Forest Management	2
For 462 Watershed Management	2
Geol 101, 102 Physical Geology & Lab	4
WLF 390 Principles of Fish & Wildlife Ecology	3
Electives to total 136 credits for the degree	—

Range Management Emphasis

Designed for students who want the basic principles in range resource management but also wish to develop additional expertise in another area such as soil science, fire management, ranch management, business administration, animal science, forest management, or wildlife management. This emphasis area is designed for maximum flexibility by allowing students to achieve specifically stated educational objectives. Entry into the management emphasis requires a 2.5 GPA, at least one semester of enrollment in the department, and a petition to a departmental committee. The emphasis area is developed individually by the student after consultation with his or her adviser.

Course	Credits
Three of the following	7-10
AnSc 321 Beef Cattle Science or 322 Sheep Science	
Bot 441 Agrostology	
ForPr 230 Forest Land Measurements	
For 275 Aerial Photo Interpretation	
Geol 101, 102 Physical Geology & Lab	
One of the following	2-3
For 370 Principles of Forest Management	
For 462 Watershed Management	
WLF 390 Principles of Fish & Wildlife Ecology	
Approved electives to total 136 credits for the degree	—

RECREATION—see the Division of Health, Physical Education, Recreation, and Dance

Religious Studies

Nicholas F. Gier, Coordinator (Admin. 305C).

The following nonsectarian courses are offered by three privately sponsored institutes adjacent to the campus: St. Augustine's Center, the Campus Christian Center, and the L.D.S. Institute of Religion. While these teaching centers are not part of the university, they secure the university's approval of courses and instructors.

Religious Studies Courses

RelSt **101 Introduction to Religious Studies** (3 cr). Intro to academic study of religion by analyzing history and development of Judaism, Christianity, and Islam.

RelSt **104 Biblical History and Thought: Old Testament** (3 cr). History and development of religious thought and practices of the Hebrew, Israelite, and Jewish people as reflected in the writings of the Hebrew Scriptures.

RelSt **105 Biblical History and Thought: New Testament** (3 cr). Development of religious and theological thought of the Christian Scriptures as manifested in the writings of the New Testament.

RelSt **133 Religion and Family** (2 cr). Overview of influence of religion on dating, courtship, marriage, and family life.

RelSt **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

RelSt **321 Twentieth Century Theology** (3 cr). Recent developments in theology, with emphasis on American experience; includes evangelical, process, narrative, black, and feminist theologies.

RelSt **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Course List

Admission to a school of theology involves meeting satisfactorily its entrance requirements, acceptable scholastic records, and possession of personal qualifications essential for effective leadership. The American Association of Theological Schools recommends a broad liberal arts background as the primary preparation for theological studies, along with such appropriate courses in religious studies as may be available at the student's undergraduate institution.

UI does not offer a major in religious studies. The following courses are suggested for students who (1) plan to transfer into a religious studies major at another institution, (2) plan to go to a seminary or theological school, or (3) wish to be introduced to the field of religious studies. The list is divided between "core" courses and "collateral" courses, and is not intended to be exhaustive.

Core Courses	Credits
RelSt 101 Introduction to Religious Studies	3
RelSt 104 Biblical History & Thought: Old Testament	3
RelSt 105 Biblical History & Thought: New Testament	3
RelSt 321 Twentieth Century Theology	3

RelSt 404 Special Topics: Bible Studies....3
Anthr 327 Belief Systems....3
Eng 375 The Bible as Literature....3
Phil 111 World Religions....3
Phil 305 Philosophy of Religion....3
Phil 306 Hinduism, Jainism, & Zoroastrianism....3
Phil 307 Buddhism....3
Phil 308 Confucianism & Taoism....3

Collateral Courses	Credits
RelSt 133 Religion & Family	2
Art 101 Visual Art	3
Art 102 Survey of Art	2
FL/EN 211-212 Classical Mythology	4
FL/EN 441 Ancient Greek Civilization	3
FL/EN 442 Civilization of Ancient Rome	3
FL/GK 341-342 Elementary Greek	8
FL/GK 404 Special Topics: Koine Greek	1-3
Hist 101-102 History of Civilization	6
Hist 446 Medieval Europe	3
Hist 457 History of the Middle East	3
Phil 101 Ethics	3
Phil 103 Problems of Philosophy	3
Psych 320 Introduction to Social Psychology	3
Soc 321 The Community	3

Department of Resource Recreation and Tourism

Edwin E. Krumpe, Acting Dept. Head (19 FWR Bldg.). Faculty: James R. Fazio, Sam H. Ham, Charles C. Harris, John C. Hendee, Edwin E. Krumpe, William J. McLaughlin. Adjunct Faculty: Gary E. Machlis, George H. Savage. Affiliate Faculty: Stewart Allen, David N. Cole, LuVerne D. Grussing, Kenneth W. Kendall, Craig G. MacFarland, Richard A. Meganck, John H. Schomaker, Paul D. Weingart.

Programs in the Department of Resource Recreation and Tourism involve the study of land and its natural resources, the people who use resources for recreational purposes, and the private and governmental institutions that determine how land will be managed. This discipline is an outgrowth of increasing public interest in outdoor recreation and resource-based tourism that ranges from wilderness backpacking and river floating to hang-gliding, cruising, and enjoying the comforts of a resort. The ever-increasing variety of demands and conflicts, and the growing numbers of tourists in all age and cultural groups, has created unprecedented pressures on recreation resources. At the same time outstanding opportunities are being created for the tourism industry. Modern recreation and tourism management attempts to reconcile conflicts and ensure high-quality opportunities of all kinds while at the same time protecting natural, social, and cultural resources for the future.

The educational objective of this curriculum is to provide men and women with the knowledge, skills, and confidence needed to handle a wide array of opportunities now available in resource-based recreation and tourism management. Students receive a solid educational foundation by studying natural resources and their management. This is coupled with courses in the human dimensions of resource use, including a strong emphasis in communication and business. In addition, experiencing outdoor recreation and tourism is emphasized, as well as learning firsthand about its management.

Graduates find employment in private business, in county, state, and national parks, in educational institutions, and in a variety of resource-management agencies such as the U.S. Forest Service, Bureau of Land Management, National Park Service, and others. Some students combine their education in resource recreation and tourism with a second degree in forest, wildlife, or range management to broaden their employability even further. Still others select a foreign language to prepare for work at the international level.

It is department philosophy that graduates should be prepared for the entire spectrum of resource recreation and tourism career opportunities. Careers, however, usually begin in one of five general areas: recreation resource management, natural resource communication, wilderness and nature conservation, tourism and leisure enterprises, or outdoor recreation leadership. Students must select one of the four departmental minors corresponding to these specializations or develop a block of carefully selected electives to provide depth in an area related to recreation resource management.

Faculty members in the department have been chosen to ensure that students can receive instruction and counsel in the entire spectrum of resource recreation and tourism. Advisers are matched, accordingly, with students' career interests.

The B.S. in resource recreation and tourism prepares qualified students for advanced degrees in most recreation resource, park and recreation, or tourism graduate programs. The department offers the M.S., M.F., and Ph.D. degrees, with concentrations in the same areas as the undergraduate options, with the addition of international studies and other highly interdisciplinary areas of research and education related to resource recreation and tourism.

For additional information, consult the department head (telephone 208/885-7911).

Resource Recreation and Tourism Courses

PREREQUISITE: Courses in this subject field numbered above 299 are not open to any undergraduate student who is on academic probation.

ResRc **102 Introduction to Recreation Professions** (1 cr). Same as Rec 102. Intro to recreation and its related management problems, resources, and professional opportunities. Graded P/F.

ResRc **WS181 Introduction to Hospitality Services Industries** (3 cr). WSU H A 181.

ResRc **200** (s) **Seminar** (cr arr). Prereq: perm.

ResRc **203** (s) **Workshop** (cr arr). Prereq: perm.

ResRc **204** (s) **Special Topics** (cr arr).

ResRc **235 Sociology of Natural Resources** (2 cr). See For 235.

ResRc **WS236 Principles of Tourism** (3 cr). WSU H A 235.

ResRc **287 Principles of Wildland Recreation Management** (2 cr). Overview of role of wildland recreation resources in society; integration of wildland recreation management into an overall multiple-use management framework.

ResRc **288 Law Enforcement in Natural Resource Management** (3 cr). Legal considerations, techniques, and ways of handling law enforcement situations in the management of natural resources, especially wildland recreation, fisheries, and wildlife management.

ResRc **299** (s) **Directed Study** (cr arr). Prereq: perm.

ResRc **302 Wildland Recreation Field Studies** (3 cr). Specialized techniques used in wildland measurements; field trips, case studies, and site evaluation. Two wks of all-day summer camp.

ResRc **310 Leisure Services Research and Evaluation** (3 cr). Empirical research methods used in leisure service delivery programs; how to choose and apply selective research methods and software packages; design, collection, and analysis of information; program evaluation; reporting results; interpreting research literature. Prereq: basic computer skills and Stat 251, or perm.

ResRc **311 Leisure Services Research and Evaluation Lab** (1 cr). Lab exercises for experience in designing research; collecting data; using computer technology to collect, analyze, and present information; various research methods. Two hrs of lab a wk. Coreq: ResRc 310.

ResRc **WS381 Hospitality Management and Organization** (3 cr). WSU H A 381.

ResRc **J383/J583 Natural Resource Tourism** (2-3 cr). Alt/yrs. Current methods and approaches to natural resource tourism and its social, economic, and resource impacts; organizations involved and management styles used by travel and tourism industry. Three credits may be earned in ResRc 583 by completing additional reading and a research paper, and by attending 1 additional hr of seminar a wk.

ResRc **384 Recreation Operations and Facilities Management** (2 cr). Functions of a park manager; workload analysis and scheduling, personnel, fiscal planning, permits, and other operations and maintenance tasks. Prereq: ResRc 287.

ResRc **385 Resource Recreation and Tourism Management** (3 cr). Alt/yrs. Comprehensive intro to theory, processes, and techniques for managing natural resources recreation and tourism systems; tourist, resource/attraction, and program management strategies demonstrating budgeting, contracting, and human resource management stressed. Prereq: ResRc 287, 310, or perm.

ResRc **386 Resource Recreation and Tourism Planning** (3 cr). Alt/yrs. Integration of regional area aspects of land use planning relevant to provision of natural resource recreation and tourism opportunities; applied case studies in private and public sector used to demonstrate styles of planning, planning frameworks, and analysis techniques. Prereq: ResRc 287, 310, or perm.

ResRc **387 Environmental Interpretive Methods** (3 cr). Alt/yrs. Communication of natural resource messages by interpreters, naturalists, tour guides, and other wildland managers to user publics. Prereq: ResRc 287, 310, or perm.

ResRc **397-398 Renewable Natural Resources Internship I-II** (cr arr). Supervised field experience with an appropriate public or private agency. Reqd for cooperative education students. Graded P/F. Prereq: perm of dept.

ResRc **400** (s) **Seminar** (cr arr). Prereq: perm.

ResRc **401 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

ResRc **403** (s) **Workshop** (cr arr). Prereq: perm.

ResRc **404** (s) **Special Topics** (cr arr).

ResRc **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

ResRc **486 Public Involvement in Natural Resource Management** (3 cr). Alt/yrs. Theoretical and applied concepts of public involvement in both public and private sectors of natural resource management; historical and legal mandates, governmentt agency responsibilities, applied methods and techniques, case studies, and practical experience. Three lec and three hrs of lab a wk; field trip may be reqd.

ResRc **487 Introduction to Field Environmental Education** (2 cr). Alt/yrs. Design and admin of environmental education programs for natural resource oriented organizations, camps, and programs such as Youth Conservation Corps; cooperation between resource specialists and educators stressed.

ResRc **488 Interpretive Methods Lab** (3 cr). Development and application of interpretive materials and techniques; concentration on equipment and methods commonly used by natural resource agencies for communicating management program and interpreting natural environments to visitors. One 3-day field trip. Prereq: ResRc 387 or perm.

ResRc **489 Personalities and Philosophies in Conservation** (2 cr). Same as WLF 489. Lives and thinking of people who have significantly influenced conservation practice or issues surrounding it.

ResRc **490 Wilderness Management** (3 cr). Alt/yrs. Historical and legal aspects of the wilderness concept; conceptual and applied approaches, considering both ecological and sociological elements; recent research.

ResRc **J491/J591 Theories of Recreation Behavior** (2-3 cr). Same as Soc J491/J591. Appl of social science perspectives to the analysis of recreation behavior in wildland environments; pertinent social and social-psychological frameworks. Additional projects/assignments reqd for grad cr.

ResRc **492 International Land Preservation Systems** (3 cr). Alt/yrs. Growth and scope of international land preservation systems from early to recent times; worldwide application of concepts of national parks, nature reserves, wilderness reserves, nature sanctuaries, biosphere reserves, refuges, and other protective designations.

ResRc **496 Monitoring Human Impacts in Wilderness** (3 cr). Alt/yrs. Theoretical and applied concepts of identifying, measuring, and monitoring changes in wilderness ecosystems caused by human influences, including recreation use, management practices, and both on-site and off-site development. Field trips may be reqd.

ResRc **498 International Issues in Nature Conservation** (1-3 cr, max 3). Alt/yrs. World approaches and problems. Prereq: sr standing and perm.

ResRc **499** (s) **Directed Study** (cr arr). For the individual student; conferences, library, field, or lab work. Prereq: sr standing, GPA 2.5, and perm.

ResRc **500 Master's Research and Thesis** (cr arr).

ResRc **501** (s) **Seminar** (cr arr). Major philosophy, management, and research problems of wildlands; presentation of individual studies on assigned topics. Prereq: perm.

ResRc **502** (s) **Directed Study** (cr arr). Prereq: perm.

ResRc **503** (s) **Workshop** (cr arr). Selected topics in the conservation and management of natural resources. Prereq: perm.

ResRc **504** (s) **Special Topics** (cr arr).

ResRc **506 Fundamentals of Research** (3 cr) (ResRc 505). Research approaches, designs, and methods as applied in natural resources, leisure, and tourism professions. Prereq: basic statistics.

ResRc **583 Natural Resource Tourism** (2-3 cr). See ResRc J383/J583.

ResRc **586 Social Ecology of Natural Resources** (3 cr). Social theory and methods relevant to resource management; interdisciplinary examination of specific natural resource issues such as fire mgt, wilderness, fisheries disputes, energy policy; emphasis on understanding social aspects of natural resources within an ecological perspective.

ResRc **587 Advanced Wildland Recreation Management** (3 cr). Advanced readings in research literature of problems, practices, and theory of recreational use and management of wildlands. Two days of field trips.

ResRc **591 Theories of Recreation Behavior** (2-3 cr). See ResRc J491/J591.

ResRc **595** (s) **Problems in World Resources** (1-3 cr, max 3). Prereq: ResRc 498 or equiv.

ResRc **597** (s) **Practicum** (cr arr). Prereq: perm.

ResRc **598** (s) **Internship** (cr arr). Prereq: perm.

ResRc **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

ResRc **600 Doctoral Research and Dissertation** (cr arr). Prereq: admission to the doctoral program in "forestry, wildlife and range sciences" and perm of dept.

Curricular Requirements

RESOURCE RECREATION AND TOURISM (B.S.Res.Rc.)

A total of 136 credits is required for the degree. This includes the university requirements (see regulation J-3), and the course work listed below. Students must select any academic minor (including those in the Department of Resource Recreation and Tourism) or a list of at least 12 credits of electives approved in advance by the adviser to complete credit requirements.

First and Second Years	**Credits**
ResRc 102 Introduction to Recreational Professions	1
ResRc 287 Principles of Wildland Recreation Management	2
ResRc 302 Wildland Recreation Field Studies	3
ResRc 310, 311 Leisure Services Research & Evaluation & Lab	4
ResRc 384 Recreation Operations & Facilities Management	2
Biol 201 Introduction to the Life Sciences	4
Biol 203 General Botany	4
Bot 241 Systematic Botany	3
Chem 103 Introduction to Chemistry	4
CommG 131 Fundamentals of Public Speaking	2
CS 102 Programming & Problem Solving for Scientists or 105 FORTRAN Programming for Engineers or 112 Introduction to Problem Solving & Programming	2-3
ForPr 230 Forest Land Measurements	2
For 221 Forest Ecology	3
For 275 Aerial Photo Interpretation	2
FWR 101 Forestry Orientation	1
Geol 101, 102 Physical Geology & Lab	4
Math 180 Analytic Geom & Calculus I or 160 Survey of Calculus	4
Psych 100 Introduction to Psychology	3
Rec 260 Leisure & Society	3
Soc 110 Intro to Sociology or ResRc 235 Soc of Natural Resources	2-3
Stat 251 Principles of Statistics or 301 Probability & Statistics	3
Electives or courses in minor	7-8
Forestry Summer Camp or Alternative Course Work	
For 301 Wildland Ecology or Biol 331 General Ecology and one of the following Fish 413 Fish Ecology For 370 Principles of Forest Management Range 351 Elements of Range Management WLF 314 Wildlife Ecology	4-6
Third and Fourth Years	
ResRc 383 Natural Resource Tourism	2
ResRc 385 Resource Recreation & Tourism Management	3
ResRc 386 Resource Recreation & Tourism Planning	3
ResRc 387 Environmental Interpretive Methods	3
ResRc 397 Renewable Natural Resources Internship	1-3
ResRc 489 Personalities & Philosophies in Conservation	2
CommG 332 Communication & the Small Group	3
Econ 272 Foundations of Econ Analysis or 151, 152 Principles of Econ	4-6
Eng 317 Technical & Engineering Report Writing	3
For 383 Economics for Natural Resource Managers	3
For 484 Forest Policy & Administration	2
WLF 390 Principles of Fish & Wildlife Ecology	3
Upper-division course in sociology or psychology	3
Approved electives or courses in minor to total 136 cr for the degree	12-18

Academic Minor Requirements

NATURAL RESOURCE COMMUNICATION MINOR

Course	**Credits**
Comm 121 News Writing	3
ResRc 387 Environmental Interpretive Methods	3
ResRc 486 Public Involvement in Natural Resource Management	3
ResRc 487 Introduction to Field Environmental Education	2
ResRc 488 Interpretive Methods Lab	3
An elective in public relations	3
At least one course from the following CommG 347 Persuasion Comm 265 Advertising & Society Comm 271 Basics of TV Production Comm 278 Introduction to Radio/TV Production Comm 281 Understanding Photography Comm 360 Broadcast Media Advertising Comm 362 Print Media Advertising Comm 425 Feature Article Writing	3

OUTDOOR RECREATION LEADERSHIP MINOR

Course	**Credits**
ResRc 287 Principles of Wildland Recreation Management	2
ResRc 387 Environmental Interpretive Methods or 488 Interpretive Methods Lab	3
ResRc 397 Renewable Natural Resources Internship	

or Rec 280 Recreation Practicum	1-3
ResRc 490 Wilderness Management or 487 Introduction to Field Environmental Education	2-3
Rec 320 Outdoor Recreation Leadership	3
Rec 321 Wilderness Medicine & Evacuation	1
Rec 420 Experiential Education	2
Courses selected from the following	7
Rec 220 Rock Climbing	
Rec 221 Mountaineering	
Rec 222 Cross Country Skiing	
Rec 223 Winter Camping	
Rec 224 Whitewater Rafting	
Rec 225 Kayaking	
Rec 255 Backpacking & Camping Skills	
Rec 270 Big Game Hunting Techniques & Safety	
One of the following courses	1-2
Rec 498 Practicum in Tutoring (1 cr)	
ResRc 401 Practicum in Tutoring (1-2 cr)	

TOURISM AND LEISURE ENTERPRISES MINOR

Course	Credits
Bus 321 Marketing	3
ResRc/Rec 181 Introduction to Hospitality Services Industries	3
ResRc 236/Rec 235 Principles of Tourism	3
ResRc 381/Rec 382 Hospitality Management & Organization	3
ResRc 397/Rec 280 Practicum/Internship	2
ResRc/Rec 400 Seminar	1
ResRc 383 Natural Resource Tourism	3
Rec 340 Leisure & Tourism Enterprises	3
One course selected from the following	3
Bus 420 Promotional Strategy	
Geog 447 Recreation & Tourism	
Rec 486 Recreation Program Planning & Marketing	
ResRc 386 Resource Recreation & Tourism Planning	

WILDERNESS AND NATURE CONSERVATION MINOR

Course	Credits
For 205 Wildland Resource Conservation	3
For 206 Wildland Resource Conservation Lab or (for majors) 301 Wildland Ecology	1 or 4
ResRc 489 Personalities & Philosophies in Conservation	2
ResRc 490 Wilderness Management	3
ResRc 492 International Land Preservation Systems	3
ResRc 496 Monitoring Human Impacts in Wilderness	3
ResRc 498 International Issues in Nature Conservation	3

SOCIAL WORK—see Department of Sociology and Anthropology

Department of Sociology and Anthropology

Richard W. Beeson, Dept. Head (101 Phinney Hall).

Anthropology Faculty: Frank C. Leonhardy, Roderick Sprague, Donald E. Tyler.

Criminal Justice Faculty: Richard W. Beeson, Raymond L. Miller.

Sociology Faculty: Richard W. Beeson, Eric L. Jensen, Marie L. Lassey, Robert G. Martin, Hilary N. Weaver. Adjunct Faculty: John E. Carlson.

Sociology and anthropology are the two social sciences that seek to understand and explain the shared behavior of people in organized groups or societies. Sociology is largely concerned with the study of western civilization as a system, particularly as regards a description of American society and how it operates today. Social work courses in the department deal with the application of social and behavioral sciences. Anthropology is concerned with the study of humanity as a part of the natural world, and of culture that developed to cope with that world. Anthropologists have dealt largely with prehistoric and primitive or simple societies and cultures in an effort to arrive at an understanding of universal cultural laws. Increasingly, anthropologists are applying basic concepts to the study of modern, complex societies.

Majors in this department take courses in both fields and are encouraged to take courses in the other social sciences (economics, cultural geography, political science, and psychology) and in the humanities (history, philosophy, and the arts) as well.

The department offers the B.A. and B.S. degrees in anthropology, criminal justice, and sociology. Sociology majors may choose a social work emphasis. Artifact collections, laboratories, and other facilities are conveniently available to anthropology majors. Graduates of the department can consider a wide range of employment possibilities, about which information can be obtained from the faculty.

While intending to embrace the fields of sociology and anthropology in their entirety, the department has major strengths in particular areas. Students are encouraged to seek these out in consultation with the faculty. This is especially important for graduate students wishing to pursue the M.A. degree, about which more information will be found in the Graduate Bulletin. Questions concerning courses and degree programs should be addressed to the department head, Archie Phinney Hall, Room 101 (208/885-6751).

Courses

ANTHROPOLOGY

PREREQUISITE: Ordinarily three credits in lower-division courses in anthropology are required for registration in upper-division courses in this field, Anthr 301 excepted; other exceptions by permission.

Anthr **100 Intro to Anthropology** (3 cr). Satisfies core requirement J-3-d. Basic theories, methods, and findings of human paleontology, prehistory, and culture.

Anthr **130 Introduction to Archaeology** (3 cr) (C). Archaeological techniques for interpreting past lifeways from material remains; includes both prehistoric and historical archaeology.

Anthr **200** (s) **Seminar** (cr arr). Prereq: perm.

Anthr **203** (s) **Workshop** (cr arr). Prereq: perm.

Anthr **204** (s) **Special Topics** (cr arr).

Anthr **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Anthr **213 Introductory Social Theory** (3 cr). See Soc 213.

Anthr **220 Peoples of the World** (3 cr). Societies of Eurasia, Africa, Americas, Australia, and islands of the Pacific.

Anthr **230 World Prehistory** (3 cr) (C). Prehistoric cultures of Old and New Worlds; techniques of excavation; methods of archaeological analysis.

Anthr **251 Introduction to Physical Anthropology** (3 cr). Evidence for primate and human evolution; processes of racial diversification; techniques of physical anthropology; human population biology.

Anthr **299** (s) **Directed Study** (cr arr). Prereq: perm.

Anthr **301 Study of Man** (3 cr) (C). Not open for cr to majors in the Dept of Soc/Anthro or to students who have taken Anthr 100 or equiv. Nontechnical intro to anthropology. Three 1-day field trips.

Anthr **322 Racial and Ethnic Relations** (3 cr). See Soc 322.

Anthr **323 Introduction to Museology** (3 cr) (C). Theory and practice of science, history, and art museums. One 1-day and two 1/2-day field trips.

Anthr **324 Comparative Family Systems** (3 cr). See Soc 324.

Anthr **325 Indians of Idaho** (3 cr). Aboriginal American Indian societies of northwestern North America; emphasis on Idaho.

Anthr **326 Anthropology of China** (3 cr). Overview of physical anthropology, archaeology, and linguistics of China with special emphasis on social anthropology of both pre- and post-liberation China.

Anthr **327 Belief Systems** (3 cr) (C). Method and theory of comparative anthropological study of religion.

Anthr **328 Anthropology of Japan** (3 cr). Survey of Japanese culture with emphasis on historical development, social organization, and belief systems.

Anthr **ID&WS329 North American Indians** (3 cr) (C). WSU Anth 331. Origins, physical types, languages, and cultures of North American Indians.

Anthr **332 Ancient Civilization** (3 cr). Literature, philosophy, science, and society in ancient Mesopotamia and ancient Egypt.

Anthr **400** (s) **Seminar** (cr arr). Prereq: perm.

Anthr **403** (s) **Workshop** (cr arr). Prereq: perm.

Anthr **404** (s) **Special Topics** (cr arr).

Anthr **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Anthr **409 Anthropological Field Methods** (1-8 cr, max 8). Field training in archaeology and/or social anthropology.

Anthr **ID&WS-J411/ID&WS-J511 Human Evolution** (3 cr). Human origins in light of the fossil record and evolutionary theory. Additional projects/assignments reqd for grad cr. Prereq: Anthr 100 or perm.

Anthr **ID&WS-J412/ID&WS-J512 Human Races** (3 cr). Human population biology, dynamics of evolution, human ecology, and their relationship to problem of human racial variation. Additional projects/assignments reqd for grad cr. Prereq: Anthr 100 or perm.

Anthr **J414/J514 Modern Social Theory** (3 cr). See Soc J414/J514.

Anthr **C419 Museum Administration** (3 cr). Administration of the total museum program. Prereq: Anthr 323.

Anthr **420 Ethnological Issues** (3 cr, max 9). Theoretical debates as presented in the classical anthropological literature. Prereq: upper-division standing.

Anthr **ID&WS-J422/ID&WS-J522 Northwest Ethnography** (3 cr). WSU Anth 428/528. Readings in standing ethnographic literature of native peoples of Pacific Northwest. Additional projects/assignments reqd for grad cr.

Anthr **ID&WS425 Contemporary North American Indian** (3 cr). WSU Anth 320. Current state of American Indian societies.

Anthr **J428/J528 Social and Political Organization** (3 cr). Bases of social and political organization; kin based units; non-kin units; political units through primitive states. Additional projects/assignments reqd for grad cr. Prereq: upper-div standing.

Anthr **J431/ID-J531 Historical Archaeology** (3 cr). WSU Anth and Hist 545. Excavation and analysis of historic archaeological sites. Additional projects/assignments reqd for grad cr. Three 1-day field trips. Prereq: perm.

Anthr **WS435 Cultural Resource Management** (3 cr). WSU Anth 435.

Anthr **J436/J536 North American Prehistory** (3 cr) (Anthr 335). Theories, methods, and findings of prehistoric North American archaeology. Additional projects/assignments reqd for grad cr.

Anthr **441 Introduction to the Study of Language** (3 cr). Same as Eng 441.

Anthr **WS-J450/WS-J550 Descriptive Linguistics** (3 cr). WSU Anth 450/550.

Anthr **J451/J551 Forensic Anthropology** (3 cr). Observations and measurements of the human skeleton; variations based on age, sex, and race, and pathologies; identification of human skeletal material and other mammals. Additional projects/assignments reqd for grad cr. Three lec/lab sessions a wk. Prereq: Anthr 251.

Anthr **497** (s) **Practicum** (cr arr).

Anthr **498 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

Anthr **499** (s) **Directed Study** (cr arr). Prereq: perm.

Anthr **500 Master's Research and Thesis** (cr arr).

Anthr **501** (s) **Seminar** (cr arr). Prereq: perm.

Anthr **502** (s) **Directed Study** (cr arr). Prereq: perm.

Anthr **503** (s) **Workshop** (cr arr). Prereq: perm.

Anthr **504** (s) **Special Topics** (cr arr).

Anthr **506** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Anthr **509 Anthropological Field Methods** (1-8 cr, max 8). Individual field work in approved areas. Prereq: perm.

Anthr **ID&WS511 Human Evolution** (3 cr). See Anthr J411/J511.

Anthr **ID&WS512 Human Races** (3 cr). See Anthr J412/J512.

Anthr **514 Modern Social Theory** (3 cr). See Soc J414/J514.

Anthr **522 Northwest Ethnography** (3 cr). See Anthr J422/J522.

Anthr **528 Social and Political Organization** (3 cr). See Anthr J428/J528.

Anthr **WS529 Seminar in Public History** (3 cr). WSU Hist 528.

Anthr **ID531 Historical Archaeology** (3 cr). See Anthr J431/ID-J531.

Anthr **536 North American Prehistory** (3 cr). See Anthr J436/J536.

Anthr **WS550 Descriptive Linguistics** (3 cr). See Anthr WS-J450/WS-J550.

Anthr **551 Forensic Anthropology** (3 cr). See Anthr J451/J551.

Anthr **WS573 Identification of Faunal Remains** (4 cr). WSU Anth 573.

Anthr **597** (s) **Practicum** (cr arr). Prereq: perm.

Anthr **598** (s) **Internship** (cr arr). Prereq: perm.

Anthr **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

CRIMINAL JUSTICE

CJ **ID&WS101 Introduction to Criminal Justice** (3 cr). WSU Crm J 101. Survey of criminal justice organizations and procedures including history and function of law enforcement, probation, and parole agencies.

CJ **200** (s) **Seminar** (cr arr).

CJ **204** (s) **Special Topics** (cr arr).

CJ **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

CJ **ID210 Criminal Investigation** (3 cr). WSU Crm J 210.

CJ **299** (s) **Directed Study** (cr arr).

CJ **320 Police Community Relations** (3 cr). Prereq: CJ 101, 210.

CJ **ID325 Criminal Law** (3 cr). WSU Crm J 320. Sources and purpose of criminal law, meaning of criminal responsibility, and elements of crime; taught by College of Law faculty members.

CJ **332 Corrections** (3 cr). See Soc 332.

CJ **WS330 Strategies of Crime Control** (3 cr). WSU Crm J 330.

CJ **400** (s) **Seminar** (cr arr).

CJ **ID&WS401 Administration of the Criminal Justice System** (3 cr). WSU Crm J 400. Criminal justice issues and their processes in the context of social, political, and economic environments.

CJ **402 Philosophers' and Humanists' Impact on the Criminal Justice System** (3 cr). Criminal justice theory from Plato to modern thinkers. Prereq: CJ 320.

CJ **404** (s) **Special Topics** (cr arr).

CJ **WS405 Comparative Criminal Justice Systems** (3 cr). WSU Crm J 405. Cr not granted for both CJ 405 and 505.

CJ **WS420 Law of Evidence and Criminal Procedure** (3 cr). WSU Crm J 420.

CJ **WS465 Juvenile Justice and Corrections** (3 cr). WSU Crm J 465.

CJ **WS470 The Police and Society** (3 cr). WSU Crm J 470.

CJ **495 Criminal Justice Practicum** (3-6 cr, max 6). Open only to criminal justice majors and minors. Supervised field experience in local or regional professional criminal justice agencies. Graded P/F, except that 3 cr may be assigned letter grades if approved by the program director.

CJ **498 Internship in Criminal Justice** (1-6 cr, max 6). Directed internship in designated criminal justice agency or institution. Graded P/F. Prereq: perm.

CJ **499** (s) **Directed Study** (cr arr).

CJ **WS505 Comparative Criminal Justice Systems** (3 cr). WSU Crm J 505.

CJ **WS530 Criminal Justice: Process and Institutions** (3 cr). WSU Crm J 530.

CJ **WS535 Planned Change in Criminal Justice** (3 cr). WSU Crm J 550.

CJ **WS540 Seminar in Criminal Justice Research Evaluation** (3 cr). WSU Crm J 540.

CJ **WS570 The Police and Society** (3 cr). WSU Crm J 570.

CJ **WS591 Seminar in Administration of Criminal Justice** (3 cr). WSU Crm J 591.

SOCIAL WORK

SW **ID&WS140 Introduction to Social Services** (3 cr) (C). WSU S W 190. Survey of the field of social welfare, contemporary social services, and the social work profession. One field trip.

SW **201 Rural Social Work** (3 cr). Exploration of special issues in human services and problems confronted by social work practitioners in a rural environment.

SW **204** (s) **Special Topics** (cr arr).

SW **320 Social Work with Substance Abuse and Alcoholism** (3 cr). Examination of substance abuse and alcoholism including current theories, diagnosis, and social work intervention with chemically dependent people.

SW **ID&WS330 Geriatric Social Work** (3 cr). WSU S W 396. Overview of social work services and policies affecting older people.

SW **ID340 Social Welfare Policy** (3 cr). WSU S W 340. Historical analysis of social issues and policies that have led to current social welfare practices. Prereq: SW 140, Soc 110 and 230.

SW **ID&WS342 Child Welfare** (3 cr). WSU S W 395. Analysis of social policies affecting children; laws, programs, and services in child welfare. One field trip. Prereq: SW 140 or 340 and Psych 305 or HEc 234.

SW **345 Human Behavior in the Social Environment** (3 cr). Analysis of the social systems model and how it applies to social work practice with individuals, families, groups, organizations, and communities.

SW **ID355 Cross-Cultural Factors in Social Work** (3 cr). WSU S W 354. Exploration of social work intervention as it applies to various cultural and ethnic groups.

SW **365 Group Social Work** (3 cr). Social work processes for working with groups and dynamics of group behavior. Prereq: SW 440 or perm.

SW **WS393 Community Organization I: Political Process** (3 cr). WSU S W 393.

SW **WS394 Community Organization II: Creative Process** (3 cr). WSU S W 394.

SW **409 Field Practicum in Social Work** (6-15 cr, max 15). Supervised field training in social work methods. Prereq: perm.

SW **440 Methods of Social Work** (3 cr). The profession of social work; basic knowledge, values, and skills necessary for working with individuals, families, groups, and communities. Prereq: SW 140 or perm.

SW **WS495 Social Work in Corrections** (3 cr). WSU S W 495.

SOCIOLOGY

PREREQUISITE: Ordinarily three credits in lower-division courses in sociology are required for registration in upper-division courses in this field; exceptions by permission.

Soc **110 Introduction to Sociology** (3 cr) (C). Satisfies core requirement J-3-d. Basic theories, concepts, and processes involved in scientific study of society; includes socialization process, social inequality, the family, religion, deviance, population, the environment, and social change.

Soc **200** (s) **Seminar** (cr arr). Prereq: perm.

Soc **203** (s) **Workshop** (cr arr). Prereq: perm.

Soc **204** (s) **Special Topics** (cr arr).

Soc **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Soc **213 Introductory Social Theory** (3 cr). Same as Anthr 213. Elements of scientific explanation and structure of theory in social science; theoretical schools in sociology and anthropology; use of midrange theory in practical research.

Soc **220 Marriage and the Family** (3 cr). Intro to basic components and principles of marriage and the family including status of these institutions in American life.

Soc **230 Social Problems** (3 cr) (C). Contemporary social issues and personal deviations; crime and delinquency, poverty and wealth, drugs, sexual variations, racism, sexism, and the environment.

Soc **235 Sociology of Natural Resources** (2 cr). See For 235.

Soc **299** (s) **Directed Study** (cr arr). Prereq: perm.

Soc **310 Rural Sociology** (3 cr) (C). Exploration of contemporary issues and trends as they relate to rural America; includes interaction of sociological, economic, and demographic factors with environmental issues. Two 1-day field trips.

Soc **311 Urban Sociology** (3 cr). Population, spatial, social patterns characteristic of urban communities. One 1-day field trip.

Soc **312 Sociology of Organizations** (3 cr). Analysis of positions, roles, norms, and authority structures in organizations.

Soc **313 Collective Behavior** (3 cr) (C). Analysis of such episodes of behavior as riots, demonstrations, panics, hysteria, as well as interaction of sociological, political, and communication processes involved in public acceptance of fashion, fads, and ideology in a mass society.

Soc **320 Sociology of Substance Abuse** (3 cr). Sociological-psychological analysis of etiology, epidemiology, prevention, and treatment of substance abuse in U.S.; major focus on family issues (including marital relationships, co-dependency) and lifestyle changes; dynamics of social change, subcultures, and symbolic functions attached to drug abuse; issues related to gender, occupational functioning, AIDS, and other topics.

Soc **321 The Community** (3 cr). Origins, types, patterns, and processes of the community. Two 1-day field trips.

Soc **322 Racial and Ethnic Relations** (3 cr). Same as Anthr 322. Theories of race relations, historical and contemporary experiences of minority groups in U.S.

Soc **323 Social Stratification** (3 cr). Major dimensions of status and power in modern society with emphasis on the American social class structure.

Soc **324 Comparative Family Systems** (3 cr). Same as Anthr 324. Cultural and evolutionary basis of family institutions utilizing current comparative research and theory.

Soc **330 Juvenile Delinquency** (3 cr) (C). Extent, causes, and control of juvenile delinquent behavior.

Soc **331 Criminology** (3 cr). Extent, criminal patterns, causes, correctional institutions, alternatives to incarceration. One 1-day field trip.

Soc **332 Corrections** (3 cr). Same as CJ 332. History, facilities, processes, and strategies for correction and punishment of offenders; analysis of concepts of prevention and control of crime.

Soc **360 Population Dynamics and Distribution** (3 cr). See Geog 360.

Soc **400** (s) **Seminar** (cr arr). Prereq: perm.

Soc **403** (s) **Workshop** (cr arr). Prereq: perm.

Soc **404** (s) **Special Topics** (cr arr).

Soc **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

Soc **409 Field Methods in Sociology** (3-15 cr, max 15). Supervised field training in sociological research methods. Prereq: perm.

Soc **410 Introduction to Social Research** (3 cr). Principal methods of data collection, analysis, and interpretation. Prereq: Stat 251 or comparable introductory statistics.

Soc **412 Society and Personality** (3 cr). Development of self concept from social interaction; how perception, learning, thinking, motivation, and attitude formation relate to social structure. Prereq: upper-division status and Soc 110 or equivalent.

Soc **J414/J514 Modern Social Theory** (3 cr). Same as Anthr J414/J514. Modern sociological and anthropological theory primarily from a conceptual and systemic perspective; incl functionalism, symbolic interactionism, structuralism, exchange conflict, and sociobiological theories. Additional projects/assignments reqd for grad cr.

Soc **J430/J530 Deviance** (3 cr). Analysis and critique of theories of deviant behavior as applied to delinquency, prostitution, chem dependencies, mental disorders, etc. Additional projects/assignments reqd for grad cr. Prereq: Soc 330 or 331 or perm.

Soc **431 Personal and Social Issues in Aging** (3 cr). Social, psychological, and physical impacts of aging on the individual and on society.

Soc **432 Juvenile Corrections** (3 cr). Seminar dealing with issues in juvenile corrections, incl deinstitutionalization, diversion, and community based programs. Two field trips. Prereq: Soc 330 or 331 and/or perm.

Soc **J433/J533 History of Indian-White Relations** (3 cr). See Hist J431/J531.

Soc **434 Family Violence** (3 cr). Explanations, patterns, and treatment of spouse abuse, child abuse, sexual exploitation of family members, and elder abuse.

Soc **443 Medical Sociology** (3 cr). Social and organizational characteristics and dynamics of health care system; social roles, social status, and interpersonal relationships of patients and various health care professionals incl physicians and nurses.

Soc **J491/J591 Theories of Recreation Behavior** (2-3 cr). Same as ResRc J491/J591. Application of social science perspectives to the analysis of recreation behavior in wildland environments; pertinent social and social-psychological frameworks. Additional projects/assignments reqd for grad cr.

Soc **495 Internship** (1-6 cr, max 6). Supervised professional field experience in human service organizations. Graded P/F. Prereq: perm.

Soc **498 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

Soc **499** (s) **Directed Study** (cr arr). Intended to accommodate a wide variety of sociological topics. Prereq: perm.

Soc **501** (s) **Seminar** (cr arr). Subjects normally offered: sociological research, social problems, and social theory. Prereq: perm.

Soc **502** (s) **Directed Study** (cr arr). Subjects normally offered: sociological theory, human ecology, and race relations. Prereq: perm.

Soc **504** (s) **Special Topics** (cr arr).

Soc **507** (s) **Research Methodology** (3 cr). See AgEc 507.

Soc **512 Sociology of Organizations** (3 cr, max 9). Sociological analysis of bureaucracies and other organizations; topics include authority, comm, informal networks, leadership, legitimacy, medical, and rural.

Soc **514 Modern Social Theory** (3 cr). See Soc J414/J514.

Soc **530 Deviance** (3 cr). See Soc J430/J530.

Soc **531 Aging and Retirement** (3 cr). Analysis of social-psych theories of aging, retirement, and leisure.

Soc **533 History of Indian-White Relations** (3 cr). See Hist J431/J531.

Soc **536 White Collar Crime** (3 cr). See Soc J436/J536.

Soc **591 Theories of Recreation Behavior** (2-3 cr). See Soc J491/J591.

Curricular Requirements

ANTHROPOLOGY (B.A. or B.S.)

Required course work includes the university requirements (see regulation J-3), the general requirements for either the B.A. or B.S. degree, and:

Course	Credits
Anthr 100 Introduction to Anthropology	3
Anthr 213 Introductory Social Theory	3
Anthr 220 Peoples of the World	3
Anthr 230 World Prehistory	3
Anthr 251 Introduction to Physical Anthropology	3
Anthr 414 Modern Social Theory	3
Anthr 420 Ethnological Issues	3
Anthr 428 Social & Political Organization	3
Anthr 441 Introduction to Study of Language	3
Soc 110 Introduction to Sociology	3
Soc 410 Introduction to Social Research	3
Stat 251 Principles of Statistics	3
Anthropology electives (upper-division)	9
Related fields as approved by the department	15

CRIMINAL JUSTICE (B.S.)

Required course work includes the university requirements (see regulation J-3), the general requirements for the B.S. degree, and:

Course	Credits
CJ 101 Introduction to Criminal Justice	3
CJ 210 Criminal Investigation	3
CJ 320 Police Community Relations or 470 Police & Society	3
CJ 325 Criminal Law	3
CJ 332 Corrections	3
CJ 401 Admin of the Criminal Justice System or 400 Seminar: Issues in Admin of Criminal Justice	3
CJ 402 Philosophers' & Humanists' Impact on CJ System	3
CJ 495 Criminal Justice Practicum	3-6
Eng 205 Advanced Expository Writing	3
PolSc 101 Introduction to American Politics	3
Soc 110 Introduction to Sociology	3
Soc 313 Collective Behavior	3
Soc 322 Racial & Ethnic Relations or 324 Comparative Family Systems	3
Soc 330 Juvenile Delinquency or 331 Criminology	3
Soc 410 Introduction to Social Research	3
Stat 251 Principles of Statistics or Stat 150 Intro to Statistics	3
Electives chosen from the following	12
CJ 405 Comparative Criminal Justice Systems	
Anthr 451 Forensic Anthropology	
Mrtn 492 Terrorism: Threat, Reality, & Response	
Phil 410 Philosophy of Law	
PolSc 467 Constitutional Law	
PolSc 468 Civil Liberties	
PolSc 469 The Judicial Process	
Psych 311 Abnormal Psychology	
Psych 330 Human Sexuality	
Psych 422 Aggression	

ResRc 288 Law Enforcement in Natural Resource Management
Soc 220 Marriage & the Family
Soc 230 Social Problems
Soc 430 Deviance
Soc 434 Family Violence
SW 140 Introduction to Social Services

SOCIOLOGY (B.A.)

Required course work includes the university requirements (see regulation J-3), the general requirements for the B.A. degree, and the following courses (electives must be approved by the student's adviser):

Course	Credits
Soc 110 Introduction to Sociology	3
Soc 213 Introductory Social Theory	3
Soc 230 Social Problems	3
Soc 410 Introduction to Social Research	3
Soc 412 Society & Personality	3
Soc 414 Modern Social Theory	3
Anthr 100 Introduction to Anthropology	3
Stat 251 Prin of Statistics or 150 Intro to Statistics	3
Sociology electives (upper-division)	21
Related fields (the more common areas incl anthro, econ, geog, hist, political sc, and psych)	18

SOCIAL WORK EMPHASIS

UI offers an emphasis (not a degree) in social work. Sociology majors with an interest in social work may choose this emphasis, which is designed to prepare students for either a career in social services at the B.A./B.S. entry level or for graduate professional schools of social work. This emphasis meets the course requirements of the Idaho State Board of Social Work Examiners for licensing application. Nonmajors may also take social work courses after prerequisites have been met.

Course	Credits
SW 140 Introduction to Social Services	3
SW 340 Social Welfare Policy	3
SW 345 Human Behavior in the Social Environment	3
SW 409 Field Practicum in Social Work	6-15
SW 440 Methods of Social Work	3
Anthr 100 Introduction to Anthropology	3
Psych 305 Developmental Psychology	3
Psych 310 Psychology of Personality	3
Psych 311 Abnormal Psychology	3
Soc 110 Introduction to Sociology	3
Soc 230 Social Problems	3
Soc 410 Introduction to Social Research	3
Soc 414 Modern Social Theory	3
Stat 251 Prin of Statistics or 150 Intro to Statistics	3
Social work and sociology electives	15
Related fields	6

SOCIOLOGY (B.S.)

Required course work includes the university requirements (see regulation J-3), the general requirements for the B.S. degree, and the following courses (electives must be approved by the student's adviser):

Course	Credits
All requirements listed for the B.A. in sociology or social work emphasis	60-72
Math electives (excluding Math 135-136)	3-4
Two courses from the following	6
Bact 154 Principles of Microbiology	
Biol 100 Introduction to Biology	
Biol 150 Heredity & Man	
Biol 201 Introduction to the Life Sciences	
Biol 351 General Genetics	
CS 100 Introduction to Computers & Programming	
Phil 412 Philosophy of Science	
Phys 105, 106 Physics & Society & Lab	
Stat 401 Statistical Analysis (or advanced stat course)	
Zool 119 Human Anatomy & Physiology	

Academic Minor Requirements

ANTHROPOLOGY MINOR

Course	Credits
Anthr 100 Introduction to Anthropology	3
Two courses from the following	6
Anthr 220 Peoples of the World	
Anthr 230 World Prehistory	
Anthr 251 Introduction to Physical Anthropology	
Three upper-division anthro courses, incl at least one 400-level course	9

CRIMINAL JUSTICE MINOR

Course	Credits
CJ 101 Introduction to Criminal Justice	3
CJ 210 Criminal Investigation	3
CJ 320 Police Community Relations or ResRc 288 Law Enforcement in Natural Resource Management	3
CJ 325 Criminal Law	3
Soc 330 Juvenile Delinquency or 331 Criminology	3
One or more of the following to total at least 18 cr for the minor:	
CJ 401 Administration of the Criminal Justice System	
CJ 402 Philosophers' & Humanists' Impact on CJ System	
PolSc 468 Civil Liberties	
PolSc 469 Judicial Process	
Soc 313 Collective Behavior	
Soc/ResRc 235 Sociology of Natural Resources	

SOCIOLOGY MINOR

Course	Credits
Soc 110 Introduction to Sociology	3
Soc 230 Social Problems or SW 140 Intro to Social Services	3
Soc 410 Introduction to Social Research or research methods course acceptable to student's major field	3
Sociology electives (other than CJ 101 and 495; 9 cr must be in upper-division courses)	12

SOCIAL WORK MINOR

This minor is designed to fulfill the minimum requirements in social work courses (21 credits) to qualify for application for social work licensure in the state of Idaho. Other related courses in human behavior and the social environment are also required for licensure.

Course	Credits
SW 140 Introduction to Social Services	3
SW 340 Social Welfare Policy	3
SW 345 Human Behavior in the Social Environment	3
SW 409 Field Practicum in Social Work	6
SW 440 Methods of Social Work	3
Soc 110 Introduction to Sociology or 230 Social Problems	3
Soc 410 Introduction to Social Research (or equivalent)	3
Social work and soc electives to total at least 21 cr for the degree	—

SOILS—see Department of Plant, Soil, and Entomological Sciences

SPANISH—see Department of Foreign Languages and Literatures

SPECIAL EDUCATION—see Department of Counseling and Special Education

STATISTICS—see Department of Mathematics and Statistics

Division of Teacher Education

George F. Canney, Acting Div. Director (404-B Educ. Bldg.). Faculty: Terry R. Armstrong, Thomas O. Bell, George F. Canney, Jack L. Dawson, Judith Doerann, Sid Eder, Mark L. Freer, Karen P. Guilfoyle, Gwendolyn N. Kelly, Joseph T. Kelly, Elinor L. Michel, Elizabeth Mowrer-Popiel, Roger A. Norris, Carolyn M. Reeves, Lewis B. Smith, Florence A. White, Edward C. Woolums, Larry K. Wriggle.

The Division of Teacher Education offers programs in elementary and secondary education and library science at the undergraduate level.

Effective schools require teachers at the elementary and secondary levels who are skilled instructors of children and youth, and who can adapt instruction to the educational and cultural background, motivation, and individual capabilities or impairments of students. The preparation of a teacher involves substantial knowledge of instructional content and general instructional strategies, as well as special methods for teaching specific content or students with special needs.

The division provides the professional and foundational courses that meet the general requirements for initial certification in elementary and secondary teaching. Specialized course work and field experience leading to certification in elementary education and secondary education are also provided.

The undergraduate program in elementary education prepares teachers for elementary schools by providing theory and practice in instructional strategies and the acquisition of teaching competencies in reading and language arts, mathematics, science, social studies, art, and music. Professional preparation also emphasizes the study of the child and an understanding of psychological foundations. Specializations in early childhood education and special education are available within the B.S.Ed. degree program in elementary education.

The undergraduate program in secondary education prepares teachers for secondary schools by providing theory and practice in instructional strategies and the acquisition of teaching competencies in the following subjects as currently taught in secondary schools: English, social studies, sciences, mathematics, art, and foreign languages. Students also complete teaching majors or minors in the subject area(s) in which teaching certification is desired. A student in secondary education may earn either a B.S.Ed. degree through the College of Education or, alternatively, a B.A. or B.S. degree through the department and college administering the academic major.

Professional education course work is conducted in the Education Building and in the public schools. The Education Building houses preschool and kindergarten classrooms; specialized facilities for microteaching; laboratories for special methods courses in mathematics, art, social science, and natural sciences; and the Instructional Materials Center, which contains a comprehensive curriculum library as well as children's literature and special education materials.

The division provides advanced professional and foundational courses that support graduate programs in the College of Education. Advanced programs in the Division of Teacher Education are (a) the Advanced Certification (planned fifth year) programs; (b) master's degree programs (either Master of Education or Master of Science) in elementary education and secondary education, which result in an Advanced Elementary or Secondary Certificate; (c) specialist degree programs in education, with emphases in elementary education, secondary education, and supervision and instructional leadership; and (d) doctoral degree programs (either Doctor of Education or Doctor of Philosophy) with emphases in elementary education, secondary education, and supervision and instructional leadership.

Courses

RELATED AREAS: For other offerings in the field of education, see: agricultural education, art, business education, counseling, educational administration, home economics, music, physical education, special education, and vocational teacher education.

EDUCATION

PREREQUISITE: For registration in upper-division courses in education, students must have been admitted to the teacher-education program and have a GPA of 2.50, unless a higher average is stated as a prerequisite in the course description.

Ed **200** (s) **Seminar** (cr arr). Prereq: perm.

Ed **201 Introduction to Teaching** (2 cr). Interpersonal communication, human relations including multicultural concerns, discipline, classroom evaluation techniques, and use of technology. Prereq: sophomore standing; coreq: Ed 202.

Ed **202 Introduction to Teaching Laboratory** (1 cr). Intro to the "world of teaching" through classroom observation and participation. Graded P/F. Two hrs of lab a wk. Prereq: sophomore standing; prereq or coreq: Ed 201.

Ed **203** (s) **Workshop** (cr arr). Prereq: perm.

Ed **204** (s) **Special Topics** (cr arr).

Ed **273 International Education Scene** (1-9 cr, max 9). Also offered as Ed 473. Study-tour conducted by a UI faculty member to observe selected education systems and procedures in foreign countries. One cr a wk.

Ed **299** (s) **Directed Study** (cr arr). Graded P/F. Prereq: perm.

Ed **C302 The Child and Society** (3 cr). Child in the social milieu; family, social group, community, school; social pressures and conditioning upon the child and the education process.

Ed **312 Educational Psychology** (2 cr) (Ed 415). Processes of human growth, development, and learning, and the practical application of this knowledge to teaching. Prereq: Psych 100.

Ed **313 Educational Measurement** (1 cr). Application of standardized testing, measures of central tendency, variability and correlation in educational research. Three lec a wk. Coreq: Ed 312 or perm.

Ed **314 Strategies for Teaching** (2-3 cr). Problems and methods of teaching common to all subject and grade levels. Two lec and two hrs of microteaching lab a wk.

Ed **J322/J522 Early Childhood and Kindergarten Education** (2-4 cr). Historical development, theoretical and practical applications in early childhood and kindergarten education. Additional projects/assignments reqd for grad cr. Two lec and 3-6 hrs of lab a wk.

Ed **326 Elementary School Mathematics Education** (3 cr). Specific methods, research, curricula, and media in teaching elementary-school mathematics. Prereq: Math 135 and 136.

Ed **328** (s) **Audiovisual Aids** (1-3 cr, max 3). Prin and methods of AV instruction. Areas of instruction include equipment operation, display techniques, television, photography, and microcomputers for the teacher.

Ed **334 Children's Literature** (3 cr) (C). For each grade level; story plays, dramatizations, effective reading and telling children's stories, and their place in elementary school.

Ed **336 Introduction to Reading** (4 cr). Basic principles and techniques for teaching reading in the elementary school; emphasis on content, methods, and materials.

Ed **J340/J563 Methods of Teaching Content Reading** (3 cr) (Ed J440/J563). Strategies to extend reading skills in content-area textbooks and to extend writing skills related to paragraphing and essay tests in content classes. Additional projects/assignments reqd for grad cr.

Ed **375 Elementary School Art Methods** (3 cr). Techniques, materials, and processes used in teaching elementary art; relationship of art to the elementary curricula.

Ed **381 Elementary School Music Methods I** (3 cr). See MusT 381.

Ed **400** (s) **Seminar** (cr arr). Prereq: perm.

Ed **402 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm of dept.

Ed **403** (s) **Workshop** (cr arr). Prereq: perm.

Ed **404** (s) **Special Topics** (cr arr).

Ed **J405/J505** (s) **Professional Development** (cr arr). Professional development and enrichment of certificated school personnel. Cr earned will not be accepted toward grad degree programs, but may be used in a fifth-yr program. Additional projects/assignments reqd for grad cr.

Ed **406 Elementary School Team Teaching** (3 cr). Philosophy; organization; trends in building construction for team teaching; curriculum materials; role of teacher, pupils, and auxiliary personnel.

Ed **411 The Junior High School** (3 cr). Principles, organization, administration, and methods of instruction.

Ed **J416/J516** (s) **College Teaching** (1-2 cr, max 2). Techniques for effective teaching at college level. Additional projects/assignments reqd for grad cr.

Ed **418 Identifying and Correcting Mathematics Deficiencies** (3 cr). Study of teaching arithmetic including appropriate diagnostic-prescriptive strategies for correcting arithmetic deficiencies; microcomputers and calculators as instructional tools; consumer mathematics as an area of application.

Ed **419 Microcomputers in Mathematics Teaching** (1-2 cr). Review of software appropriate for teaching mathematics. Prereq: perm; coreq: mathematics methods course (unless offered independently to cover specific topics or programs).

Ed **420 Elementary School Language Arts Methods** (3 cr). Strategies for teaching oral language, listening, and composition; all topics dealing with language except reading and literature; includes clinical experience in K-6 classroom. Prereq: Ed 314 (334 recommended).

Ed **421 Elementary School Social Studies Methods** (2-3 cr). Specific methods, research, curricula, and media in teaching elementary-school social studies.

Ed **426 Organization and Administration of School Media Centers** (3 cr). Standards for media program, physical facilities, staffing, budget, media services, and in-service program.

Ed **430 Practicum: Elementary School Teaching** (7 or 14 cr). Only double program participants enroll for 7 cr. Supervised teaching in elementary schools. Graded P/F. Prereq: Ed 312, 313, 314, 326, 334, 336, 420, admission to teacher education, cumulative GPA of 2.50, and perm of dept; coreq: Ed 445. (Submit application to director of clinical experiences in teacher education by December 1 of school yr before enrolling.)

Ed **431 Practicum: Secondary School Teaching** (7 or 14 cr). Only double program participants enroll for 7 cr. Supervised teaching in secondary schools. Graded P/F. Prereq: Ed 312, 313, 314, 340, admission to teacher education, cumulative GPA of 2.50, and perm of dept; coreq: Ed 445. (Submit application to director of clinical experiences in teacher education by December 1 of school yr before enrolling.)

Ed **432 Practicum: Music Teaching** (3-9 cr, max 9). Supervised music teaching in public schools. Graded P/F. Prereq: Ed 312, 314, 445, cumulative GPA of 2.50, and perm of dept. (Submit application via coordinator of music education to the director of clinical experiences in teacher education by December 1 of school yr before enrolling.)

Ed **433 Practicum: Dance Teaching** (3-9 cr, max 9). Supervised teaching in grades 1-12; two-thirds of experience in secondary schools. Graded P/F. Prereq: Ed 314, 445, special methods in subject area, cumulative GPA of 2.50, and perm of dept. (Submit application via director of Center for Dance to the director of clinical experiences in teacher education by December 1 of school yr before enrolling.)

Ed **435 Practicum: Elementary School Teaching** (Special) (3 cr). For secondary education students majoring in art or physical education who wish to qualify for Idaho endorsement to teach these subjects at the elementary level. Graded P/F. Prereq: special methods in the subject area and cumulative GPA of 2.50. (Submit application to director of clinical experiences in teacher education by December 1 of school yr before enrolling.)

Ed **436 Reading: Alternatives to Basals** (2-3 cr). The language experience approach to reading in primary and individual reading program at intermediate grades; rationale and methods. Prereq: Ed 334 and 336.

Ed **438 Elementary School Mathematics Lab** (3 cr). Construction and solution of problems based on experiments that may be easily performed in elementary schools.

Ed **439 Comparative Education** (3 cr). Education systems in relation to the cultural backgrounds that give rise to them.

Ed **443 Teaching of Geography** (3 cr). Trends, methods, AV materials, planning the program, specialized skills and forces contributing to change in geographic education.

Ed **444 Elementary School Science Methods** (2-3 cr). Specific methods, research, curricula and media in teaching elementary-school science.

Ed **445 Proseminar in Teaching** (3 cr). Orientation to practicum, career placement, and entry-level teaching. Coreq: enrollment in senior practicum.

Ed **448 Production and Use of Media in Education** (3 cr). Production, use, and organization of media in the student's field of interest. Prereq: experience in teaching.

Ed **468 Historical and Philosophical Foundations of Education** (3 cr). Events, leaders, ideas, and movements underlying development of education.

Ed **473 International Education Scene** (1-9 cr, max 9). See Ed 273.

Ed **474 Secondary School Foreign Language Methods** (2 cr) (Ed 341). Alt/yrs. Specific methods, research, curricula, and media in teaching secondary school foreign language. Prereq: Ed 312, 313, 314, 340, or perm.

Ed **475 Secondary School English Methods** (3 cr) (Ed 315). Specific methods, research, curricula, and media in teaching secondary school English. Enrollment limited to 18 per section. Prereq: Ed 312, 313, 314, 340, Eng 401, 441.

Ed **476 Secondary School Social Studies Methods** (2 cr) (Ed 316). Specific methods, research, curricula, and media in teaching secondary school social studies. Prereq: Ed 312, 313, 314, 340, or perm.

Ed **477 Secondary School Science Methods** (2 cr) (Ed 317). Specific methods, research, curricula, and media in teaching secondary school science. Prereq: Ed 312, 313, 314, 340, or perm.

Ed **478 Secondary School Mathematics Methods** (2 cr) (Ed 318). Specific methods, research, curricula, and media in teaching secondary school mathematics. Prereq: Ed 312, 313, 314, 340, or perm.

Ed **479 Secondary School Art Methods** (2 cr) (Ed 319). Alt/yrs. Specific methods, research, curricula, and media in teaching secondary-school art. Prereq: Ed 340 or perm.

Ed **499** (s) **Directed Study** (cr arr). Graded P/F. Prereq: perm.

Ed **500 Master's Research and Thesis** (cr arr).

Ed **501** (s) **Seminar** (cr arr). Prereq: perm.

Ed **502** (s) **Directed Study** (cr arr). Prereq: perm.

Ed **503** (s) **Workshop** (cr arr). Prereq: perm.

Ed **504** (s) **Special Topics** (cr arr).

Ed **505** (s) **Professional Development** (cr arr). See Ed J405/J505.

Ed **507 Supervision of Instruction** (3 cr). Preparation of supervisors to aid teachers in the improvement of instruction.

Ed **510 Philosophy of Education** (3 cr). Analysis of educational objectives, concepts, and theories.

Ed **511 Planning and Administering the Curriculum** (3 cr). Processes of systematic curriculum development, decision-making roles, processes in curriculum planning, supporting admin patterns and instructional arrangements; trends, issues, strategies in subject-matter fields.

Ed **512 Program Development and Evaluation** (3 cr). Types of instructional systems, systematic educational program development; evaluation methods, issues in measurement and evaluation design.

Ed **513 History of Educational Thought** (3 cr). Writings that have influenced educational theory and practice.

Ed **514 The Logic of Teaching** (3 cr). Different kinds of statements (e.g., synthetic, analytic, and value) and different logical operations (e.g., defining, describing, evaluating, and justifying, comparing and contrasting, conditional inferring and explaining), particularly as these occur in classroom situations in a teaching context.

Ed **515 Logic of New Media** (3 cr). Technological development in education; advanced forms that influence learning, teaching, and curriculum content and organization.

Ed **516** (s) **College Teaching** (1-2 cr, max 2). See Ed J416/J516.

Ed **517 Advanced Elementary School Mathematics Education** (3 cr). Recently developed methods and materials in elementary school mathematics. Prereq: qualified for a standard elementary certificate.

Ed **520 Elementary School Science and Social Studies** (3 cr). Methods and techniques; foundations of the unit as a means of instruction. Prereq: qualified for a standard elementary certificate.

Ed **521 Advanced Language Arts** (3 cr). Research and implications of data related to modern techniques of teaching.

Ed **ID522 Early Childhood and Kindergarten Education** (2-4 cr). See Ed J322/J522.

Ed **523 Creative Arts and Creative Teaching** (3 cr). Creativity in children; art, music, socio-drama-creative writing. Prereq: qualified for a standard elementary certificate.

Ed **524 Models of Teaching** (3 cr). Examination of information processing, social interaction, personal, and behavioral models of teaching; emphasis on practical implementation of these models in teaching situations.

Ed **525 Problems in Secondary Social Studies** (3 cr). Recent research and interpretation in social studies content, methods, and materials.

Ed **526 Advanced Educational Psychology** (3 cr). Selected psychological theories and their application to instruction, classroom management, reading, testing, and related educational research.

Ed **527 Instructional Theory into Practice** (3 cr). Applications of instructional theory to the areas: teaching to an objective; diagnostic and prescriptive teaching; teaching to enhance motivation; reinforcement, transfer, retention, and rate and degree of learning; enhancement of pupil self-concept; and critical decisions underlying such techniques.

Ed **530 Educational Law** (3 cr). Statutory and case materials; principles applied to all states.

Ed **531 Elementary School Mathematics Education Research** (3 cr). Classic and contemporary research; experimental studies; rationale for position of specialist; objectives; coordination of services. Prereq: perm.

Ed **538 Student Teaching Supervision** (3 cr). Nature and scope of student teaching; role of cooperating agencies; role of participants; techniques; planning; evaluation.

Ed **551 Children's Literature and the Curriculum** (3 cr). How all phases of literature fit into and become a part of the curriculum; developing various areas of the curriculum based on literature; evaluation of literature, authors, and illustrators.

Ed **560 Research and Writing** (3 cr). Techniques of research in education.

Ed **561 Issues in Reading** (3 cr). Current issues in reading and their impact on classroom instructional practice. Prereq: Ed 336 and perm.

Ed **562 Advanced Reading Tech** (3 cr). Consideration of the research basis for current instructional practices in reading and development of more effective techniques for teaching reading. Prereq: Ed 336 or perm.

Ed **563 Methods of Teaching Content Reading** (3 cr). See Ed J340/J563.

Ed **565 Psycholinguistics and Reading** (3 cr). Contributions of psychology and linguistics, readings, disc, and activities to broaden the instructional base.

Ed **566 Corrective Reading** (3 cr). Nature, causes, and diagnosis of moderate reading difficulties; translation of diagnostic information into instructional practice. Prereq: Ed 336, 562, or equiv.

Ed **567 Clinical Practicum in Reading** (3 cr). Exercise of diagnostic procedures and individual instructional techniques with small groups of children who have moderate reading difficulties. Prereq: Ed 566.

Ed **568 Seminar: Research in Reading** (3 cr). Examination of significant research problems in reading and the procedures used to study such problems. Prereq: doctoral standing or perm.

Ed **569 Teaching of Reading Methods** (3 cr). Examination of content, instructional methodologies, and evaluation techniques employed in teacher education in reading. Prereq: doctoral standing or perm.

Ed **572 Measurement and Evaluation** (3 cr). Improvement of testing, examination, and evaluation in schools; practice in making, giving, scoring, and interpreting tests; use of results in counseling.

Ed **581 Systematic and Objective Analysis of Instruction** (4 cr). Supervision as a change process and analysis of supervisory cycle; application of supervisory cycle in K-12 classroom situations; designed to improve individual skill in analysis of instruction and to relate theory to practice. Graded P/F. Preregistration reqd; enrollment limited to 14 per section.

Ed **585 Computer Systems for Educational Research** (3 cr). Educational applications of microcomputer and mainframe data analysis. Two lec and 2 hrs of lab a wk.

Ed **586 Planning and Design of Educational Research** (2-4 cr, max 6). Planning educational inquiry projects appropriate for Ph.D. or Ed.D. dissertation; formulation of conceptual framework relative to analytical process; inquiry design; constructs and variables; sampling; variance control; types of inquiry; measurement instrumentation; data collection and analysis. Prereq: Stat 251 or equivalent, and perm.

Ed **590 History of Education** (3 cr). Development and influence of educational ideals and practices.

Ed **597** (s) **Practicum** (cr arr). Graded P/F. Prereq: perm.

Ed **598** (s) **Internship** (cr arr). Currently offered in public school teaching and college teaching. Graded P/F. Prereq: perm.

Ed **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Ed **600 Doctoral Research and Dissertation** (cr arr).

LIBRARY SCIENCE

LibSc **299** (s) **Directed Study** (cr arr). Prereq: perm.

LibSc **400** (s) **Seminar** (cr arr). Prereq: perm.

LibSc **404** (s) **Special Topics** (cr arr).

LibSc **C419 Computer Applications in Libraries** (3 cr). Trends and developments in library automation; practical applications of microcomputers to library work and administration. Note: This is an academic course intended to teach fundamental terms and concepts. It is not a course on automating a library.

LibSc **C420 Classification and Cataloging** (4 cr). Organization of library materials, principles of cataloging, subject analysis, classification, bibliographic methods, Dewey decimal system.

LibSc **C421 Acquisitions and Collection Development in Libraries** (3 cr). Evaluation and selection of books and other materials for libraries; analysis of community library needs and interests.

LibSc **C422 Use of the School Library** (2 cr). Methods of interesting students in the library and using it to best advantage.

LibSc **C423 Introduction to Reference Work** (3 cr). Reference books in school and public libraries; selecting reference collections.

LibSc **C425 Organization and Management of Small Libraries** (4 cr). Organization and management of school libraries.

LibSc **427 Library and Media Center Practicum** (1-3 cr, max 6). Practical experience in libraries and other information centers under professional supervision. Prereq: perm of dept.

LibSc **499** (s) **Directed Study** (cr arr). Prereq: perm.

Curricular Requirements

ELEMENTARY EDUCATION (B.S.Ed.)

Required course work includes the university requirements (see regulation J-3), the general requirements for students preparing to teach at the elementary level (see College of Education section in part 4), and:

Course	Credits
Ed 326 Elementary School Mathematics Ed	3
Ed 334 Children's Literature	3
Ed 336 Introduction to Reading	4
Ed 375 Elementary School Art Methods	3
Ed 420 Elementary School Language Arts Methods	3
Ed 421 Elementary School Social Studies Methods	2
Ed 436 Reading: Alternatives to Basals	2
Ed 444 Elementary School Science Methods	2
Dan 220 Children's Dance or ThA 381 Drama in Education	2-3
MusT 381 (Ed 381) Elementary School Music Methods I	3
PE 250 Elementary Physical & Health Education	3

And completion of one of the following options:

A. One 20-credit, single-subject or composite area of concentration and one 15-credit, single-subject area of concentration.

B. One 30-credit, single-subject area of concentration. Grade point average of 2.5 required in the area.

C. One 40-credit composite area of concentration. Grade point average of 2.5 required in the area.

SECONDARY EDUCATION (B.S.Ed.)

Required course work includes the university requirements (see regulation J-3), the general requirements for students preparing to teach at the secondary level (see College of Education section in part 4), one course in special methods applicable to secondary schools (Ed 474, 475, 476, 477, 478, 479, H&S 323, or another approved special methods course), Methods of Teaching Content Reading (Ed 340), and the satisfactory completion of one of the following options selected from the list headed "Teaching Majors and Minors" in the College of Education section, part 4:

A. Two 30-credit teaching majors.

B. One 40-credit teaching major and one 20-credit teaching minor.

C. One 30-credit teaching major and two 20-credit teaching minors.

D. One 60-credit teaching major.

Department of Theatre Arts

Bruce C. Brockman, Dept. Chair (U-Hut 102). Faculty: David Banner, Bruce C. Brockman, Frederick L. Chapman, Debra Dutkiewicz-Zetterberg, Patricia Martin, Dean F. Panttaja, Forrest E. Sears.

The study of theatre encourages the development of the whole person. Through performance, students gain a deeper understanding of themselves and human behavior; through design, students learn how to manipulate space, lighting, color, and texture; through the study of drama as an educational tool, students learn how to use the elements of theatre as performance, as well as drama as process. Because theatre encompasses so many disciplines, it is an excellent way of enhancing a general education, encouraging artistic sensitivity, and teaching students to work in collaboration with fellow artists.

The theatre curriculum at UI leads to a B.A., B.S., or B.F.A. degree and provides a broad base from which students may pursue a number of different career options. All students are required to complete a core of courses ensuring general competency in all areas of theatre. Those wishing to specialize in a particular aspect of theatre are able to do so through the use of electives. The Bachelor of Fine Arts degree is offered to those students who wish to embark on professional careers in theatre. Requirements are stringent and include constant monitoring of the student's progress. The student is an integral part of the department production process, fostering a close relationship with the theatre faculty and enabling the student to experience the kind of growth that comes through working with professional artists.

In the Hartung Theatre, UI has one of the finest theatre facilities in the Northwest. The 419-seat, semithrust theatre is complemented by one of the best equipped shops, costume inventories, and lighting and sound systems in the region. Additionally, the Jean Collette Theatre, with 89 seats, is equipped with a new lighting and sound system and is the primary space in which student actors, directors, and technicians may experiment and develop their skills.

Graduate study at UI emphasizes acting, directing, design, and technical theatre. The department's size permits graduate students to take an active part in the process of theatre production. If qualified, students may be asked to assist the instructors in the teaching of basic skills to undergraduate students. The department emphasizes the creative thesis for the degree and graduate students have designed and directed major productions at the university.

Students interested in pursuing a degree in theatre and who have further questions about the program should feel free to consult the department chair (telephone 208/885-6465).

Theatre Arts Courses

ADVANCED PLACEMENT: Courses in this subject field that are vertical in content are: ThA 105-106-272-273-305-306-407-408; ThA 103-104-301-302.

ThA **100 Theatre Process and Production** (3 cr). Open only to majors. Intro to theatre with emphasis on creative processes, organizational structures, and collaborative systems inherent in production and performance of theatre events.

ThA **101 Introduction to the Theatre** (3 cr). Satisfies core requirement J-3-d. For nonmajors. Building an appreciation for theatre as an art form through understanding the creative process of the playwright, the director, the designer, and the actor. Three lec and 2 hrs of recitation a wk.

ThA **102 Theatrical Makeup** (2 cr). Creation of the make-up mask through sculpting with paint. One lec and 3 hrs of lab a wk. Limited to 20 students. Prereq: perm.

ThA **103 Introduction to Stagecrafts** (3 cr). Intro to theatre production spaces, shop tools, construction materials, and stage equipment; theories and methods used in the construction of scenery and props. Three lec and 6 hrs of lab a wk.

ThA **104 Advanced Stagecrafts** (3 cr). Continued study of stagecraft incorporating plastics, steel usage, hand and set prop construction, basic scene painting techniques, costumes, electricity and lighting equipment. Three lec and 6 hrs of lab a wk. Prereq: ThA 103 or perm.

ThA **105-106 Basics of Performance** (2 cr). Intro to performance; techniques of relaxation, observation, and justification; work in improvisation, sensory exploration, image-making, and beginning textual analysis; initial monologue and scene performance. Two labs a wk.

ThA **110 Convocation** (0 cr). One 1-hr weekly seminar.

ThA **125 Summer Theatre I** (2-4 cr, max 4). Theatre production, including public presentation of several plays. Max 10 cr in ThA 125 and 395 combined. Prereq: perm of dept.

ThA **150 Performance Lab** (1 cr, max arr). Intro to fundamentals of production and use of the human voice; intro to Berry and Linklater; intro to the Alexander technique, T'ai Chi Ch'uan, and Aikido. Two labs a wk.

ThA **190 Theatre Practice I** (1 cr, max 4). Open to nonmajors. Practical experience in all aspects.

ThA **200** (s) **Seminar** (cr arr). Prereq: perm.

ThA **203** (s) **Workshop** (cr arr). Prereq: perm.

ThA **204** (s) **Special Topics** (cr arr).

ThA **265 Children's Theatre** (3 cr). Alt/yrs. Selection, preparation, and presentation of theatre for children; story telling; recreation and special occasion programs.

ThA **271 Play Analysis** (3 cr). Critical intro to plays as drama and theatre; an approach to tragic and comic genres; major dramatists of the 20th century culminating in an analysis of contemporary theatre styles.

ThA **272 Intermediate Acting** (3 cr). Exploration of Stanislavsky System focused in work on sense and emotional memory, inner monologue, and imagery techniques; emphasis on group improvisation and theatre games; work in action and scene study; performances of selected scenes and monodramas. Prereq: ThA 105-106.

ThA **273 Intermediate Acting** (3-4 cr). Studies in American method acting as exemplified by its leading practitioners (Strasberg, Hagen, and Meisner), as well as post-modernist practices; textual analysis and individual acting problems; continuing emphasis in scene preparation. Includes one lab a wk when taken for 4 cr.

ThA **299** (s) **Directed Study** (cr arr). Prereq: perm.

ThA **301-302 Visual Theatre and Design** (3 cr). Development of basic skills in visualization, period research, theatrical graphics techniques, and script interpretation with emphasis in areas of costumes, scenery, and lighting design. Three lec and 1 hr of lab a wk. Prereq for ThA 302: 301.

ThA **305 Methods in Characterization** (3-4 cr). Alt/yrs. Developing a character through work in centers, physicalization, and emotional exploration as well as character essences based on studies in animals, paintings, costumes, music, and props. Includes one lab a wk when taken for 4 cr.

ThA **306 Advanced Acting** (3-4 cr). Alt/yrs. Theory and practice of comedy playing; exercises, improvisations, and performances in comic genres, farce through comedy of manners; intro to period comedy. Includes one lab a wk when taken for 4 cr.

ThA **350 Performance Lab** (1 cr, max arr). Further work on fundamentals of production and use of the human voice; continued exploration of Berry and the Alexander Technique; intro to basics of stage combat. Two labs a wk.

ThA **361 Technical Production** (3 cr). Technical direction and planning for single and multiple set theatre productions; includes shop and personnel management techniques, drafting, budgets, scheduling, and organization.

ThA **362 Costume Design I** (3 cr). Historical overview of costume from Greek to the 19th century; costume design and rendering emphasized.

ThA **363 Costume Construction** (3 cr). Methods of pattern drafting, fitting, and construction of theatrical costumes.

ThA **364 Scene Design I** (3 cr). Development of stage designs emphasizing basic production schemes and exploring advanced rendering and drawing techniques. Prereq: ThA 271 or perm.

ThA **373 Stage Lighting** (3 cr). Basic equipment and lighting methods for theatrical production; basic drafting and design of a realistic production.

ThA **381-382 Drama in Education** (3 cr). Rationalization and clarification of the means and purposes of drama as an educational tool in the teaching/learning process. ThA 381: theory and techniques through film, lec, and dem. ThA 382: analogy, role, mantle of the expert, simulation, movement, planning, supervised fieldwork.

ThA **390 Theatre Practice II** (1 cr, max 4). Open to nonmajors. Continuation of ThA 190. Set construction, costumes, lights, and properties.

ThA **395 Summer Theatre II** (2-8 cr, max 8). Continuation of ThA 125. Max 10 cr in ThA 125 and 395 combined. Prereq: perm of dept.

ThA **400** (s) **Seminar** (cr arr). Prereq: perm.

ThA **403** (s) **Workshop** (cr arr). Prereq: perm.

ThA **404** (s) **Special Topics** (cr arr).

ThA **405 Individual Instruction in Performance** (cr arr). Individualized coaching in performance. One hr of lab a wk per cr. Prereq: perm of dept.

ThA **406 Individual Instruction in Production** (cr arr). Individualized and research study in technical production and design. One hr of lab a wk per cr. Prereq: perm of dept.

ThA **J407/J507 Acting Shakespeare** (3-4 cr). Alt/yrs. Shakespearean texts; emphasis on interpreting and performing conventions of his prose and verse plays, as well as a study of the world view of Elizabethan England. Additional projects/assignments reqd for grad cr. Includes one lab a wk when taken for 4 cr.

ThA **J408/J508 Styles of Acting** (3-4 cr). Alt/yrs. Study and performance of acting styles based on cultural backgrounds, manners, and customs of a period; selected historical and 20th century styles; continued work in acting Shakespeare. Additional projects/assignments reqd for grad cr. Includes one lab a wk when taken for 4 cr.

ThA **J410/J510 Costume Design II** (3 cr, max 12). Emphasis on developing characterization, stylization, and fabric choice; explore advanced rendering techniques, continuation of portfolio development. Additional projects/assignments reqd for grad cr. Prereq: ThA 362 or perm.

ThA **464 Scene Design II: Evolution of Design** (3 cr). Development of a conceptual approach to design through assorted design projects. Prereq: ThA 364.

ThA **J467-J468/J567-J568 The Theatre** (3 cr). Alt/yrs. Survey of European and American theatres, dramatists, and actors from the Greeks to Ibsen. Additional projects/assignments reqd for grad cr.

ThA **J469/J569 Modern Theatre** (3 cr). History of the movements, personalities, and representative plays of the modern theatre from Ibsen, Strindberg, and Chekhov through Pirandello to 1930. Additional projects/assignments reqd for grad cr.

ThA **J470/J570 Modern Theatre** (3 cr). Alt/yrs. Epic theatre, theatre of the absurd, theatre of cruelty, contemporary trends in drama, directing, and design; seminar approach. Additional projects/assignments reqd for grad cr.

ThA **J471-J472/J571-J572 Directing** (3 cr). ThA J471/J571: preparation of a play from casting to performance. ThA J472/J572: staging and interpretation of a play; developing a production concept; coaching actors. Additional projects/assignments reqd for grad cr. Prereq: perm of dept.

ThA **480 Drama in Education Practicum** (3-9 cr, max 9). Directed process work on selected levels in local classrooms with all age groups, performance planned in conjunction with inservice teachers.

ThA **J484/J584 Advanced Stage Lighting** (3 cr). Advanced lighting design theories and practice through design of assorted productions in realistic drama, dance, arena, thrust, and mystical theatre. Additional projects/assignments reqd for grad cr. Prereq: ThA 373 or perm.

ThA **498** (s) **Internship** (cr arr). Prereq: perm.

ThA **499** (s) **Directed Study** (cr arr). Prereq: perm.

ThA **500 Master's Research and Thesis** (cr arr).

ThA **501** (s) **Seminar** (cr arr). Prereq: perm.

ThA **502** (s) **Directed Study** (cr arr). Prereq: perm.

ThA **503** (s) **Workshop** (cr arr). Prereq: perm.

ThA **504** (s) **Special Topics** (cr arr).

ThA **507 Acting Shakespeare** (3-4 cr). See ThA J407/J507.

ThA **508 Styles of Acting** (3-4 cr). See ThA J408/J508.

ThA **509 Summer Theatre III** (2-8 cr, max 8). Theatre production, including public presentation of several plays; emphasis on responsibilities of the grad student including assisting the director, serving as crewhead, and acting. Prereq: 20 cr in the theatre arts and perm of dept.

ThA **510 Costume Design II** (3 cr, max 12). See ThA J410/J510.

ThA **511 MFA Acting Studio** (3 cr, max 18). Advanced individual study in performance.

ThA **512 MFA Directing Studio** (3 cr, max 18). Advanced individual study in directing, including work in staging, styles, and interpretation.

ThA **513 MFA Design Studio** (3 cr, max 18). Advanced individual study in all areas of theatrical design with emphasis on portfolio development. One lec and 2 hrs of lab a wk.

ThA **514 MFA Production Studio** (3 cr, max 18). Advanced individual study in all areas of technical theatre production and management with emphasis on portfolio development. One lec and 2 hrs of lab a wk.

ThA **520 Advanced Directing** (3 cr). Techniques and styles of major 20th-century directors; work in directing genres of tragedy, drama, melodrama, comedy, and the absurd.

ThA **522 Directing the Period Play** (3 cr). Interpretation and staging of classical texts in major dramatic periods; social and cultural view of each period.

ThA **530 Graduate Design: Theatrical Architecture and Decor** (3 cr, max 12). Advanced design problems emphasizing research and design in various historical styles of decorative art, architecture, and furniture; continuation of portfolio development. Prereq: ThA 464 or perm.

ThA **535 Production Design** (3 cr, max 12). Design responsibility for a mainstage production. Prereq: perm of dept.

ThA **567-568 The Theatre** (3 cr). See ThA J467-J468/J567-J568.

ThA **569 Modern Theatre** (3 cr). See ThA J469/J569.

ThA **570 Modern Theatre** (3 cr). See ThA J470/J570.

ThA **571-572 Directing** (3 cr). See ThA J471-J472/J571-J572.

ThA **584 Advanced Stage Lighting** (3 cr). See ThA J484/J584.

ThA **596 MFA Exit Project** (3 cr). Culminating creative project for MFA candidates. Prereq: perm of dept.

ThA **597** (s) **Practicum** (cr arr). Prereq: perm.

ThA **598** (s) **Internship** (cr arr). Prereq: perm.

ThA **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

Curricular Requirements

THEATRE ARTS (B.F.A.)

The Bachelor of Fine Arts degree is an intense training program for students wishing to pursue a career in the processional theatre. It is divided into four specific areas of study within an area of concentration. Areas of concentration include but are not limited to: acting, technical production, and scenery, lighting, or costume design. Individual courses are chosen by the student and his or her adviser within those categories, allowing the degree to be tailored to the student's specific needs. Student progress is monitored each semester through performance juries and portfolio reviews. Students in the B.F.A. program are encouraged to take internships with professional theatre companies in the region as part of their program of study.

Required course work includes the university requirements (see regulation J-3) and the departmental requirements for the B.S. or B.A., except that an approved related field or established minor is not required for the B.F.A. degree. Additional requirements include:

STUDIO AREA – 12-20 credits
A minimum of 12 credits is taken in course work directly related to the area of specialization. Students with a performance specialization are required to take an additional 8 credits.

RELATED STUDIO – 9 credits
A minimum of 9 credits is taken in a related studio area that generally pertains directly to the student's area of specialization.

CRAFT AREA – 11 credits
A minimum of 11 credits is taken in courses to develop specific craft skills associated with the studio area.

HISTORY/LITERATURE/CRITICISM – 3 credits
A minimum of 3 credits is taken in history of literature courses that relate directly to the studio area. Courses used to fulfill university and department core requirements may not be used to satisfy this requirement.

THEATRE ARTS (B.A. or B.S.)

Required course work includes the university requirements (see regulation J-3), the general requirements for either the B.A. or B.S. degree, and:

Course	Credits
ThA 100 Theatre Process & Production	3
ThA 102 Theatrical Makeup	2
ThA 103 Introduction to Stagecrafts	3
ThA 104 Advanced Stagecrafts	3
ThA 105-106 Basics of Performance	4
ThA 271 Play Analysis	3
ThA 301-302 Visual Theatre & Design	6
ThA 467-468 The Theatre	6
ThA 471 Directing	3
One course chosen from the following	3
Eng 212 Critical Approaches to Literature II	
Eng 345 Shakespeare	
Eng 436 Advanced Shakespeare	
Eng 437 English Drama to 1642	
Eng 438 English Drama, 1660-1800	
Eng 439 Modern English & American Drama	
Electives in acting/directing	6
Electives in design/production	6
Courses in a related field approved by dept chair or established minor	20

Academic Minor Requirements

TECHNICAL THEATRE MINOR

Course	Credits
ThA 103 Introduction to Stagecrafts	3
ThA 104 Advanced Stagecrafts	3
ThA 301-302 Visual Theatre & Design	6
ThA 364 Scene Design I	3
ThA 373 Stage Lighting	3
ThA 390 Theatre Practice II	2

THEATRE ARTS MINOR

Course	Credits
ThA 102 Theatrical Makeup	2
ThA 103 Introduction to Stagecrafts	3
ThA 104 Advanced Stagecrafts	3
ThA 272 Intermediate Acting	3
ThA 301-302 Visual Theatre & Design	6
ThA 471 Directing	3

THEATRE ARTS PERFORMANCE MINOR

Course	Credits
ThA 272-273 Intermediate Acting	6
Courses chosen from the following	12
ThA 150 Performance Lab (max 3)	
ThA 271 Play Analysis	
ThA 305 Methods in Characterization	
ThA 306 Advanced Acting	
ThA 407 Acting Shakespeare	
ThA 408 Styles of Acting	
ThA 471 Directing	

VETERINARY SCIENCE—see Department of Animal and Veterinary Science

Division of Vocational Teacher and Adult Education

Jerry L. Tuchscherer, Div. Director (210 Educ. Bldg.).

Business Education Faculty: John P. Holup, Linda Miller, Constance Pollard, Martha C. Yopp.

Industrial Technology Education Faculty: James M. Cassetto, Melvin J. Pedras (chair), John A. Ristow.

Vocational Teacher and Adult Education Faculty: James A. Bikkie, James M. Cassetto, Glenn A. Edmison, John P. Holup, Jack J. Kaufman, Linda Miller, John Mundt, Douglas A. Pals, Melvin J. Pedras, Constance Pollard, Lou E. Riesenberg, John A. Ristow, Laurie A. Stenberg, G. Cleve Taylor, Jerry L. Tuchscherer, Martha C. Yopp.

The professional degree majors in vocational education provide both the opportunity and skills to enable vocational teachers to work effectively with today's youth and adults. Students benefit from the realistic relationship between course work and occupational competencies prospective teachers have acquired, or are acquiring, in business, industry, farming, or the home.

Preservice teaching degree majors are offered in: business education (B.S.Bus.Ed.), marketing education (B.S.Bus.Ed.), office occupations education (B.S.Bus.Ed.), industrial technology education (B.S.Ed.), and trade and industrial/technical education (B.S.Ed.) in the College of Education; and agricultural education (B.S.Ag.Ed.), and home economics education (B.S.H.Ec.) in the College of Agriculture. (See Admission to Teacher Education Program.)

A nonteaching major is available in office administration (B.S.O.Ad.) through the College of Education for students who wish to capitalize on their secretarial and office skills.

The undergraduate program in industrial technology education includes two degree programs. One is the Bachelor of Technology degree in industrial technology, which prepares students for technical and professional careers in industry or business. The B.S.Ed. degree, with a major in industrial technology education, provides opportunities for students to develop skills in several technical areas and also prepares them for certification as industrial education or technical education teachers in the secondary schools.

Sequential inservice undergraduate trade and industrial/technical education degree courses, as well as selected graduate vocational courses, are offered each semester at area vocational/technical schools located at Coeur d'Alene, Lewiston, Boise, and Twin Falls.

The graduate program is designed with flexibility to permit each student to pursue an individualized concentration in vocational education. Certification regulations permit permanent certification for certain occupational subjects taught at the undergraduate level. The graduate program offers these teachers an opportunity to prepare for other staff responsibilities. Among the various career objectives a graduate student may choose are positions as curriculum coordinator, cooperative education coordinator, supervisor of instruction, and administrator of vocational programs. In addition to seeking these local staff opportunities, many graduates of the vocational education program prepare for master-teacher assignments at the secondary level or as postsecondary (two-year college) instructors.

The graduate degrees of Master of Science, Master of Education, and Specialist in Vocational Education (sixth year) are offered through the division. Doctoral programs in the division are offered under the major in "education."

A student with a baccalaureate degree from an approved college or university with a major in one of the following related areas may apply for graduate study in vocational education: adult education, agriculture, business occupations, guidance and counseling, health occupations, home economics, industrial technology, marketing education, technology (engineering), trade and industrial/technical education, or vocational special needs.

A student with a baccalaureate degree with a major in a nonrelated area must have work experience appropriate to a related area in order to apply for graduate study in vocational education and/or (1) certification by the State Division of Vocational Education as a vocational teacher in Idaho, (2) baccalaureate degree in a recognized vocational field, (3) a baccalaureate degree, occupational experience, and current employment as a vocational teacher, or (4) a baccalaureate degree, occupational experience, and current work towards employment as a vocational teacher—with approval of the division's graduate committee.

Of special interest at the graduate level is the opportunity to concentrate studies in adult education, guidance and counseling, and vocational special needs.

Courses

ADULT EDUCATION

AdEd **J473/J573 Foundations of Adult Education** (3 cr). Philosophical, economic, sociological, and psychological bases of adult education; roles, limitations, and coordination of adult education, domestic and international programs—public and private sector. Additional projects/assignments reqd for grad cr.

AdEd **474 Psychology of Adult Learners** (3 cr) (C). Psychological, social, and physiological characteristics of adult learners; relationships to family, friends, and fellow citizens.

AdEd **475 Program Development in Adult Education** (3 cr). Adult education program development, organization, and instructional program; problems and trends.

AdEd **J476/J576 Communication Skills for Teachers of Adults** (3 cr). Development of communication skills for use with culturally diverse adults; verbal and nonverbal techniques for improving communication skills. Additional projects/assignments reqd for grad cr.

AdEd **573 Foundations of Adult Education** (3 cr). See AdEd J473/J573.

AdEd **574 Psychology of Adult Learners** (3 cr). Psychological, social, and physiological characteristics of adult learners; relationships to family, friends, and fellow citizens.

AdEd **575 Strategies for Teaching Adults** (3 cr). Design and application of teaching strategies for learning domains and learning styles appropriate for adult learners.

AdEd **576 Communication Skills for Teachers of Adults** (3 cr). See AdEd J476/J576.

BUSINESS EDUCATION

BusEd **101-102 Typewriting I-II** (2 cr). BusEd 101: development of skill sufficient for personal use. BusEd 102: speed and control to occupational competence levels.

BusEd **104 Keyboarding** (1 cr). Microcomputer keyboarding skills development. Accelerated 9-wk course. Two lec and 2 hrs of lab a wk.

BusEd **185 Machine Calculation** (2 cr). Operation of commonly used office adding-calculation machines for the solution of business mathematics problems.

BusEd **200** (s) **Seminar** (cr arr). Prereq: perm.

BusEd **203** (s) **Workshop** (cr arr). Prereq: perm.

BusEd **204** (s) **Special Topics** (cr arr).

BusEd **J210/J410 Alphabetic Shorthand I** (1 or 2 cr). Alphabetic shorthand theory, practice, dictation, and transcription (1 cr, 1/2 sem); comparative analysis of alphabetic shorthand systems and methods of teaching alpha shorthand (1 cr, 1/2 sem). Additional projects/assignments reqd for upper-div cr. Two lec and 2 hrs of lab a wk.

BusEd **299** (s) **Directed Study** (cr arr). Prereq: perm.

BusEd **311 Alphabetic Shorthand II** (2 cr). Speed and transcription skill development including machine transcription and methods of teaching alphabetic shorthand for vocational preparation and note taking.

BusEd **C312 Local Government Records Management** (2 cr) (C). Primarily for city clerks and other city officials. Records management, microfilming, filing, and filing equipment useful in city government record-keeping functions; legal requirements of destruction and disposal of city records in Idaho; practice of a number of city officials in Idaho in indexing city council meetings and maintaining city council files.

BusEd **395 Administrative Office Procedures** (3 cr). Administrative office procedures, components, and responsibilities.

BusEd **396 Information Processing** (3 cr). Information processing concepts and applications.

BusEd **400** (s) **Seminar** (cr arr). Prereq: perm.

BusEd **403** (s) **Workshop** (cr arr). Prereq: perm.

BusEd **404** (s) **Special Topics** (cr arr).

BusEd **410 Alphabetic Shorthand** (1 or 2 cr). See BusEd J210/J410.

BusEd **413 Administrative Office Management** (3 cr). Prepares students to assume management role in supervision of people, procedures, and equipment.

BusEd **J415/J515 Microcomputer Applications** (2-3 cr) (415, C). Same as ITED J415/J515. Computer applications course designed primarily for office administration and business teacher education students; includes hands-on experience using word processing, spreadsheet, and database management software packages; includes some methodology, curriculum development, and classroom management techniques. If taken for 2 cr involves learning and applying the software; if taken for 3 cr includes sizable curriculum development project. Grad students do an advanced project. Three lec and 2 hrs of lab a wk.

BusEd **418 Teaching Consumer Economics** (2 cr). Methods and materials for teaching consumer economics. Prereq: Econ 151 or 100 or equiv.

BusEd **J419/J519 Word Processing** (3 cr). Same as ITED J419/J519. Word processing concepts and applications for non-office occupation majors. Additional projects/assignments reqd for grad cr. Three lec and 3 hrs of lab a wk.

BusEd **460 Desktop Publishing** (3 cr). Same as ITED 460. Intro to desktop publishing through use of computer technology. Prereq: ITED 328 or BusEd 419 or BusEd 415 or perm.

BusEd **490 Records Management** (3 cr). ARMA filing rules, organization and maintenance of paper files, using database management software.

BusEd **491-492 Teaching Business Education I-II** (2-3 cr). Methods and materials. BusEd 491: basic business subjects. BusEd 492: office occupations. Prereq: perm.

BusEd **493 Teaching Marketing Education** (3 cr). Same as VocEd 493. Selection, organization, and presentation of subject matter pertaining to preparatory marketing education programs at the secondary-school level; emphasis on teaching methods and techniques.

BusEd **494 Marketing Education Materials** (2 cr). Same as VocEd 494. Examination, development, and application of instructional materials in marketing education.

BusEd **495 Supervising DECA Programs** (2 cr). Same as VocEd 495. Role of DECA in marketing education; organization and implementation of youth activities.

BusEd **496 Directed Work Experience** (2 cr). Same as VocEd 496. Job analysis and descriptions; weekly work-experience reports and analysis coordinated with problems related to the student's employment in an approved work station. Prereq: perm.

BusEd **497 Coordination Techniques** (3 cr). Same as VocEd 497. Problems of coordinator in cooperative part-time program; guidance and selection; placing students in work stations; assisting job adjustment; developing training program.

BusEd **498 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

BusEd **499** (s) **Directed Study** (cr arr). Prereq: perm.

BusEd **500 Master's Research and Thesis** (cr arr).

BusEd **501** (s) **Seminar** (cr arr). Prereq: perm.

BusEd **502** (s) **Directed Study** (cr arr). Prereq: perm.

BusEd **503** (s) **Workshop** (cr arr). Prereq: perm.

BusEd **504** (s) **Special Topics** (cr arr).

BusEd **515 Microcomputer Applications** (2-3 cr). See BusEd J415/J515.

BusEd **519 Word Processing** (3 cr). See BusEd J419/J519.

BusEd **520 Office Occupations Subjects** (3 cr). Methods and materials; achievement standards; review of literature and research. Prereq: perm.

BusEd **521 Basic Business Subjects** (3 cr). Methods and materials; achievement standards; review of literature and research. Prereq: perm.

BusEd **522 Issues in Business Education** (3 cr). Philosophies, objectives, trends, and organization patterns of business education in secondary schools. Prereq: perm.

BusEd **523 Adult Marketing Education** (3 cr). Establishing and developing adult programs in marketing education. Prereq: perm.

BusEd **524 Issues in Marketing Education** (3 cr). Same as VocEd 524. Philosophies, objectives, trends, and organization patterns of marketing education in secondary schools. Prereq: perm.

BusEd **597** (s) **Practicum** (cr arr). Prereq: perm.

BusEd **598** (s) **Internship** (cr arr). Prereq: perm.

BusEd **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

INDUSTRIAL TECHNOLOGY EDUCATION

ITED **110 Introduction to Technology** (2 cr). Intro to modern technology including communication, manufacturing, construction, and transportation. Two lec and 2 hrs of lab a wk.

ITED **R115 Operational Safety** (3 cr). Fundamentals of industrial safety; fire protection, industrial hygiene, radiological safety, safety regulations.

ITED **120 Principles of Technology I** (3 cr). Application of physical science in industrial situations; emphasizes principles rather than specifics of technology; illustrates application of mathematics associated with these principles. Three lec and 2 hrs of lab a wk. Enrollment per section limited to lab stations available.

ITED **121 Principles of Technology II** (3 cr). Continuation of ITED 120. Advanced units of applied physics with focus on major systems of mechanical, fluid, thermal, and electrical. Three lec and 2 hrs of lab a wk. Prereq: ITED 120.

ITED **130 Basic Electronics I** (3 cr). For beginning students with no experience in electricity; properties of resistors, capacitors, and inductors in electrical circuit; basics of power distribution system and house wiring; use of meters and oscilloscopes in lab. Three 1-hr lec and one 2-hr lab a wk. Enrollment per section limited to lab stations available. Knowledge of algebra recommended.

ITED **131 Electronics II** (3 cr). Continuation of ITED 130. Fundamentals of diodes, power supplies, transistor amplifiers, oscillators, and communication devices. Three 1-hr lec and one 2-hr lab a wk. Enrollment per section limited to lab stations available. Prereq: ITED 130 or equiv; knowledge of algebra recommended.

ITED **R132 General Electricity/Electronics** (3 cr). Discussion of basic electrical circuits; designed for beginning students with no knowledge or experience in electricity.

ITED **R135 Electrical Systems** (3 cr). Fundamentals of AC/DC circuits and components, motors, transformers, and switchgear, national electrical code wiring requirements.

ITED **140 Wood Technics** (3 cr). Basic fabricating skills in machine and tool processing of wood material and products; technical information on a wide range of wood and allied products; selection and fabrication of wood products. Two lec and 3 hrs of lab a wk. Enrollment per section limited to lab stations available.

ITED **170 Wood Product Design and Fabrication** (3 cr). Principles of design applied to a wide variety of wood products and fabrication processes; furniture, cabinetwork, lami-

nated products, molding, wood turning, silicon rubber mold production. Two lec and 3 hrs of lab a wk. Enrollment per section limited to lab stations available. Prereq: ITED 140.

ITED **200** (s) **Seminar** (cr arr). Prereq: perm.

ITED **203** (s) **Workshop** (cr arr). Prereq: perm.

ITED **204** (s) **Special Topics** (cr arr). Prereq: perm.

ITED **R210 Introduction to Industrial Efficiency** (3 cr). Industrial engineering techniques and approaches for supervisors.

ITED **R211 Introduction to Quality Assurance** (3 cr). Overview; emphasis on nuclear industry; planning, managing, conducting, and evaluating quality assurance program.

ITED **213 Technical Sketching** (2 cr). Sketching techniques applied to industrial drawing; emphasis on sketching or mechanical drawings, pictorials, and architectural forms. One lec and 1 hr of lab a wk.

ITED **R215 Electronic Components** (3 cr). Physical and electrical characteristics of electronic devices; emphasis on solid state devices; includes discrete and integrated circuit components.

ITED **R217 Principles of Dimensional Inspection** (3 cr). Concepts, prin, classification, and control in dimensional inspection for quality assurance.

ITED **218 Power, Energy, and Transportation** (3 cr). Internal-external combustion engines; solar, wind, water, biomass, and nuclear energy; lab experience in generating, transporting, and converting energy forms. Enrollment per section limited to lab stations available. Three lec and 2 hrs of lab a wk.

ITED **222 Mechanical Drawing** (2 cr). Theory and practice in multi-view drawing section and auxiliary drawing, shape and size description, dimensioning, descriptive geometry concepts, and technical illustration. One lec and 2 hrs of lab a wk.

ITED **235 Communication Electronics** (3 cr). Application of electronic circuits to communication equipment; radio receivers and transmitters; technical radio and TV for avocational use. Prereq: ITED 130, 131.

ITED **236 Industrial Electronics** (3 cr). Continuation of ITED 235. Theory and test procedures common to industrial control and automatic processing; computer electronics. Prereq: ITED 235.

ITED **237 Integrated Circuits and Semiconductor Devices** (3 cr). Basic theory and application of field effects transistors, integrated circuits, op-amps, optoelectronic devices, and miscellaneous semiconductor devices. Enrollment per section limited to lab stations available. Prereq: ITED 130, 131, or equiv.

ITED **238 Digital Electronics** (3 cr). Basic logic circuits used in digital devices; included AND/OR gates, NAND, NOR, Exclusive-or gates, and application of the gates to construct flip-flops, counters, adders, and converters; includes characteristics of logic families and memory devices. Enrollment per section limited to lab stations available. Prereq: ITED 237 or equiv.

ITED **R240 Electronics and Control Systems** (3 cr). Complex frequency domain; application of electronic devices and systems; intro to control theory.

ITED **R245 Minicomputer Fundamentals** (3 cr). Machine language programming, use of minicomputer software, assembler programming, real-time programming, interrupt facilities, system allocation.

ITED **250 Introduction to Metals Manufacturing** (3 cr). Intro to manufacturing theory, applications, and processes including research and development, starting and organizing manufacturing companies, and product production and marketing. Three lec and 3 hrs of lab a wk.

ITED **251 Plastic** (2 cr). Materials and industrial methods of fabrication; vacuum, blow, and pressure forming; laminating; extrusion; plastisol and injection molding.

ITED **253 Advanced Metals Manufacturing** (3 cr) Advanced industrial manufacturing theory, applications, and processes including specialized access of production, design, research, and development of manufactured products. Three lec and 3 hrs of lab a wk. Prereq: ITED 250.

ITED **R260 Statics and Dynamics** (3 cr). Study of forces on structures at rest or moving at uniform or non-uniform velocity; basic concepts of stress analysis, machine design, hydraulics, and structure design.

ITED **R261 Strength of Materials for Mechanical Technology** (3 cr). Relationship between loads applied to non-rigid bodies and the resultant internal forces and induced deformations. Note: Will not substitute for engineering degree requirement.

ITED **R262 Piping Design** (3 cr). Piping schedules, pressure ratings, specifications, pipe stress calculations, and hanger selection; system component selection and specification. Prereq: ITED 261, 336.

ITED **R263 Structures and Concrete Design** (3 cr). Column and beams design and selection, use of steel construction handbook joint design; simple concrete slab and wall design. Note: Will not substitute for engineering degree requirement.

ITED **265 Computer Aided Drafting/Design** (2 cr). Application of fundamental principles of computer aided drafting and design; theory of and skill development in file creation, digitizing, plotting, and computer assisted design. One lec and 2 hrs of lab a wk.

ITED **270 Technical Competence** (1-10 cr, max 10). Cr awarded for technical competence gained from experience in area of concentration for degree being sought. ITED 270, 370, and 470 are graded P/F and are credited to the student's program as follows: 1/3 with soph-level standing and completion of 15 cr of formal course work in the program; 1/3 upon completion of the jr yr; and 1/3 upon completion of all other degree requirements. Max 36 cr in any combination of ITED 270, 370, 470, 490, 491, and 492.

ITED **280 Building Construction Technology** (3 cr). Systems approach to building construction technology, including footings, foundations, floor, wall, ceiling and roof systems; building materials and their use in construction. Two lec and 3 hrs of lab a wk. Enrollment per section limited to lab stations available. Prereq: ITED 140, 170.

ITED **299** (s) **Directed Study** (cr arr). Prereq: perm.

ITED **300 Finishing Materials and Methods** (2 cr). Alt/yrs. Methods and materials for finishing wood, metal, composition board, plastics, and other industrial products. Enrollment per section limited to lab stations available.

ITED **303 Advanced Machining Technology** (2-3 cr). Practice in fabrication of metals beyond that covered in ITED 253; extra cr for individual project. Charge for materials payable at Controller's Office. One lec and one 3-hr lab a wk. Enrollment per section limited to lab stations available. Prereq: perm.

ITED **R320 Electronic Drafting** (3 cr). Drafting philosophy as related to instrumentation and control circuits; design, layout, and fabrication of printed circuit boards; drafting as related to circuit fabrication.

ITED **328 Computer Applications for Industrial Technology** (3 cr). BASIC programming and industrial education software; applications including computer numerical control, computer aided drafting, computer aided manufacturing, and robotics. Enrollment per section limited to computer stations available.

ITED **R330 Industrial Instrumentation I** (3 cr). Use of electronic circuits and devices for process parameter measurements.

ITED **R331 Industrial Instrumentation II** (3 cr). Methods of process control from digital and analog signals; investigation of computer control concepts.

ITED **R332 Selection and Design of Machine Elements** (3 cr). Principles and characteristics of machine elements in mechanical design; bearings, gears, bolted joints, linkages.

ITED **R333 Computer Electronics** (3 cr). Logic of circuits, basic circuits used in computers, and interfacing hardware for computer peripherals.

ITED **R334 Energy Analysis of Machines** (3 cr). Thermodynamics and heat transfer, properties of substances, steady flow, cycles and their application to equipment, simple heat exchangers.

ITED **R335 Materials Application** (3 cr). Materials application in design, material properties, material selection as related to service conditions.

ITED **R336 Fluid Systems Design** (3 cr). Fluid flow in pipes, including pressure losses, seals, series and parallel flow, measurements and control, selection of equipment.

ITED **R337 Tool Design** (3 cr). Design of jigs, fixtures, gauges; tools are designed by the student to solve manufacturing problems.

ITED **R340 Nondestructive Examination Techniques and Methods** (3 cr). Intro to nondestructive testing, liquid penetrant exam, magnetic particle exam, and radiography in modern industry.

ITED **350 Alternative Energy Technology** (3 cr). Survey course for both nonmajors and majors in industrial education who wish to explore sources and industrial and commercial applications of alternate forms of energy. Enrollment per section limited to lab stations available.

ITED **360 Graphic Communication** (3 cr). Study of information and skills relative to graphic reproduction; using tools, materials, and processes pertaining to the printing-graphic arts industry. Enrollment per section limited to lab stations available. Two lec and 3 hrs of lab a wk.

ITED **R362 Environmental Health** (3 cr). Types, mechanisms, and magnitudes of toxicity and their relation to the human system as an industrial environmental problem; all types of metals, compounds, and reagents and their influence on human productivity; sampling and analysis of contaminants.

ITED **R363 Fire Protection Safety** (3 cr). Basic industrial safety practices as applied to fire protection services.

ITED **R364 Hazardous Materials** (1 cr). Handling, transportation, and storage of hazardous materials; how to protect and suppress fires that occur in hazardous materials.

ITED **365 Industrial Supervision** (2-3 cr). Alt/yrs. Principles and practices; duties and responsibilities of plant supervisors; use of rating scales and other employee evaluation devices; supervisory methods used in on-the-job and in-plant training program; methods of conducting job analysis; preparation and use of job descriptions.

ITED **R366 Fire Department Organization and Management** (3 cr). Theory of fire dept organization for full-time, part-time, and volunteer depts; management philosophies, dealing with the public, assessing and defining goals, budgeting, codes and standards.

ITED **R368 Fire Investigation** (3 cr). Investigation techniques in determining the source and contributing factors in fire losses; analysis of history as it relates to present-day codes and standards. Prereq: perm.

ITED **370 Technical Competence** (1-10 cr, max 10). See ITED 270.

ITED **375 Heat Treatment of Metals** (2 cr). Properties of metals, annealing and normalizing, hardening, tempering, surface hardening, stress relief of welds; equipment and methods. One lec and one 3-hr lab a wk. Enrollment per section limited to lab stations available. Prereq: perm.

ITED **380 Computer Numerical Control Technology** (3 cr). Overview; advanced computer aided drafting, computer aided manufacturing, computer numerical control, and robotics, with lab applications. Enrollment per section limited to lab stations available. Three lec and 3 hrs of lab a wk. Prereq: ITED 328 or equiv.

ITED **400** (s) **Seminar** (cr arr). Prereq: perm.

ITED **R401 Principles of Quality Assurance** (3 cr). Preparation for Quality Engineering Certificate Exam offered by American Society for Quality Control.

ITED **R402 Principles of Reliability Assurance** (3 cr). Development of principles and methods of analyzing, testing, and predicting probability of successful performance of parts, components, and systems.

ITED **403** (s) **Workshop** (cr arr). Prereq: perm.

ITED **410 Metalworking Design and Manufacturing** (3 cr). Materials, tools, and processes of metal technology; students may specialize in one or several areas. Enrollment per section limited to lab stations available. Prereq: ITED 250, 253, 303, or perm.

ITED **J415/J515 Microcomputer Applications** (2-3 cr). See BusEd J415/J515.

ITED **J419/J519 Word Processing** (3 cr). See BusEd J419/J519.

ITED **420 Curriculum Development and Evaluation in Industrial Technology** (3 cr). Methods and techniques; curriculum development, use, and application in industrial arts education; evaluation methods, technical use of objective and subjective testing for education and industry.

ITED **R424 Computer Hardware Organization and Control** (3 cr). Arithmetic and related hardware; timing and control of computers; description of computer hardware/software interface.

ITED **425 Advanced Electricity-Electronics** (3 cr). Independent readings, research, and lab experimentation. Enrollment per section limited to lab stations available. Prereq: ITED 235, 236, or perm.

ITED **R430 Systems Safety Analysis** (3 cr). Principles of system safety; analytical trees; hazard and risk analyses; accident investigation.

ITED **R431-R432 Reactor and Nuclear Instruments** (3 cr). Nuclear electronics, including detection, application of instruments for reactor control and for experimental data acquisition.

ITED **R433 Quality Auditing** (3 cr). Industrial value of audit as a management tool; audit methods and techniques; present practical examples related to real-life applications and benefits.

ITED **R434 Quality Assurance Organization and Management** (3 cr). Industrial management principles applied to effective economic control of quality assurance activities.

ITED **R435 Industrial Transportation Safety** (3 cr). Principles of safety in all aspects of industrial transportation; roads, railroads, air, water, pipeline.

ITED **R436 Quality Assurance Application** (3 cr). Principles of quality assurance applied in a morphological manner to industrial operations.

ITED **R445 Digital Process Control** (3 cr). Application of digital computers for process control; use of digital control circuits and comparison of digital and analog signals; multiple computer control.

ITED **450 Industrial Safety** (3 cr). See VocEd 450.

ITED **451 School Lab Planning and Administration** (3 cr). See VocEd 451.

ITED **R452 Fire Protection System Design** (3 cr). Methods and practical design of fire protection systems (water, gas, chemicals); testing and maintenance of systems. Prereq: perm.

ITED **R454 Environmental Health II** (3 cr). Intro of human system response and susceptibility to problems of occupation originating from air conditioning, air cleaning, ventilation, respiratory devices, air pressure, noise, lighting, temperature, and radiation; identification, documentation, and reporting of problems and results.

ITED **460 Desktop Publishing** (3 cr). See BusEd 460.

ITED **R464 Nuclear Reactor Codes and Standards** (3 cr). See NE 462.

ITED **470 Technical Competence** (1-12 cr, max 12). See ITED 270.

ITED **472 Industrial Technology Teaching Methods** (3 cr). Dem, lec, and problem solving; preparation and use of instructional aids, individual instruction sheets, and programmed instructional materials.

ITED **480 History and Philosophy of Industrial Education** (3 cr). Development of vocational and general education phases of industrial education; comparative and conflicting philosophies; leaders and their contributions.

ITED **490-491-492 Advanced Technical Competence** (1-10 cr, max 30). Supervised practicum or on-the-job experience designed to enable the student to gain further depth in technical competence as well as in current industrial technology. Graded P/F. Max 30 cr in any combination of ITED 270, 370, 470, 490, 491, and 492.

ITED **499** (s) **Directed Study** (cr arr). Prereq: perm.

ITED **500 Master's Research and Thesis** (cr arr).

ITED **501** (s) **Seminar** (cr arr). Prereq: perm.

ITED **502** (s) **Directed Study** (cr arr). Prereq: perm.

ITED **503** (s) **Workshop** (cr arr). Prereq: perm.

ITED **504** (s) **Special Topics** (cr arr). Prereq: perm.

ITED **510 Professional Problems** (1-3 cr, max 6). Prereq: perm.

ITED **511 Technical Problems** (1-3 cr, max 6). Prereq: perm.

ITED **515 Microcomputer Applications** (2-3 cr). See BusEd J415/J515.

ITED **R518 Industrial Liability** (3 cr). Workman's compensation, second injury, insurance and self-insurance; third party responsibilities; product liability, personal liability; plant damage.

ITED **519 Word Processing** (3 cr). See BusEd J419/J519.

ITED **R520 Occupational Health Hazards** (3 cr). Field of industrial hygiene practice; focus on recognition, evaluation, and control of occupational health hazards.

ITED **R521 Advanced System Safety** (3 cr). Systematic safety concepts, principles, and methods; development of skills in accident investigation, audit and appraisal, operational readiness, and system safety analysis and review. Prereq: ITED 430.

ITED **R522 Risk Assessment** (3 cr). Risk analysis methods relative to safety problems and alterations.

ITED **R523 Industrial Safety Applications** (3 cr). Application of engineering science to safety problems; static and dynamic forces on structures, pressure systems; effects of temperature, chemicals, fatigue, and other agencies on strength of materials; use of vectors in engineering analysis.

ITED **530 Administration and Supervision of Industrial Education Programs** (3 cr). Principles and practices; secondary-school and post-high-school levels; federal and state legislation concerning industrial education programs.

ITED **540 Instructional Media for Industrial Education** (3 cr). Preparation and use of new industrial media and systems for industrial-technical arts and vocational-technical subjects.

ITED **599** (s) **Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

VOCATIONAL TEACHER EDUCATION

MAJORS: Trade and industrial/technical education, and vocational-technical education majors fulfill their major requirements from the courses listed in this section.

RELATED FIELDS: For those course offerings in vocational teacher education, see agricultural education, guidance and counseling, and home economics.

VocEd **200** (s) **Seminar** (cr arr). Prereq: perm.

VocEd **203** (s) **Workshop** (cr arr). Prereq: perm.

VocEd **204** (s) **Special Topics** (cr arr).

VocEd **206** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

VocEd **270 Technical Competence I** (1-10 cr, max 10). Cr may be awarded to students who are recommended by the State Dept of Vocational Education, in cooperation with UI, as qualified to teach in the technical phase of a vocational subject matter. Cr for technical competence will not qualify toward fulfilling sr residency requirements. Grades for successful completion of VocEd 270, 370, and 470 will be entered as P (pass). Prereq: 9 cr in residence in vocational teacher education.

VocEd **299** (s) **Directed Study** (cr arr). Prereq: perm.

VocEd **306 Preservice for New Vocational Teachers** (3 cr). Fundamental skills necessary for new vocational teachers in secondary and postsecondary schools to be successful in meeting students.

VocEd **307 Inservice for New Vocational Teachers** (3 cr). Resolution of common problems faced by new teachers through seminars and observations/evaluations/perceptions by UI preceptor; course meets state certification requirements for 30 hrs of inservice for vocational specialist certification. Prereq: perm.

VocEd **J351/J551 Principles and Philosophy of Vocational Education** (2-3 cr). VocEd 351 same as AgEd 351. The interpretation of philosophical, social, and economic factors that influence vocational education; current issues and trends. Students who take course for 3 cr or at the grad level are reqd to complete additional assignments, papers, and/or presentations.

VocEd **370 Technical Competence II** (1-10 cr, max 10). See VocEd 270. Prereq: completion of jr yr in vocational teacher education.

VocEd **400** (s) **Seminar** (cr arr). Prereq: perm.

VocEd **403** (s) **Workshop** (cr arr). Graded P/F. Prereq: perm.

VocEd **404** (s) **Special Topics** (cr arr).

VocEd **J405/J505 Professional Development** (cr arr). Cr earned in this course will not be accepted toward grad degree programs. Professional development and enrichment. Additional projects/assignments reqd for grad cr.

VocEd **406** (s) **Study Abroad** (cr arr). Prereq: perm of dept.

VocEd **J418/J518 Education Using Learning Styles** (3 cr). Assessment and teaching based on learning styles; designed for learning characteristics of special needs students. Additional projects/assignments reqd for grad cr.

VocEd **420 Evaluation in Vocational Education** (3 cr). Methods and techniques; construction and use of objective tests, performance tests, rating scales, check lists.

VocEd **426 Analysis and Curriculum Development in Vocational Education** (3 cr) (VocEd 462). Principles of occupational analysis and course construction; competency-based; course and curriculum development, trends, and concepts.

VocEd **443 Introduction to Special-Needs Education** (1 cr). History, background, and concept of special needs.

VocEd **444 Identifying Special-Needs Students** (2 cr). Emphasis on methods of assessment and evaluation. Prereq or coreq: VocEd 443.

VocEd **450 Industrial Safety** (3 cr). Same as ITED 450. Organization and administration of safety programs in industry and vocational-technical education laboratories; materials, research literature, methods, and techniques for industrial safety education.

VocEd **451 School Lab Planning and Administration** (3 cr). Same as ITED 451. For those in or entering occupational education who seek a competency-based approach to planning, organizing, and managing a school teaching lab/shop.

VocEd **453 Task Analysis** (1 cr). Intro to task analysis methods, tech, and procedures.

VocEd **464 Vocational Guidance** (3 cr). Same as Couns 464. Identification of individuals who can profit from vocational-technical education program; information for realistic vocational and educational planning; adjustments in vocational-educational program; occupational placement and adjustment; follow-up procedures.

VocEd **470 Technical Competence III** (1-12 cr, max 12). See VocEd 270. Prereq: enrollment in the final semester of the degree program in vocational teacher education.

VocEd **471 Practicum: Vocational Education Teaching** (3-10 cr, max 10). Secondary majors are reqd to enroll for 10 cr. Supervised teaching in approved vocational programs at secondary schools or area vocational-technical schools. Graded P/F. Prereq: Ed 314, or VocEd 426, 472, GPA of 2.50, and perm of dept. (Submit application via director of vocational and adult education to director of clinical experiences in teacher education.)

VocEd **472 Vocational Education Methods** (3 cr). Selection and application of appropriate teaching methods; emphasis on demonstration, lecture, problem solving methods, learning activity packages, and instructional media and technology.

VocEd **480 Advanced Technical Competence** (1-6 cr, max 6). Experiences to enable the individual to gain depth in technical competency beyond the basic certification requirements, and to maintain skills in harmony with current industrial practice. Prereq: perm.

VocEd **493 Teaching Marketing Education** (3 cr). See BusEd 493.

VocEd **494 Marketing Education Materials** (2 cr). See BusEd 494.

VocEd **495 Supervising DECA Programs** (2 cr). See BusEd 495.

VocEd **496 Directed Work Experience** (2 cr, max 6). See BusEd 496.

VocEd **497 Coordination Techniques** (3 cr). See BusEd 497.

VocEd **498 Practicum in Tutoring** (1 cr, max 2). Tutorial services performed by advanced students under faculty supervision. Graded P/F. Prereq: perm.

VocEd **499 (s) Directed Study** (cr arr). Prereq: perm.

VocEd **500 Master's Research and Thesis** (cr arr).

VocEd **501 (s) Seminar** (cr arr). Prereq: perm.

VocEd **502 (s) Directed Study** (cr arr). Prereq: perm.

VocEd **503 (s) Workshop** (cr arr). Prereq: perm.

VocEd **504 (s) Special Topics** (cr arr).

VocEd **505 Professional Development** (cr arr). See VocEd J405/J505.

VocEd **506 (s) Study Abroad** (cr arr). Prereq: perm of dept.

VocEd **507 Issues in Vocational and Adult Education** (3 cr). Philosophies, objectives, trends, research, organizational patterns, and governmental relationships for vocational and adult education programs.

VocEd **514 Career Development and Life-Style Planning** (3 cr). See Couns 514.

VocEd **515 Instructional Strategies** (3 cr). Principles, concepts, aims and applications of program and teaching strategies.

VocEd **518 Education Using Learning Styles** (3 cr). See VocEd J418/J518.

VocEd **524 Issues in Marketing Education** (3 cr). See BusEd 524.

VocEd **526 Analysis and Curriculum Development in Vocational and Adult Education** (3 cr) (VocEd 512). Teaching of occupational analysis; development of competency-based curriculum; selection and organization of instructional materials.

VocEd **543 Administration and Supervision in Vocational Education** (3 cr). Theory and practice of administering and supervising vocational education programs at all levels.

VocEd **544 Modifying Vocational Program for Students with Special Needs** (3 cr). Product oriented course aimed at skills of vocational education teachers in developing courses for students with vocational special needs. Prereq: VocEd 443, 444.

VocEd **545 Facility Planning** (3 cr). Principles and procedures in planning secondary and postsecondary vocational facilities.

VocEd **551 Principles and Philosophy of Vocational Education** (2-3 cr). See VocEd J351/J551.

VocEd **555 Program Evaluation in Vocational Education** (3 cr). Principles and procedures used in the evaluation of vocational programs.

VocEd **560 Theories of Vocational Choice** (3 cr). See Couns 560.

VocEd **564 Special Needs Communication Skills** (3 cr). Development of communication skills for use in mainstreaming handicapped and disadvantaged vocational students; makes use of simulations.

VocEd **570 Principles and Concepts of Research** (3 cr). Reasons and rationale for quantitative analyses; assumptions needed for selecting an analytic strategy.

VocEd **571 Accessing, Organizing, and Synthesizing Data** (3 cr). Uses of computer-based statistics packages, document retrieval services, and text-editing systems in research. Prereq: Stat 251 or perm.

VocEd **581 Leadership Behavior for Vocational Personnel** (3 cr). Management of human resource development study for education and vocation personnel employed as teachers and/or dept administrators; primarily directed at area vocational/technical schools.

VocEd **597 (s) Practicum** (cr arr). Application of theories and techniques; supervised field experiences in selected settings. Graded P/F. Prereq: perm.

VocEd **598 (s) Internship** (cr arr). Supervised experience in teacher education, administration, supervision, or ancillary services in vocational education. Graded P/F. Prereq: perm.

VocEd **599 (s) Research** (cr arr). Research not directly related to a thesis or dissertation. Prereq: perm.

VocEd **600 Doctoral Research and Dissertation** (cr arr).

Curricular Requirements

BUSINESS EDUCATION (B.S.Bus.Ed.)

This major is for students whose primary interest is in teaching basic business subjects and economics. Required course work includes the university requirements (see regulation J-3), the general requirements for students preparing to teach at the secondary level, and:

Course	Credits
BusEd 102 Typewriting II	2
BusEd 185 Machine Calculation	2
BusEd 415 Microcomputer Applications	3
BusEd 418 Teaching Consumer Economics	2
BusEd 419 Word Processing	3
BusEd 491-492 Teaching Business Education I-II	6
Acctg 201 Principles of Accounting	3
Acctg 202 Managerial Accounting	3
BLaw 265 Legal Environment of Business	3
Econ 151, 152 Principles of Economics	6
Eng 313 Business Writing	3
HEc 448 Consumer Education	3
One of the following sequences	6
Acctg 301-302 Financial Accounting & Reporting I-II	
Bus 407 Financial Institutions and 401 Investments	
Bus 418 Organization Theory and 412 Human Resource Management	
Econ 321 Interm Microanalysis and 372 Interm Macroanalysis	
Accounting, business, or economics electives	3-9

Note: Business education majors are urged to check with their advisers for vocational endorsement information.

INDUSTRIAL TECHNOLOGY (B.Tech.)

Designed to prepare students for both technical and professional careers in industry and business, particularly for supervisory and other mid-management level positions.

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
BLaw 265 Legal Environment of Business	3
Bus 311 Introduction to Management	3
Bus 332 Quantitative Methods in Business	3
Bus 370 Production/Operations Management	3
Bus 441 Labor Relations	3
Bus 456 Quality Control	3
BusEd/ITED 415 Microcomputer Applications	3
BusEd/ITED 419 Word Processing	3
BusEd/ITED 460 Desktop Publishing	3
Engr 101 Engineering Graphics	2
Eng 317 Technical & Engineering Report Writing	3
ITED 213 Technical Sketching	2
ITED 270, 370, 470 Technical Competence and/or ITED 490, 491, 492 Adv Technical Competence and/or approved technical electives	29
ITED 328 Computer Applications for Industrial Technology	3
Math 140 Precalculus Algebra & Analytic Geometry	3
Psych 100 Introduction to Psychology	3
Stat 251 Principles of Statistics or 301 Probability & Statistics	3

And 30 credits in one of the following technical specialization blocks: (1) material processing—woods, (2) material processing—metals, (3) electronics applications, (4) graphic arts management, (5) computer management, or (6) industrial generalist. For a listing of the specific courses required in each of these blocks, consult the chair of the department.

The minimum number of credits for the degree is 131.

INDUSTRIAL TECHNOLOGY EDUCATION (B.S.Ed.)

Required course work includes the university requirements (see regulation J-3), the general requirements for students preparing to teach at the secondary level (see College of Education section in part 4), and:

Course	Credits
ITED 110 Introduction to Technology	2
ITED 120 Principles of Technology I	3
ITED 130 Basic Electronics I	3
ITED 131 Electronics II	3
ITED 218 Power, Energy, & Transportation	3
ITED 222 Mechanical Drawing	2
ITED 250 Intro to Metals Manufacturing	3
ITED 253 Advanced Metals Manufacturing	3
ITED 265 Computer Aided Drafting/Design or Engr 101 Engineering Graphics	2
ITED 280 Building Construction Technology	3
ITED 328 Computer Appl for Industrial Technology	3
ITED 360 Graphic Communications	3
ITED 380 Computer Numerical Control Technology	3

ITED 420 Curr Dev & Eval in Industrial Technology 3
ITED 451 School Laboratory Planning & Administration 3
ITED 472 Industrial Technology Teaching Methods 3
AgMech 107 Beginning Welding 2

And one of the following options:

A. GENERAL INDUSTRIAL TECHNOLOGY OPTION: 13 credits in approved ITED courses distributed throughout several technology areas.

B. INDUSTRIAL TECHNOLOGY SPECIALIZATION OPTION: 13 additional credits in a specialized area of technology. Students may specialize in one of the following technology areas: electronics, manufacturing, graphic comm, construction technology, general technology, or computer technology.

C. TEACHING MINOR OPTION: 20-credit teaching minor to be selected from the list of "teaching majors and minors" in the College of Education section, page 4.

MARKETING EDUCATION (B.S.Bus.Ed.)

The marketing education major is for students who are interested in teaching marketing, merchandising, and management at the high-school or postsecondary level. Students electing this major should consult the marketing education adviser concerning state requirements for the vocational education certificate.

Required course work includes the university requirements (see regulation J-3), the general requirements for the student preparing to teach at the secondary level, and:

Course	Credits
Acctg 201 Principles of Accounting	3
Bus 321 Marketing	3
Bus 325 Retailing	3
Bus 420 Promotional Strategy	3
Bus 422 Sales Force Management	3
BusEd 493 Teaching Marketing Education	3
BusEd 497 Coordination Techniques	3
Econ 151 Principles of Economics	3
VocEd 351 Principles & Philosophy of Vocational Education	2
VocEd 453 Task Analysis	1
VocEd 464 Vocational Guidance	3
VocEd 494 Marketing Education Materials	2

And the completion of a 20-credit teaching minor or the following:

Additional requirements for a 60-credit concentration:

Econ 152 Principles of Economics	3
Eng 313 Business Writing	3
VocEd 200 Seminar or 499 Directed Study	3
Electives (approved by marketing ed teacher educator)	11

OFFICE ADMINISTRATION (B.S.O.Ad.)

This degree is for students whose primary interest is in secretarial administration and related office and business positions. Required course work includes the university requirements (see regulation J-3) and the following, including at least 52 credits in courses in Bus, Econ, Acctg, and BusEd and at least 52 credits in courses outside those areas:

Course	Credits
BusEd 102 Typewriting II	2
BusEd 185 Machine Calculation	2
BusEd J210/J410 Alphabetic Shorthand I	2
BusEd 311 Alphabetic Shorthand II	2
BusEd 395 Administrative Office Procedures	3
BusEd 396 Information Processing	3
BusEd 400 Seminar	1
BusEd 413 Administrative Office Management	3
BusEd 490 Records Management	3
BusEd 496 Directed Work Experience	2
Acctg 201-202 Principles of Acctg & Managerial Acctg	6
BLaw 265 Legal Environment of Business	3
Bus 311 Introduction to Management	3
Bus 321 Marketing	3
Bus 412 Human Resource Management	3
Bus 418 Organization Theory	3
CommG 131 Fundamentals of Public Speaking	2
Econ 151, 152 Principles of Economics or equivalent	6
Eng 313 Business Writing or 317 Tech & Engr Report Writing	3
One mathematics course	3
One statistics course	3
Upper-division business or economics electives	3
Electives to complete 128 cr for the degree	—

OFFICE OCCUPATIONS EDUCATION (B.S.Bus.Ed.)

Students whose primary interest is in teaching secretarial and clerical subjects and who wish to qualify for vocational certification elect this major. Consult the office occupations education adviser concerning state requirements for the vocational education certificate.

Required course work includes the university requirements (see regulation J-3), the general requirements for students preparing to teach at the secondary level (see College of Education section in part 4), and:

Course	Credits
BusEd 102 Typewriting II	2
BusEd 185 Machine Calculation	2
BusEd J210/J410 Alphabetic Shorthand I	2
BusEd 311 Alphabetic Shorthand II	2
BusEd 395 Administrative Office Procedures	3
BusEd 413 Administrative Office Management	3
BusEd 415 Microcomputer Applications	3
BusEd 418 Teaching Consumer Economics	2
BusEd 490 Records Management	3
BusEd 491-492 Teaching Business Education I-II	6
BusEd 497 Coordination Techniques	3
Acctg 201-202 Principles of Acctg & Managerial Acctg	6
BLaw 265 Legal Environment of Business	3
Econ 151, 152 Principles of Economics	6
Eng 313 Business Writing	3
HEc 448 Consumer Education	3
VocEd 351 Principles & Philosophy of Vocational Education	2
VocEd 464 Vocational Guidance	3
Business or economics electives	6

TRADE AND INDUSTRIAL/TECHNICAL EDUCATION (B.S.Ed.)

While serving preservice teachers in trade and industrial education, this degree is designed primarily for those teachers in area vocational schools and in secondary trade and industrial programs who do not hold degrees. Admission to the program is limited to those who can meet initial certification requirements for an Idaho type "A" vocational specialist certificate.

Required course work includes the university requirements (see regulation J-3) and:

Course	Credits
VocEd 270, 370, 470 Technical Competence	32
VocEd 351 Principles & Philosophy of Vocational Education	2
VocEd 420 Evaluation in Vocational Education	3
VocEd 426 Analysis & Curriculum Dev in Voc Ed	3
VocEd 450 Industrial Safety	3
VocEd 453 Task Analysis	1
VocEd 464 Vocational Guidance	3
VocEd 471 Practicum in Voc Ed Teaching or Ed 431 Secondary School Teaching*	3-9
VocEd 472 Vocational Education Methods	3
VocEd 497 Coordination Techniques	3
CommG 131 Fundamentals of Public Speaking or 132 Oral Interpretation	2
Hist 111 or 112 Intro to U.S. History or PolSc 101 Intro to American Politics	3
Psych 100 Introduction to Psychology	3
English or literature electives	6
Science-mathematics electives	12
Social science electives	6
Electives in general studies (to be selected from humanities, social sciences, and natural sciences)	4
VocEd electives	16-19
AdEd 473 Introduction to Adult Education	
VocEd 200, 400 Seminar (3-6 cr)	
VocEd 203, 403 Workshop (1-6 cr)	
VocEd 204, 404 Special Topics (3-6 cr)	
VocEd 299, 499 Directed Study (3-9 cr)	
VocEd 306 Preservice for New Vocational Teachers	
VocEd 307 Inservice for New Vocational Teachers	
VocEd 418 Education Using Learning Styles	
VocEd 443 Introduction to Special-Needs Education	
VocEd 444 Identifying Special-Needs Students	
Approved course in computer literacy (3 cr)	
Electives approved by vocational teacher educator	11

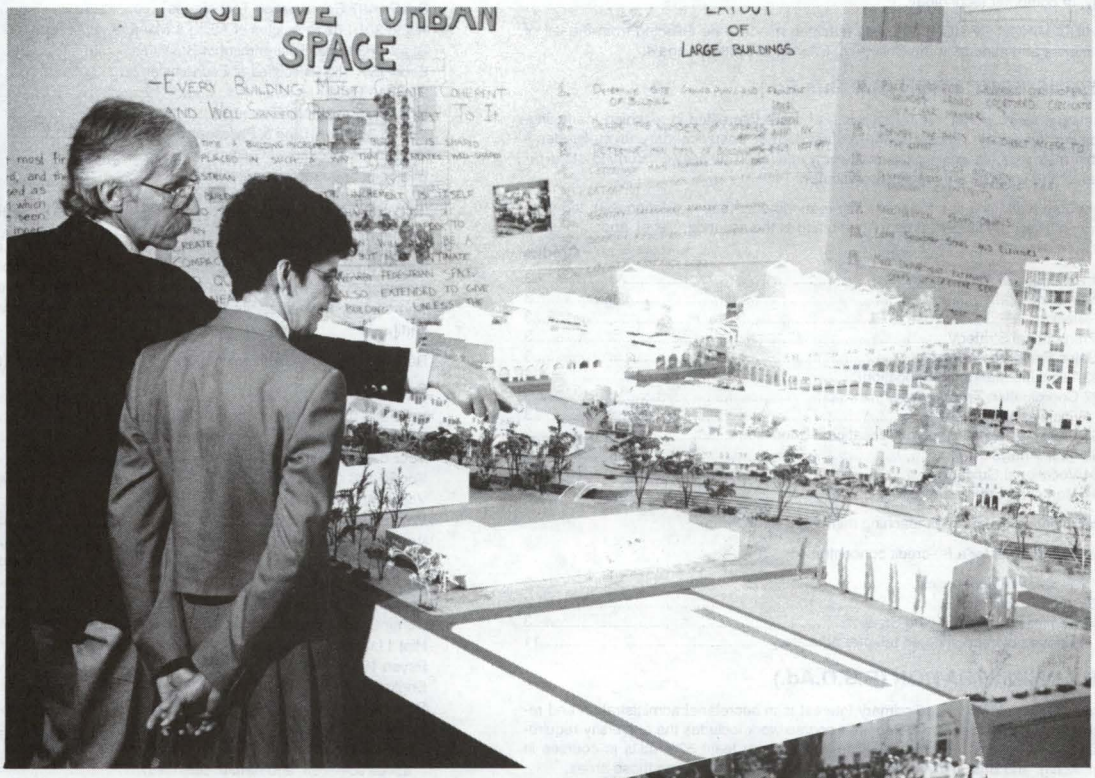
*If the student wishes to receive a standard secondary certificate, the requirement is Ed 431 or VocEd 471 and the following courses:

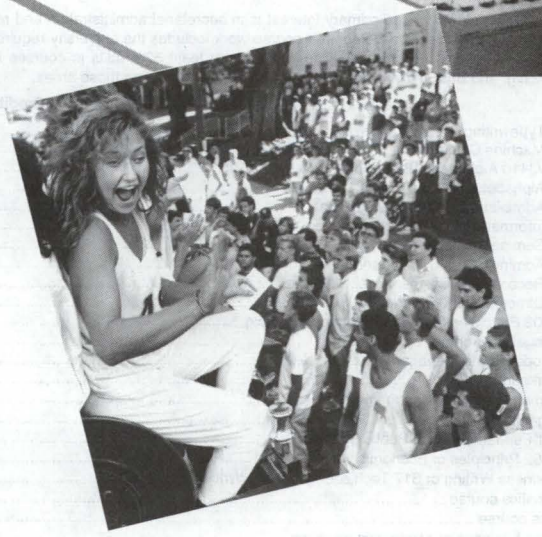
Ed 201 Intro to Teaching (if the student has no teaching experience)	2
Ed 312 Educational Psychology	2
Ed 314 Strategies for Teaching	3
Ed 340 Methods of Teaching Content Reading	3
Ed 445 Proseminar in Teaching	3
Ed 468 Historical & Philosophical Foundations of Ed	3

WILDLAND RECREATION MANAGEMENT—see Department of Resource Recreation and Tourism

WILDLIFE RESOURCES—see Department of Fish and Wildlife Resources

ZOOLOGY—see Department of Biological Sciences


SPACE
LARGE BUILDINGS



Faculty

Elisabeth A. Zinser, President; Thomas O. Bell, Vice President for Academic Affairs and Research; Karen J. Van Houten, Chair of the Faculty Council (1990-91); Duane J. LeTourneau, Secretary of the Faculty.

This list was compiled December 14, 1990. Off-campus personnel are identified with an asterisk (*). The date following a name indicates the beginning of service at the university. When two dates are given, the second, in parentheses, is the date of promotion to the rank shown.

*M. AUDREY AARON, 1971 (1976), Professor Emerita of Foreign Languages and Literatures (Spanish); A.B., 1934, Mount St. Scholastica; A.M., 1950, Ph.D., 1952, Johns Hopkins. Emerita since 1979 (now residing in Oklahoma City, Okla.).

ERNEST D. ABLES, 1973, Professor of Wildlife Resources; Associate Dean for Academics and Continuing Education, College of Forestry, Wildlife and Range Sciences, 1974-82, 1990- (Head, Department of Fish and Wildlife Resources, 1982-84, 1985-89; Acting Dean, 1984-85); B.S., 1961, Oklahoma State; M.S., 1964, Ph.D., 1968, Wisconsin.

*BARBARA B. ABO, 1976 (1984), Associate Extension Professor of Home Economics; Ada County Extension Home Economist, Boise; B.S., 1972, Wisconsin; M.S., 1975, Iowa State.

TERRY P. ABRAHAM, 1984, Head, Special Collections and Archives, University Library, with rank of Associate Professor; B.A., 1965, Washington; M.F.A., 1968, Washington State; M.L.S., 1970, Oregon.

DAVID L. ADAMS, 1971 (1975), Professor of Forest Resources (Head, Department of Forest Resources, 1979-87); B.S., 1959, Oklahoma State; M.F., 1961, Idaho; Ph.D., 1969, Colorado State.

DOUGLAS Q. ADAMS, 1972 (1981), Professor of English; A.B., 1968, A.M., 1971, Ph.D., 1972, Chicago.

GAIL H. ADELE, 1974 (1985), Professor of Mathematics; A.B., 1962, M.A., 1963, Indiana; Ph.D., 1968, Michigan State.

*STEPHEN B. AFFLECK, 1988, Affiliate Associate Professor of Chemical Engineering, Boise; B.S., 1960, Utah; M.S., 1973, Ph.D., 1980, Iowa State.

KATHERINE G. AIKEN, 1984, Assistant Professor of History; B.A., 1972, Idaho; M.A., 1974, Oregon; Ph.D., 1980, Washington State.

*RICHARD M. ALFORD, 1975, Affiliate Clinical Professor of Medical Science, Lewiston; B.S., 1945, Ursinus; M.D., 1949, Michigan.

*ROBERT E. ALLAN, 1976, Affiliate Professor of Plant Science, Pullman, Wash.; B.S., 1952, Iowa State; M.S., 1956, Ph.D., 1958, Kansas State.

*ROBERT C. ALLDAFFER, 1955 (1983), Extension Professor Emeritus; B.S.Ag., 1950, Idaho. Emeritus since 1983 (now residing in Soda Springs).

*CHARLES A. ALLEN, 1986, Affiliate Professor of Chemistry, Idaho Falls; B.S., 1962, Ottawa (Kansas); Ph.D., 1969, Oregon State.

*STEWART D. ALLEN, 1987, Affiliate Assistant Professor of Resource Recreation and Tourism, Missoula, Mont.; B.A., 1976, Utah; M.A., 1978, Claremont Graduate School; Ph.D., 1980, Montana.

*ALVIN R. ALLER, 1959 (1972), Professor Emeritus of Botany; B.S., 1931, Bethany; M.S., 1932, Kansas State; Ph.D., 1949, Oregon State. Emeritus since 1972 (now residing in Nampa).

*FLORENCE D. ALLER, 1962 (1971), Professor of Home Economics and Department Head Emerita (Head, Department of Home Economics, 1971-74); B.A., 1930, Bethany-Peniel; M.S., 1947, Oregon State; Ed.D., 1962, Idaho. Emerita since 1974 (now residing in Nampa).

DON A. AMOS, 1963, Business and Real Estate Manager, 1974-; B.S.Bus., 1952, Idaho.

DOYLE E. ANDEREGG, 1967, Professor of Biology; Associate Dean, College of Letters and Science, 1989-; Management Information Specialist (Assistant Dean, College of Letters and Science, 1981-89; Head, Department of Biological Sciences, 1967-75); B.Sc., 1952, M.S., 1957, Ph.D., 1959, Ohio State.

*BRUCE C. ANDERSON, 1978 (1984), Professor of Pathology, Caldwell; B.S., 1965, D.V.M., 1965, Ph.D., 1977, California (Davis).

CLIFTON E. ANDERSON, 1972 (1977), Associate Professor of Agricultural Information; Associate Agricultural and Extension Editor; B.S., 1947, Wisconsin; M.A., 1954, California (Berkeley).

ERIK T. ANDERSON, 1990, Assistant Extension Professor and Telecommunications Specialist; B.S., 1983, Idaho; M.A., 1985, Wisconsin.

*GUY R. ANDERSON, 1946 (1968), Professor of Bacteriology and Director of the WAMI Medical Education Program Emeritus; B.S.Ag., 1942, M.S.Ag., 1947, Idaho; Ph.D., 1956, Washington State. Emeritus since 1984 (now residing in Moscow).

*HAL N. ANDERSON, 1989, Affiliate Assistant Professor of Fish and Wildlife Resources, Boise; B.S., 1978, M.S., 1981, Idaho.

*JAMES H. ANDERSON, 1989, Affiliate Professor of Geology, Fairbanks, Alaska; B.S., 1964, Washington (Seattle); Ph.D., 1970, Michigan State.

MARK D. ANDERSON, 1982 (1990), Professor of Law; B.A., 1973, Macalester; J.D., 1977, Chicago.

MICHAEL J. ANDERSON, 1989, Assistant Professor of Mechanical Engineering; B.S.M.E., 1983, Oregon State; M.S.M.E., 1987, Ph.D., 1989, Washington State.

*MOSELLE W. ANDERSON, 1967 (1977), Extension Professor Emerita; B.A., 1967, Idaho State. Emerita since 1977 (now residing in Pocatello).

RAMONA L. ANDERSON, 1987, Lecturer in Business; M.B.A., 1975, Illinois.

THOMAS H. ANDERSON, 1989, Professor of Naval Science; Department Head, 1989-; B.S., 1961, Southern California.

*GRAHAM ANDREWS, 1987, Affiliate Assistant Professor of Chemical Engineering, Idaho Falls; B.S., 1969, Imperial College (London); M.S., 1975, Ph.D., 1979, Syracuse.

*CHARLES A. AQUILINA, 1986, Affiliate Professor of Computer Science, Idaho Falls; B.S., 1971, Colorado State; M.B.A., 1976, Xavier.

AHMED A. ARAJI, 1968 (1977), Professor of Agricultural Economics (production economics); Agricultural Economist; B.Sc., 1962, M.Sc., 1964, Nebraska; Ph.D., 1968, Missouri.

*ELDON D. ARCHAMBAULT, 1971, Professor Emeritus of Education; B.A., 1945, Northern Iowa; M.A., 1948, Ph.D., 1967, Iowa. Emeritus since 1983 (now residing in Port Angeles, Wash.).

*WILLIAM B. ARDREY, 1939 (1945), Professor of Veterinary Science and Veterinary Microbiologist Emeritus; B.S., 1934, Monmouth; M.S., 1936, Ph.D., 1939, Michigan State. Emeritus since 1974 (now residing in Bandon, Oreg.).

*JILL E. ARMSTRONG, 1989, Affiliate Assistant Professor of Home Economics, Pullman, Wash.; B.S., 1978, M.S., 1981, North Carolina State; Ph.D., 1985, Rhode Island.

TERRY R. ARMSTRONG, 1969 (1975), Professor of Education (Coordinator of Student Services and Executive Assistant to the President, 1978-89); B.S., 1958, Southern Mississippi; M.Nat.Sc., 1964, Ed.D., 1969, Idaho.

*JAMES R. ARTHURS, 1981, Affiliate Clinical Professor of Medical Science, Coeur d'Alene; B.S., 1964, Washington State; M.D., 1968, Washington.

*ROGER O. ASHLEY, 1990, Associate Extension Professor of Agriculture; Bonneville County Extension Agricultural Agent, Idaho Falls; B.S., 1975, Michigan State; M.S., 1989, Arizona.

EVELYN ASHTON-JONES, 1989, Assistant Professor of English; B.A., 1976, Western Illinois; M.A., 1983, Ph.D., 1989, South Florida (Tampa).

DAVID H. ATKINSON, 1989, Assistant Professor of Electrical Engineering; B.A., 1977, Whitman; B.S.E.E., 1980, Washington State; M.S., 1981, Stanford; Ph.D., 1989, Washington State.

*NANCY I. ATKINSON, 1943 (1972), Catalog Librarian Emerita with rank of Professor (Head, Catalog Department, 1943-72); A.B., 1935, A.B.L.S., 1936, Michigan. Emerita since 1972 (now residing in Moscow).

ROY ALDEN ATWOOD, 1984 (1987), Associate Professor of Communication; B.A., 1975, Dordt; M.A., 1977, Westminster Theological Seminary; Ph.D., 1984, Iowa.

JORG A. L. AUGUSTIN, 1968 (1978), Research Professor of Food Science and Biochemistry; Diplomierter Ingenieur Agronom, 1955, Eidgenoessische Technische Hochschule, Zurich; M.S., 1957, Illinois; Ph.D., 1964, Michigan State.

DICK L. AULD, 1976 (1986), Professor of Plant Breeding and Genetics; B.S., 1970, M.S., 1973, New Mexico State; Ph.D., 1976, Montana State.

*ROBERT C. AVERETT, 1977, Affiliate Professor of Fishery Resources, U.S. Geological Survey, Denver, Colo.; B.S., 1957, Oregon State; M.S., 1963, Idaho; Ph.D., 1965, Washington (Seattle); Ph.D., 1968, Oregon State.

JASPER R. AVERY, 1959 (1962), Assistant Professor of Mechanical Engineering; B.S.M.E., 1957, Idaho; P.E.

*JOHN M. AYERS, JR., 1977, Affiliate Clinical Professor of Medical Science, Moscow; B.A., 1966, Idaho; M.D., 1970, Washington (Seattle).

J. FRANKLIN BAILEY, 1984 (1985), Supervisor, Electron Microscopy Center; Adjunct Instructor in Veterinary Science; B.S., 1968, M.S., 1971, Texas A & M.

*JAMES W. BAILEY, 1953 (1972), Professor Emeritus of Veterinary Science; B.Ed., 1935, Western Illinois State Teachers; D.V.M., 1943, Texas A & M. Emeritus since 1972 (now residing in Caldwell).

*EVERETT M. BAILY, 1978, Affiliate Professor of Electrical Engineering, Hewlett-Packard Co., Boise; B.S.E.E., 1961, M.S.E.E., 1964, Idaho; Ph.D., 1968, Stanford.

*CRAIG R. BAIRD, 1974 (1984), Extension Professor of Entomology, Parma; B.S., 1967, M.S., 1970, Utah State; Ph.D., 1973, Washington State.

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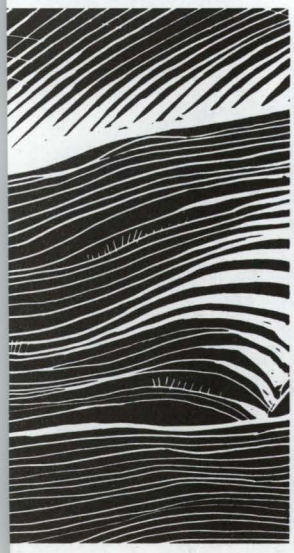

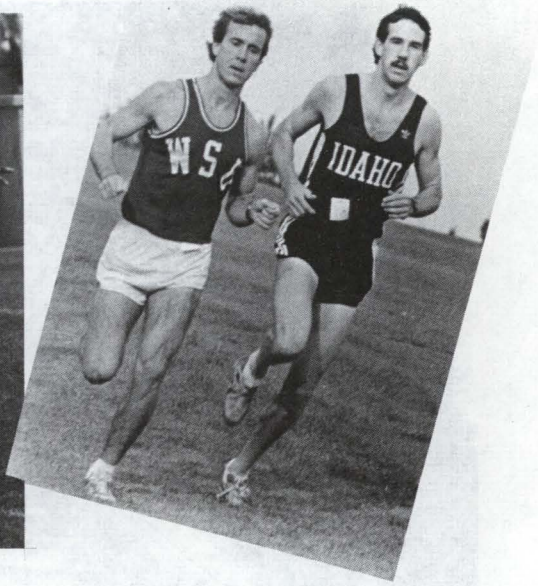
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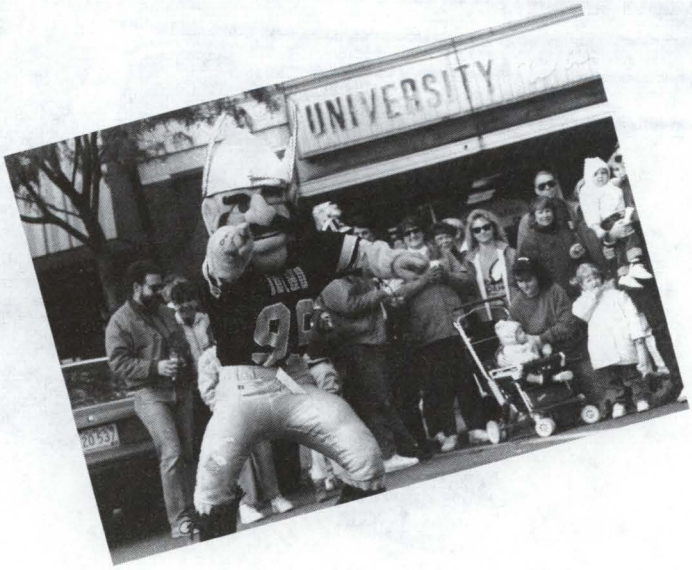
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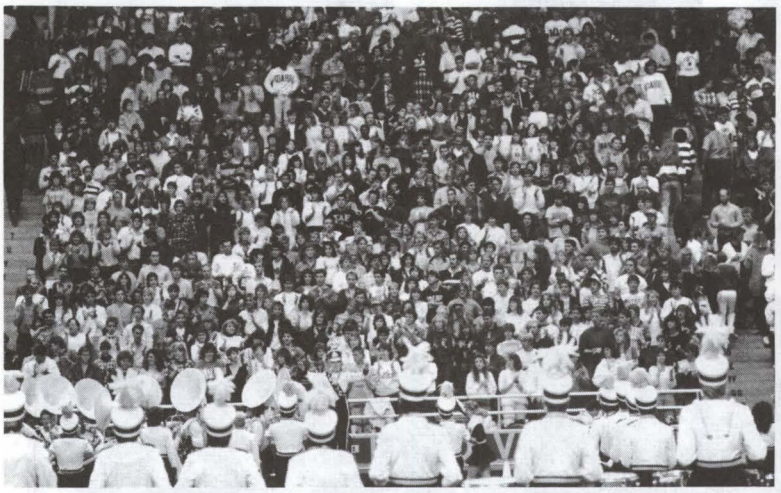

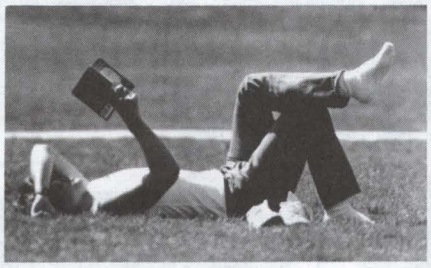

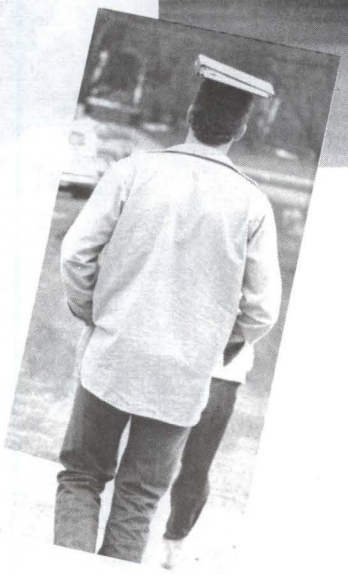


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