# Academic Calendar

## First Semester

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<tr>
<th>Event</th>
<th>1983-84</th>
<th>1984-85</th>
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<tbody>
<tr>
<td>Registration, Thursday and Friday</td>
<td>Sept. 15-16</td>
<td>Aug. 23-24</td>
</tr>
<tr>
<td>Classes begin, Monday</td>
<td>Sept. 19</td>
<td>Aug. 27</td>
</tr>
<tr>
<td>Midsemester grades due in Registrar's Office, 8:00 a.m., Friday</td>
<td>Nov. 4</td>
<td>Oct. 12</td>
</tr>
<tr>
<td>Thanksgiving vacation begins, 12:00 noon, Saturday</td>
<td>Nov. 19</td>
<td>Nov. 17</td>
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<tr>
<td>Thanksgiving vacation ends, 8:00 a.m., Monday</td>
<td>Nov. 28</td>
<td>Nov. 26</td>
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<tr>
<td>Christmas vacation begins, 12:00 noon, Saturday</td>
<td>Dec. 17</td>
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<tr>
<td>Christmas vacation ends, 8:00 a.m., Tuesday</td>
<td>Jan. 3</td>
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<tr>
<td>Final examinations, Saturday through Friday</td>
<td>Jan. 21-27</td>
<td>Dec. 15-21</td>
</tr>
<tr>
<td>Final grades due in Registrar's Office</td>
<td>Jan. 30 (8 am)</td>
<td>Dec. 26 (4 pm)</td>
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## Second Semester

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<tr>
<th>Event</th>
<th>1983-84</th>
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<tbody>
<tr>
<td>Registration, Thursday and Friday</td>
<td>Feb. 2-3</td>
<td>Jan. 10-11</td>
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<tr>
<td>Classes begin, Monday</td>
<td>Feb. 6</td>
<td>Jan. 14</td>
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<tr>
<td>Midsemester grades due in Registrar's Office, 8:00 a.m., Friday</td>
<td>Mar. 23</td>
<td>Mar. 1</td>
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<tr>
<td>Spring vacation begins, 12:00 noon, Saturday</td>
<td>Mar. 31</td>
<td>Mar. 9</td>
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<tr>
<td>Spring vacation ends, 8:00 a.m., Monday</td>
<td>April 9</td>
<td>Mar. 18</td>
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<tr>
<td>Final examinations, Saturday through Friday</td>
<td>May 26-June 1</td>
<td>May 4-10</td>
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<tr>
<td>Commencement</td>
<td>June 2 (10 am)</td>
<td>May 12 (1 pm)</td>
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<tr>
<td>Final grades due in Registrar's Office, 8:00 a.m., Monday</td>
<td>June 4</td>
<td>May 13</td>
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## Summer Session

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<tr>
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<tr>
<td>Registration, Monday</td>
<td>June 11</td>
<td>June 10</td>
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<tr>
<td>Classes begin, Tuesday</td>
<td>June 12</td>
<td>June 11</td>
</tr>
<tr>
<td>Independence Day (a holiday)</td>
<td>July 4 (Wed.)</td>
<td>July 4 (Thurs)</td>
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<tr>
<td>Six-week session ends, Friday</td>
<td>July 20</td>
<td>July 19</td>
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<tr>
<td>Eight-week session ends, Friday</td>
<td>August 3</td>
<td>August 2</td>
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<tr>
<td>Final grades due in Registrar's Office, 8:00 a.m., Monday</td>
<td>August 6</td>
<td>August 5</td>
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<tr>
<td>Month</td>
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The Board of Regents

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Governor of the State of Washington
Advisory Member Ex Officio

Dr. Diptiman Chakravarti, President
Seattle

Mr. Edwin J. McWilliams, Vice President
Spokane

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Edwall

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(Appointed)
Pullman

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Albert C. Yates, PhD
Academic Vice President and Provost

G. A. Hartford, Jr., MS
Vice President-Business and Finance

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Vice President for University Relations

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Associate Provost for Instruction

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Dean of Students

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Associate Provost for Research and Dean of the Graduate School

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Dean, College of Agriculture and Home Economics

C. James Quann, EdD
Registrar and Editor, University Catalog

V. Lane Rawlins, PhD
Associate Provost for Administration

Allene F. Schnaitter, PhD
Director of Libraries

Larry M. Simonsmeier, JD
Dean, College of Pharmacy
Washington State University

Washington State University is dedicated to the preparation of students for productive professional careers, to basic and applied research in a variety of areas, and to the dissemination of knowledge to the general community. The university consists of seven colleges, a graduate school, an Intercollegiate Center for Nursing Education, and the Seattle Center for Hotel and Restaurant Administration. WSU offers more than 90 major fields of study to undergraduate students. The bachelor's degree is available in all major areas of study and the master and doctoral degrees are available in most subject areas. This catalog contains a complete list of departmental requirements and degrees awarded.

The university provides a variety of educational opportunities, including study in the traditional liberal arts and professional training in subject areas such as agriculture, architecture, business administration, education, engineering, fine arts, home economics, nursing, pharmacy, radio and television, and veterinary medicine. The honors program is one of the few all-university programs for superior students at a major American institution of learning. In recent years programs in environmental science, Asian American studies, Black studies, Chicano studies, speech pathology, and women studies, as well as doctoral studies in engineering science and literary studies, have been initiated. The student body of Washington State University is composed of over 14,500 undergraduate and approximately 2,000 graduate full-time students.

Students at Washington State University come from every part of the state, from all sections of the country, and from Europe, Asia, South America, and Africa. The faculty includes a substantial number of scholars with noteworthy reputations in their areas of specialization.

Accreditation

Washington State University is accredited by the Northwest Association of Secondary and Higher Schools, the regional accrediting association.

The institution is a member of the National University Extension Association and is listed in the official publications of the U.S. Office of Education and the State Department of Public Instruction.

Several departments and colleges are accredited by professional accrediting associations recognized by the National Commission on Accrediting. This information is included in the introductory material of the various departments and colleges.

The Campus

Washington State University is located at Pullman in the southeastern part of the state. In addition to the main campus, the university maintains thousands of acres of farmland and agricultural research centers at various locations throughout the state. Modern classroom buildings, special research and instructional equipment, student living accommodations, libraries, hospital facilities, auditoriums, gymnasiums, and administrative offices are located on campus and are easily accessible to students and visitors. In the last few years a number of important buildings have been constructed on campus. These include a performing arts coliseum, a biological sciences building, a science and engineering library, a computer science building and computing center, a communications building, a fine arts building including galleries, and a multi-story physical sciences building. The stadium has been expanded, and new track and field and baseball facilities were recently completed.

Many recreational facilities are located on campus. These include a nine-hole golf course, sixteen all-weather tennis courts, and Olympic-sized swimming pools. Special playing fields afford an opportunity for fall and spring outdoor intramural competition, and nearby hills are available for skiing, hiking, picnicking, and camping.

The Summer Session

Washington State University conducts an eight-week Summer Session for graduate, undergraduate, and visiting students as an integral part of its year-round operation. Credit earned during summer sessions may be applied toward fulfillment of requirements for baccalaureate and advanced degrees in the same manner and subject to the same rules as credit earned during semesters or regular academic years.
During the Summer Session, courses are offered in most university departments to meet the needs of new freshmen and transfer students who wish to get an early start on their degree programs. Courses in a variety of academic areas are offered for continuing undergraduate and graduate students as well as for others qualified to pursue them to advantage. Emphasis is also placed on a program of advanced work for teachers and school administrators. Shorter sessions varying from one to six weeks for regular courses, special conferences, and institutes are also features of the Summer Session.

The Summer Session Bulletin, published annually in January is available upon request to the Registrar, Washington State University. Application forms for both enrollment packs and housing with published deadline dates are included in the Summer Bulletin.

Continuing University Studies
The Office of Continuing University Studies (CUES) coordinates WSU off-campus classes, campus evening classes, and courses by correspondence. The office also assists academic departments in presenting noncredit classes, conferences, and workshops both on and off campus. Its mission is to extend the educational resources of the university to individuals and groups throughout the state. Most WSU courses can be offered for credit off campus.

Nontraditional modes of instruction, using broadcast and closed-circuit television, audio and video tapes, telephones, and other media in conjunction with off-campus or independent study, provide flexible learning alternatives for part-time students.

Off-Campus Classes are offered by academic departments and programs through the auspices of Continuing University Studies. Most of the courses are for upper-division or graduate credit. Some degrees are available off campus. Courses may begin at any time of the year and need not conform with the campus semester calendar.

Campus Evening Classes, offered each semester, include credit and noncredit courses, and short courses and workshops.

Courses by Correspondence are offered by 25 academic departments and programs. Many of the courses supplement written materials with slides or audio cassettes. Up to 25 percent of the credits for a baccalaureate degree may be taken from WSU by correspondence study.

Short Courses, Conferences, Workshops, and other noncredit educational programs are administered by Continuing University Studies in cooperation with another academic department or administrative unit. Continuing Education Units (CEU’s), a nationally recognized measure of noncredit educational activity, can be arranged for most programs.

Information on all programs may be obtained by contacting Continuing University Studies, Van Doren Hall 208; phone (509) 335-3557.

Student Clubs and Honoraries
Participation in departmental clubs and honoraries, service organizations, and campus activities is an important part of student life. More than three-fourths of the student body take part in the activities program. Adequate opportunities are available for every student to pursue extracurricular interests, through service, recreation, religious, and other specialized interest groups.

Scholastic Societies
Phi Beta Kappa, the oldest national honorary fraternity in the United States, was established to promote scholarship and friendship among students and graduates of American colleges and universities. New members are selected from the senior class based on scholarly achievement, character, and broad cultural interests. To be considered for selection, students must be majoring in a liberal arts discipline, have 75 per cent of their course work in liberal arts, and have earned 45 WSU credits with at least a 3.45
grade point average. Only about 15 percent of the institutions of higher education in the United States have programs sufficiently strong in the sciences and liberal arts to warrant membership. The WSU chapter of Phi Beta Kappa was founded in 1928.

Phi Kappa Phi, the first national scholastic society to recognize superior scholarship in all fields of study, was established in 1897. The WSU chapter was founded in 1919. Students from all disciplines within the university are eligible for membership. Candidates are selected from the upper ten per cent of the senior class and the top five per cent of the junior class each year. Graduate students are also eligible for membership. The central concern of the society is the bringing together of representatives from many different fields of interest to broaden the democratic base of all education.

**Student Government**

Undergraduate students at Washington State University are represented by 18 elected representatives who serve on the Associated Students of Washington State University (ASWSU) Assembly. ASWSU is interested in a wide range of issues relating to the student's life at WSU and is led by the student body president and vice president. The assembly is directly involved in the allocation of ASWSU funds for programming and the establishment of operating procedures. Through the assembly, ASWSU has developed a number of student committees and programs in the areas of education, entertainment, recreation, and spirit groups. The ASWSU President, Vice President and the 18 assembly members also serve on the University Senate.

Graduate and professional students are members of the Graduate and Professional Students Association (GPSA). Five members of the GPSA represent their constituents on the University Senate.

**Student Publications**

Student publications provide opportunities for students to express themselves, to serve the university community, and to gain experience in the production of a variety of printed self-supporting publications. The goal of each student publication is to provide information for students, staff, faculty, alumni, and other readers interested in Washington State University.

*The Daily Evergreen* is issued five times per week on campus during the nine months of the regular academic year. "The Summer Evergreen" is issued weekly during the eight-week summer session. *The Daily Evergreen* is one of the largest campus newspapers in the U.S.

*The Chinook* is the university yearbook issued each September to over 10,000 buyers. *The Chinook* is one of the top five university and college yearbooks in the U.S.

**Compton Union Building**

The Compton Union Building is the campus community center. More than a building, it is an educational program of out-of-class activities designed to provide for the student's personal, social, and cultural development; practice in leadership; and management and enjoyment of leisure activities.

The Union has facilities for student activities, conferences and conventions. Facilities include food services of all kinds, meeting rooms, a games area, crafts area, guest rooms for campus visitors, movie theater, copy center, lecture notes, outdoor rental shop, art gallery, legal services, lockers, and a variety of shops (called "Little Main Street") offering a U.S. Post Office, barber shop, bank, gift shop, travel service, credit union, floral shop, dry cleaning service, and film processing service.

ASWSU and the Activities/Recreation office coordinate and guide existing student organizations and assist new groups in developing sound programs. A professionally trained staff is prepared to help all students in planning well-balanced activity programs adapted to their particular needs and interests.

Other groups with office space include Associated Women Students, Residence Hall Association, Panhellenic/Interfraternity Council, Young Men's Christian Association, Women's Center and Sex Resource Center.
Communication Disorders Clinic
The Communication Disorders Clinic helps students to correct communication disorders involving defective articulation (such as lisping and defective sound production), stuttering, voice disorders (harshness, hoarseness, nasality, abnormal pitch), and speech and language problems resulting from brain injury or neuromuscular disability. The clinic tests hearing and provides hearing-aid evaluations, speech, language, lipreading, and auditory training for persons with hearing disabilities. Students with specific learning disabilities may also receive special help at the clinic. Application should be made to the Communication Disorders Clinic of the Department of Speech immediately after registration. There is no charge to students.

Physically Impaired Student Services
The Physically Impaired Student Services Program operates through the Office of Supportive Service Programs. This program plans for and coordinates services for students with physical impairments and permanent health problems, and works with other agencies within the university to increase accessibility and sensitivity to the needs of physically impaired students. The program includes direct and referral services to students.

Assistance and guidance are provided to students with various handicapping conditions such as visual, hearing, or mobility impairments, and learning disabilities.

General services include: early registration for classes; use of specialized equipment; assistance in obtaining tutors, volunteer notetakers, and readers; and specialized assistance for unique situations.

Other services available are: taping of textbooks and research material, assistance with campus orientation and mobility training; an interpreter for hearing impaired students; and an accessible van for transportation to and from classes for mobility impaired students.

For additional information on the availability of these services and equipment, contact the program center, 461 Holland Library, (509) 335-1565.

Science Supportive Services
Science Supportive Services (SSS) is an academic advisory program designed to assist students from academically and economically disadvantaged backgrounds who are interested in science careers. The program serves two broad areas—health science and general science. The health science component prepares students to enter the spectrum of health care-related professions and professional schools. The general science component serves students who are interested in such disciplines as agriculture, forestry, engineering, architecture, computer science, and other science disciplines. Outstanding features of the SSS are academic planning and counseling, tutorial services, summer and permanent placement, lecture notes, recommendations for professional schools, and special seminars and lectures. SSS is located in Van Doren Hall, Room 4.

Student Health Services
The Student Health Service is located in the same building as Pullman Memorial Hospital on the southern periphery of the campus. All students who pay full university fees are eligible for care at the Student Health Service and are also eligible to purchase a supplemental hospital-accident plan at a very reasonable cost. A Personal Medical History Form is to be completed by the student and returned to the Student Health Service prior to initial registration. The completion of this form does not necessitate a visit to your physician or a physical examination.

Appointments for clinic visits may be made by telephone (335-3575) or in person 8:00 a.m. to 5:00 p.m., Monday through Friday. In addition, the clinic is open for "sick calls" only from 9:00 a.m. to noon, Saturdays. Emergencies will be seen at any time.

As approved by the Student Assembly and the Board of Regents spring, 1982, a mandatory student health fee of $10 per semester will be charged to full-time paying students during the 1982-83 academic year, $20 per semester during the 1983-84 academic year, and $30 per semester during the 1984-85 academic year. Nominal charges may be made for supplies used in caring for patients. In addition, a fee is charged to patients coming in outside of regular clinic hours.
WSU Counseling Services
Counseling Services, located on the third floor of the Administration Annex Building, offers specialized individual and group counseling and testing services without charge to any regularly enrolled student. A staff of professionally trained counselors is available to provide confidential assistance on an individual basis to students with educational, vocational, personal, social or marital concerns. Group counseling and group workshops are provided to help students develop specific adjustment skills in areas such as stress reduction, assertiveness training, and other areas of personal development. Crisis services and consultation are also available on a 24 hour basis.

Counseling Services provide the university with a comprehensive testing program. National, state, and personal testing is available by appointment. In cooperation with the Career Services and Placement Center an up-to-date resource facility containing many occupational materials is maintained in the building for student use.

Counseling Office for Black Students
The Counseling Office for Black Students provides programs and services designed to address the cultural, social, academic, and personal needs and concerns of the university's Black students. Students are assisted with academic problems, financial aid, tutorial services, housing, work-study employment, and social and cultural adjustment to campus life and other concerns.

Chicano Student Counseling Office
Major services offered by the Chicano Student Counseling Office include academic advising, career and educational counseling, liaison with university offices and outside agencies, scholarship information, assistance in seeking and obtaining employment, and general information and referral services. The office recognizes the diversity of Chicano students, and seeks to assist them in realizing personal, academic, and career goals.

Native American Student Counseling Office
The Native American Student Counseling Office provides students with individual and group counseling, advisory services, academic assistance, and assistance with financial aid, housing and food services, and relations with Tribal and Bureau of Indian Affairs offices.

Re-entry Advisory Program
The Re-entry Advisory Program (RAP), located in Holland Library 461 (335-6816), has been organized in response to needs expressed by mature students, returning to school after an extended lapse in their education. The purpose of RAP is to provide assistance, information, support, and advocacy for re-entry students. Some of the areas for information and referral are admissions, registration, career advising, study skills, and adjustment to academic life. Student comments or suggestions are invited.

Office of Programs for Women
The Office of Programs for Women (OPW), located in the Holland Library Room 461, coordinates programming of issues relevant to women, acts in an advocacy role for women within the university, and provides services and resources to meet the special needs of all women. The Role Model Resource Bank and Re-entry Advisory Program are sponsored by this office.

The Women's Center, located in the Compton Union Building B-27, is a component of OPW and provides a place where students, staff, faculty, and community people can gather in a non-sexist environment to exchange ideas and information. Programs include a noon brown-bag series on such topics as career choices for women, women's health, family relationships, and current issues of concern to women.

Career Services
Individual career planning assistance, occupational outlook information and employer literature, seminars in job hunting techniques, and the option to establish a placement
file for eligible candidates are among the many services available at Career Services. Business, industry, government, and education regularly send representatives to campus for individual interviews with students and graduates. All services are available to alumni as well as on-campus students.

Career Services is located in the Administration Annex, Rooms 206, 203, and 107.

International Programs
The Office of International Programs administers and coordinates international programs undertaken by the university to strengthen its role in international affairs. Its functions may generally be described as follows:

Administration of participant training for overseas projects; administration of International Exchange Awards; administering student educational exchanges between Washington State University and foreign universities; acting as a clearinghouse for interested WSU staff and students on matters relating to study and teaching abroad, including Fulbright awards. The office works with and administers programs of foreign student sponsoring agencies such as African-American Institute (AAI), Latin American Scholarship Program of American Universities (LASPAU), Institute of International Education (IIE), Agency for International Development (AID), United States Department of Agriculture (USDA), and Food and Agriculture Organization of the U.N. (FAO).

Study Abroad Programs
Washington State University offers exchange programs with University College, Cardiff, Wales; Friedrich Wilhelms University, Bonn, Germany; Linköping University and Lund University, Sweden; Nihon University, Toyko, and Kansai University of Foreign Studies, Osaka, Japan; St. Stephens College, India; Tamkang University, Taiwan; and University of Stirling, Scotland. In addition, the university offers study abroad programs at the University of Copenhagen, Denmark. Students majoring in foreign languages may select a program of study in Rennes, Caen, or Cadiz through the Council on International Educational Exchange (CIEE). Washington State University is also a member of the Northwest Interinstitutional Council for Study Abroad (NICSA), a consortium which offers programs in London, Avignon, and Cologne. As an Associate Institution in the Institute of European Studies, the university also offers programs in Great Britain, Germany, Spain, France, and Austria.

Concerts and Recitals
The Music Department presents a varied program of hundreds of concerts, recitals, workshops, and master classes each year. These presentations given by faculty, students, ensembles, and visiting artists are listed in a monthly calendar of events which is available from the Kimbrough Music Office on request.

Music Performance Groups
The university supports several performance organizations with enrollment open to the general university student by audition. Students interested in enhancing their musical experience through participation in one of the orchestras, bands, jazz ensembles, choral groups, small ensembles, or music theatre productions are encouraged to contact the Music Office for further information.

University Theatre
The University Theatre presents a widely varied year-round program offering many opportunities for participation: eight productions in Daggy Hall theatres, a seven-week summer repertory season, theatre for children and young people, and many experimental and student-directed productions. Interested students should contact the Director of University Theatre in the Department of Speech for information regarding any aspect of the program—performance, technical, or management. Auditions are open to all members of the university community.
University Honors Programs

The Honors Program at Washington State University provides a broad and comprehensive intellectual experience. In addition to intensive specialization in their chosen fields of study, those enrolling in the program acquire an appreciative understanding of the natural and social sciences, of the arts, of language and literature, and of the historical and philosophical development of the cultures of the world. The aim of the program is to promote genuine intellectual curiosity which will abide long after the student has graduated.

Approximately 600 students are enrolled in the Honors Program at Washington State. They are from all departments and colleges of the university, from agriculture and from zoology, from engineering and from English, from fine arts and from economics. In every case the student is pursuing work in a major department in preparation for a professional career. In addition, special Honors courses are required of all those enrolled in the program.

Honors courses often correspond to the usual undergraduate courses but with important differences. The Honors Program is not an accelerated program; it tends to enrich rather than to accelerate the learning process. Most Honors classes are small, and students establish a close intellectual relationship with their instructors.

Admission to the Honors Program

Each year approximately 10 per cent of the entering freshman class is invited to join the Honors Program. Freshmen are selected on the basis of high school grade point averages, scores from college and pre-college testing programs, and information obtained from the student and high school advisers. Eligible students will receive letters inviting them to consider the Honors Program during the spring or summer preceding their freshman year. Those who do not receive such letters but are anxious to investigate the possibility of participating in the program should contact the Honors Center, Washington State University, for information.

The eligibility of transfer and foreign students is judged in each individual case on the basis of the student’s knowledge and competence in the work which has been done elsewhere. Such students ordinarily are not considered for admission to the Honors Program after the beginning of their junior year.

Students who are not admitted in the initial selection may petition to enter the Honors Program at any time after the end of their first semester but not later than the end of their sophomore year. To continue participation in the Honors Program a student must maintain an overall B average (3.00) and must maintain the same average in Honors work. Students in the Honors Program are not required to complete the General University Requirements for Graduation.

The Libraries

Washington State University Libraries are an integral part of the educational facilities of the institution. A collection of nearly three million items includes approximately 1.3 million bound volumes and thousands of pamphlets, maps, charts, microfilms, art prints, and photographs. More than 20,000 magazines, technical journals, periodicals, and newspapers are regularly received. The libraries are a depository for most United States Government documents and receive many municipal and state documents, plus documents from foreign countries, and most of the publications of the United Nations.

Books are shelved on open stacks, and current periodicals are arranged in convenient browsing areas. Quiet study areas are available, including a limited number of carrels for graduate students and others engaged in research. Reference librarians offer personal assistance to patrons in the library, using modern methods of information retrieval. Programs to support teaching, research, and public service include library-use instruction; computerized information systems connected with nationwide networks; interlibrary cooperation to make most published works available locally if needed.

Holland Library building houses collections in humanities and social sciences. Manuscripts, Archives, and Special Collections contain rich collections of primary resource materials—books, manuscripts, photographs—to support study and research in a number
of disciplines, including Pacific Northwest history, modern literature, regional publishing, veterinary history, agricultural history, Latin American history, fishing and angling, and others.

Instructional Media Services provides a comprehensive collection of materials, equipment, and services to obtain, design, produce, and display audiovisual materials, provide equipment repair, audio system design and engineering, all in support of university programs.

The Frances Owen Science and Engineering Library opened in 1977. A six-story structure with excellent facilities, convenient to most related departments, it is the largest and most technologically advanced science and engineering library in the Pacific Northwest.

The Agricultural Sciences Branch Library is in the renovated Johnson Annex near the College of Agriculture.

The Education Library, 130 Cleveland Hall, offers a wide range of materials and services to meet research and instructional needs in the various areas of education from preschool through community college adult education.

In 1981 the Veterinary Medical and Pharmacy collections merged and the combined collections are now located in the newly renovated Wegner Hall.

**Nuclear Radiation Center**

The Nuclear Radiation Center houses facilities for support of research on a university-wide basis. The facilities include a pool-type 1,000 kilowatt TRIGA-III fueled reactor, a 12,000 Curie cobalt-60 source, and associated advanced nuclear radiation detection equipment. The reactor power was increased to 1,000 kilowatts in 1987, with capability of pulsing to 1,500 megawatts.

Additional facilities available include a thermal column, beam ports, pneumatic transfer system for short-lived isotopes, isotope production tubus, and a 14 MeV neutron exposure facility. Equipment for use in experiments includes microprocessor bases multichannel analyzers, large volume Ge(Li) detectors, 5" x 5" Na(TI) detectors, ND6620 analyzer system, low energy photon detector-MCA system, dual parameter analyzer, fast and delayed coincidence equipment. The center houses a trace element laboratory that specializes in neutron activation analysis but includes also an atomic absorption unit. The center also has a coal-research laboratory using gas chromatography, gel permeation chromatography and high performance liquid chromatography. Trace element analyses are performed for other groups on the university campus.

**Radio-Television Services**

The Radio-Television Services operate three radio stations, one television station, and WSU Instructional Television (ITV).

KWSU-AM, a member of National Public Radio (NPR), is one of the nation's pioneer public radio stations. KFAE-FM, also an NPR member, signed on July 1, 1982 (KFAE were KWSU's original call letters when it began in 1922.) The station is programmed at KWSU but is rebroadcast from a Richland transmitter. Its signal reaches some 650,000 potential listeners in the inland northwest. KFAE/KWSU is one of the few Fine Arts Radio networks in the U.S. KUGR is a student-operated campus station. KWSU-TV, an affiliate of the Public Broadcasting Service (PBS), produces and broadcasts local and national programs. The ITV operation produces instructional materials for academic departments, provides viewing carrels and portable video equipment services, and programs Pullman cable Channel 8 and Spokane cable Channel 18. Students are used extensively on the working staff for both radio and television stations and in the ITV operation.

**Electron Microscopy Center**

The Electron Microscopy Center (EMC), located in Science Hall, is available for training and research in science and technology. Students, staff, and faculty members of WSU and other institutions have access to the facilities for training, consultation, and service work under flexible conditions designed to provide maximal use of the EMC.
Formal courses in electron microscopy, and undergraduate and graduate research (with or without credit) are offered by the center.

The EMC maintains three transmission electron microscopes (including an analytical TEM equipped with STEM, SEM, Diffraction, and EDX), a scanning electron microscope also with EDX, and a full complement of ancillary facilities and equipment. It has a skilled staff experienced in handling a wide range of research problems involving electron optics.

**Museums**

**Conner Museum**
The Charles R. Conner Museum, located in Science Hall, exhibits fishes, amphibians, reptiles, several hundred mounted birds and mammals, including deer, antelope, mountain sheep, mountain goat, cougar, and small species. The display collection is open to the public from 8:00 a.m. to 5:00 p.m. daily including weekends.

**The Museum of Art**
The Museum of Art was established in 1974 around a core collection of American paintings assembled by former President E. O. Holland and is dedicated to serving the educational purposes of WSU and the people of the state of Washington. The museum operates an eleven-month program embracing a wide variety of exhibitions ranging from antiquity to the contemporary, from design and architecture to sculpture and painting, both by regionally and nationally known artists, with the majority of exhibits being originated by the museum staff. Many of these exhibitions have gone on national tours. The museum sponsors an annual art symposium which brings to the campus noted figures in American art to discuss significant current trends and issues. The museum offers a wide variety of speakers and films, and special music and dance programs throughout the year.

The museum's collection of American 19th- and 20th-century paintings, drawings, and prints is exhibited in public areas throughout the campus as well as in the administrative offices of the university. Renewed emphasis has been placed on the collection, and it has grown in the past years through financial donations and important gifts from collectors and alumni in the Northwest. In 1975 the Museum of Art was a founding member of the Washington Art Consortium, a then-unique venture by four small museums to build a major national collection of works on paper by American artists. The museum's consortium activities have provided an added focus to its own collecting of additional works on paper from all eras represented in its collection.

The museum documents its major exhibitions with published catalogs, available in the museum's bookshop. The exhibition galleries of the Museum of Art are open and free to the public six days a week (and five days a week during the summer).

**Jewett Observatory and University Planetarium**
The James Richard Jewett Observatory is the gift of Mr. and Mrs. George F. Jewett of Spokane and is named in honor of Mr. Jewett's father, a former professor of ancient languages at Harvard University. The observatory houses a twelve-inch refractor with a visual lens and a twenty-five-foot revolving dome.

The University Planetarium is located in Room 231 of Sloan Hall. Information about open house and group tours of either the observatory or the planetarium can be obtained by contacting the Program in Astronomy.

**Social Research Center**
The Social Research Center has two primary missions: (1) to facilitate and administer research in the social sciences that is responsive to the needs and concerns of the local, state, and regional communities, and, (2) to provide research training for both undergraduate and graduate students in the social sciences. The clientele of the Social Research Center includes the students, faculty, and administration of Washington State University, and the citizens and agencies of the state. The center includes units on Aging, Criminal Justice, and Human Values. Research facilities include the Public Opinion
Laboratory and a Data Processing Center operated jointly with other departments. The professional-technical staff of the center provides assistance in all facets of the research enterprise.

Faculty and students from all social science disciplines may become involved in center projects. Physical and biological scientists and engineers increasingly require social science participation in their research, and the Social Research Center is an active participant in such projects. Cooperation with other research centers and departments in the university lends a strong interdisciplinary emphasis to the work of the center.

**Environmental Research Center**
The Environmental Research Center is an all-university research unit reporting to the Dean of the Graduate School. The center is the focal point for university development of interdisciplinary research on problems related to the environment. It provides an organizational and administrative structure to accommodate interdisciplinary environmental research projects which cut across departmental and college boundaries.

The center is closely integrated with the academic program in Environmental Science-Regional Planning, and students are encouraged to participate in the research projects carried out through it. In order to stimulate an awareness of environmental problems and contributions the university can make in solving them, the center acts as an information source for faculty and students of the university and for citizens of the state. It also assists in securing financial support for research projects involving faculty and students and acts as a liaison unit for interuniversity and other cooperative activities dealing with environmental matters. The Institute for Resource Management has been administratively developed through the center in close cooperation with the Program in Environmental Science and Regional Planning.

The center provides some direct support for graduate students and has sponsored a number of conferences and seminars on regional environmental problems.

**Computing Service Center**
The Computing Service Center provides an extensive offering of information processing services to the university community, as well as to a number of other governmental agencies and institutions in the Pacific Northwest. The primary resource for computing processing power is an Amdahl 470V/8 with 16 million bytes of main memory, over 18 billion bytes of on-line disk storage, 11 tape drives with 800-6250 bpi density, a tape library of more than 22,000 tapes, an IBM 6670 laser printer, a Compugraphics 8600 Phototypesetter, and a host of other peripheral devices. In addition to the Amdahl 470 installation, the center and other departments on campus provide to the faculty and students access to a number of minicomputers, microprocessors, and analog computing devices.

The center makes available to its users both interactive and batch computing support. The basic operating systems include: VM/MVS, CMS/Milton/Wylbur/Oryx, CICS, and ADABAS. Available through these systems are programmer utilities, compiler languages, modeling languages, statistical packages, mathematical subroutines, graphics programs, image analysis programs, text processing and word processing packages, and a myriad of other software products.

The majority of all university academic, research, and administrative computing is performed on the Amdahl 470. Access to this facility is via a network of local terminals and through the Center's I/O Dispatch Window. A number of public terminal laboratories are available to the university users. Users desiring information regarding the use of the resources available through the Computing Service Center are encouraged to stop by the Information Center in Martin Stadium Academic Center. At the Information Center users may subscribe to the Computing Center News, obtain copies of materials describing how to acquire computing accounts, and secure advice and materials on the particular services they are interested in using.

**Institute for Basic and Applied Energy Research**
The Institute for Basic and Applied Energy Research was established in January, 1981.
The institute is responsible for the promotion of research by various faculty groups having common energy-related interests in basic or applied research. The institute responds to the energy problems facing society by mobilizing highly trained faculty members into effective research teams, and disseminating the results of their research to campus and off-campus groups. A forum is also provided to help educate faculty, students, and the general public on current energy issues.

Center for Fundamental Energy Research

The Center for Fundamental Energy Research operates as a subunit of the Institute for Basic and Applied Energy Research. The faculty of the center consists of physical scientists engaged in basic research in photophysics; surface phenomena; metallic, polymeric, and crystalline materials; photovoltaic and thermophotovoltaic processes; homogenous catalysis; and photoconductive, magnetic, and electrooptical materials.

The center supplies research scientists with services, facilities, and equipment for shared use, and provides leadership in developing and organizing new research areas on campus. Several of the center’s faculty have attained international recognition through their research, and, consequently, the center attracts scientists from all over the world who come to Washington State University to learn and to contribute to the solution of energy problems.
General Information
Admission to Washington State University is granted without regard to age, sex, race, religion, color, creed, handicap, national or ethnic origin, or marital status.

The following information relates to admission of new students only. It is not applicable to students previously enrolled in Washington State University during the regular school year.

It is the policy of Washington State University to admit all applicants if the total evidence (academic records, test results, recommendations, and interviews) indicate a reasonable probability of success. The total number of new students admitted for any one semester or in any specific department or program will be based on the number of students for whom facilities can be made available.

Students who fail to meet the published admission requirements should contact the Director of Admissions for further information. Exceptions to the admission requirements may be made only by the Admissions Subcommittee.

Application forms are available in the high schools and the community colleges of Washington and the Office of Admissions.

The Faculty and the Board of Regents of Washington State University have adopted the following requirements for admission.

Freshman Admission Requirements
A resident of the state of Washington who has a 2.50 or higher grade point average in accredited high school work is eligible for admission. In some cases, special consideration will be given to an applicant with a grade point average below 2.50 on the basis of the total available evidence, including test results, recommendations, and interviews.

All eligible applicants will be considered for admission on the basis of accredited high school work completed through grade 11, such admission to be bona fide provided the applicant maintains a satisfactory record and completes high school graduation or its equivalent prior to the opening of the semester for which the student is admitted.

Students coming from outside the state of Washington will normally be admitted if they meet all of the above requirements. However, they may also be held to meet the requirements for admission to major institutions in their home state or province. While nonresident sons and daughters of WSU alumni will be considered for admission on the basis of resident requirements, they will be required to pay nonresident tuition and fees.

While no specific high school subject-matter pattern is required for entrance, the faculty strongly recommends that all prospective students complete no less than: 3 years of English; 2 years of Mathematics; 2 years of Natural Science and 3 years of Social Science. Students planning to enter the College of Sciences and Arts should complete two years of one foreign language. Additional specialized preparatory courses should be completed for students entering areas of study requiring special backgrounds.

Graduates of unaccredited high schools may be required to pass special validating examinations and should write to the Director of Admissions for further information.

Students applying for fall semester admission may submit the application at any time after December 1. Preference will be given freshman applications received by May 1. Applications for spring-semester admission are accepted from October 15 to January 15. A complete application includes the application form, an official high school transcript, the Washington Pre-College Test Data Sheet, and a $15 nonrefundable application fee.

The Washington Pre-College Test, while used primarily for advising and counseling, should be presented as a part of the total application by all students who have taken the test. Washington high school students should take the test when it is given in their high school. Out-of-state students will take the test on campus prior to registration.

Retention of Students
The grade point average for freshmen entering from high school in the fall semester 1981 was 3.21. Of the 2543 freshmen who entered in the fall semester 1981 from the
state of Washington, 2213 were enrolled in the spring of 1982, and 1795 were eligible to continue their enrollment in the fall semester of 1982.

**Transfer Admission Requirements**

Transfer students will normally be admitted if they show evidence of a 2.00 (C) or higher grade point average in transferable work completed in accredited post-secondary institutions. Transfer students should contact the Office of Admissions for information about special requirements.

Transfer applicants with less than 24 semester (36 quarter) hours of transferable credit will be considered for admission if they meet both freshman and transfer admission requirements. Applicants with 24 or more semester (36 quarter) hours of transferable credit will be considered for admission on the basis of the college record alone.

College-level work completed in accredited higher institutions is given appropriate credit upon transfer to Washington State University but shall not be granted for more than the number of years for which the institution is accredited. The maximum transfer credit allowed from accredited two-year community junior colleges shall be 60 semester (90 quarter) hours toward a baccalaureate degree irrespective of when those hours were earned. The maximum allowable credit toward a four-year degree shall be 90 semester (135 quarter) hours. For a five-year degree program the maximum credit allowed for transfer is 120 semester (180 quarter) hours.

Students who have completed an approved Associate of Arts or Associate of Science degree at a Washington community college including a course pattern which approximates the General University Requirements (GURs) for Graduation of Washington State University, as determined by the WSU Office of Admissions, will be considered to have fulfilled the General University Requirements. However, the additional requirements of the College of Sciences and Arts must in all cases be completed by comparable course work. For students majoring in the College of Sciences and Arts, additional requirements are described on page 32 of this catalog.

Transfer students applying for fall-semester admission may submit the application at any time after December 1. Preference will be given to transfer applications received by July 1. Applications for spring-semester admission are accepted from October 15 to January 15. A complete application includes the application form, an official transcript from each college or university attended showing work completed at the time of application, and a $15 nonrefundable application fee. Final and complete transcripts must be submitted prior to the student’s initial enrollment.

**Limited Enrollment Programs**

Since academic departments may establish additional requirements for admission to specific programs, eligibility for admission to Washington State University does not insure acceptance into any department or program as a certified major and degree candidate. Several academic programs including architecture, business administration, communications, computer science, construction management, economics, engineering, hotel administration, interior design, landscape architecture, nursing, pharmacy, and veterinary medicine are unable to accept all interested students. In these situations, and others which may arise in the future, the most highly qualified students will be selected up to the enrollment limits in the specific programs. Students applying for admission to selective admissions programs should contact the Office of Admissions regarding special requirements and application deadlines. For instance, applicants for veterinary medicine must apply by December 1; nursing, architecture, and pharmacy by March 1; and engineering by April 15. Deadlines may be changed at any time.

**Foreign Student Admission Requirements**

Washington State University encourages the application of qualified students from other nations to complement its cosmopolitan student community. However, because of limited supporting services, the university may from time to time find it necessary to limit the total number of foreign students, students from any single country, or students desiring any specific academic program. Applicants must submit official copies of all academic
records, the Test of English as a Foreign Language (TOEFL) scores, and evidence of adequate financial resources to meet the costs of the proposed study. Each application is carefully considered on its individual merits.

Selection of a Major

Students seeking a university degree must organize their efforts in a particular department or group of related courses. This is the student's major which should be selected early. Some academic majors have specific requirements which must be met before a student is allowed to certify a major. These requirements are listed in the department section of this catalog.

If an entering freshman knows with reasonable certainty what the major interest is to be, that interest may be specified on application for admission. Students may, if they choose, defer this selection until, but not beyond, the end of the sophomore year. Each freshman is assigned an adviser in the major interest area by the Coordinator of the Curriculum Advisory Program. This adviser can be changed if the student's original interest should change. Students unable to specify a major interest area will be assigned to a general adviser.

Students who have met departmental certification requirements may be eligible to certify a major after the completion of the freshman year (30 semester hours). The chairperson of the major department then becomes the adviser of record.

Students with advanced standing who transfer more than 30 semester hours normally are certified as departmental majors unless they are uncertain about their major or have not met departmental certification requirements. Transfer students who are not certified to a major are assigned to advisers in their area of interest by the Curriculum Advisory Program.

Students interested in completing a minor or second major should consult the department concerned. Formal certification of a minor or second major is completed after the student has finished 90 semester hours. Approved minors are identified in the departmental section of this catalog.

Graduate Admission Requirements

Applicants for admission to the Graduate School must meet the special requirements of the Graduate School and the particular program desired. For complete information, refer to page 56 of this catalog.

Former Students Returning—Not Enrolled the Previous Semester

Students formerly enrolled at Washington State University and who wish to return must submit an application for reenrollment. Preference will be given to applications received by August 1 for fall semester and January 15 for spring semester.

Former students returning whose previous academic record at Washington State University is unsatisfactory will be required to follow established academic reinstatement procedures prior to reenrollment.

Former students returning who have attended other institutions since last enrollment at Washington State University must submit an official transcript from each institution attended. Applicants will normally be required to have at least a 2.00 (C) grade point average in all such work.

Requests for reenrollment information and applications should be made to the Office of Admissions.

Advance Payment on Tuition and Fees

All undergraduate applicants, including former students returning, except special students, contract students, and foreign students (other than Canadians) living outside the U.S.A., are required to submit a nonrefundable advance payment on tuition and fees in the amount of $50.00 prior to final admission. The advance payment will be requested of those applicants who are eligible for admission and should not be submitted until notice of eligibility is received by the applicant. The payment should be sent directly to the Controller not later than May 1 for freshmen or July 1 for transfers seeking admission for the fall semester. The payment deadline is January 15 for spring-semester applicants.
Credit by Examination

Recognizing the natural ability and educational experience of many of its applicants, Washington State University has developed a broad program of credit by examination. Credit and placement may be granted for students who submit scores of three or higher on College Board Advanced Placement Examinations (AP). The College Board College Level Examination Program (CLEP) may also yield credit. Up to six semester hours of credit for CLEP general examinations is available for the humanities and arts, social science, and science general examinations passed at or above a standard score of 480. Subject examinations of CLEP yield variable credit as determined by the appropriate academic departments. Some academic departments use national examinations, the results of the Washington Pre-College Test, and departmental examinations in considering students for advanced placement and credit.

Students who want specific and complete information should write to the Office of Admissions.

Matriculated students currently registered may take a special examination for university credit in a course in which they are not registered. Such credits yield no grade points but may yield credit toward completion of General University Requirements for Graduation. For further information contact the Registrar or see Academic Regulations printed in the Fall Time Schedule.
General Regulations

Washington State University and its various colleges reserve the right to change the rules regulating admission to, instruction in, and graduation from Washington State University and any other regulations affecting the student body. Such regulations shall go into effect whenever the proper authorities may determine and shall apply to prospective students and to those who may at that time be enrolled.

Registration

Instructions for registration and procedures for dropping and adding classes are included in the Time Schedule and Catalog Supplement. These bulletins are available at registration or in the Registrar's Office. Registration is held just prior to the start of each term. Student class schedules and fee statements are distributed the day before classes start for the fall and spring semesters. Students have one week to pay tuition and fees. Summer session fees must be paid at the time of registration.

Student Identification Cards

Student identification cards are required for library privileges, admission to athletic events, campus activities, and general university use. Every student, both graduate and undergraduate, will be issued an identification card at the time of the initial enrollment. Identification cards are validated each semester during registration.

Withdrawal from the University

Students wishing to withdraw from the university must do so during the first five days of the semester to avoid further financial obligation. Withdrawals from the university are initiated through the Office of the Dean of Students.

Dropping All Courses

A student who decides to drop all courses before the term in progress is completed must withdraw from the university. The student initiates the withdrawal procedure through the Office of the Dean of Students.

Credit

Washington State University operates on the semester calendar. Each semester is of 15 weeks duration plus one week of final examinations.

A semester hour is ordinarily defined as (1) lecture—one contact hour per week for each 1 hour credit (2 hours outside preparation implied), (2) studio—two contact hours per week for each 1 hour credit (1 hour outside preparation implied), or (3) laboratory or independent study—three contact hours per week for each 1 hour credit, each for the duration of the semester. The proportion of time in each course assigned to lecture, studio, laboratory, or independent study is recommended by the faculty of the department offering the course. The term "semester hour" corresponds with "credit," "hour," or "credit hour" and is abbreviated to "hour" in the description of courses in this catalog.

Auditing

No university credit will be allowed for auditing courses. To visit a class more than three times requires an audit card which must be obtained from the Registrar. The written permission of the adviser and the instructor is required. Ordinarily audit cards will be issued only for lecture courses or the lecture portion of laboratory courses. An audit fee is charged for other than regularly enrolled full-fee-paying students.

Credit Hour Requirements for Full-Time Enrollment

The normal load for an undergraduate student is 15 credit hours per semester. Twelve credit hours per semester is considered a full load for undergraduate and graduate students. (Eight hours in the eight-week summer session is full time for both undergrad-
uate and graduate students.) Part-time students do not share in certain student body privileges such as participation in recognized activities, Student Health Services, and Student Publications. Graduate students on half-time teaching or research assistantships are expected to carry 10-14 credits per semester with no more than 12 hours of graded credit (3-6 in the eight-week summer session). The Graduate School Policies and Procedures Manual explains in detail the requirements for graduate students on appointment or taking examinations.

**Tuition and Fees:** Are based on credit hour enrollment. See page 37 of this catalog.

**Financial Aids:** For financial-aid purposes, full-time enrollment for an undergraduate student is 12 hours and half-time enrollment is considered to be 6 through 11 hours. For graduate students, full-time enrollment is 10 hours and half-time enrollment is considered to be 5 through 9 hours. Certain financial aid programs or policies such as State Need Grant and Tuition and Fee Waivers require a student to be enrolled full time.

**Loan Deferments:** Enrollment certifications for student loan deferments will be based on 12 semester hours (full time) for undergraduate and graduate students. (Ten semester hours will constitute full-time enrollment for a graduate student on a half-time assistantship.)

**Student Government:** In order to be qualified for election and tenure as a student member of the Senate, a candidate shall be a full-payee paying student and must be and remain in good academic standing.

**Veterans’ Benefits:** Requirements for Veterans’ Benefits under Public Law 358 (G.I. Bill), Public Law 634 (War Orphans Act), Public Law 815 (Disabled Veterans), and Chapter 32 (VEAP program) are 12 undergraduate or 8 graduate hours for full-time benefits. (During the 8-week summer session, 7 undergraduate or 4 graduate hours are considered full-time.) Detailed information on eligibility requirements may be obtained through the WSU Office of Veterans Affairs.

**Social Security:** Students eligible for monthly benefits under social security must be enrolled for at least 12 semester hours.

**Foreign Students Holding F-1 Visas:** The Immigration and Naturalization Service requires that nonimmigrant F-1 students be enrolled in a full course of study for the entire semester (12 semester hours for undergraduate students and 10-12 semester hours for graduate students per semester excluding summer session). Additional information on these requirements may be obtained from the Office of International Programs.

**Enrollment Limit**
The average semester credit load for undergraduate students is 15 credit hours. Students are not normally advised to enroll for more than 18 credit hours. When warranted, superior students may enroll for credits in excess of this limit. Students will not be allowed to enroll for 20 or more hours (10 hours for summer session) without written overload approval from their major department chairperson or CAP adviser. (See Tuition and Fees for additional credit hour charge over 18 hours.)

**Numbering System of Courses**

**Lower-division:**
- a) Courses numbered below 100 do not carry university credit.
- b) Courses numbered 100-199 inclusive are normally taken by freshmen.
- c) Courses numbered 200-299 inclusive are normally taken by sophomores.

**Upper-division:**
- d) Courses numbered 300-399 inclusive are normally taken by juniors and seniors.
- e) Courses numbered 400-499 inclusive are normally taken by juniors and seniors. These courses may be included in graduate programs provided they are published in the
Graduate Study Bulletin and provided they are not specific requirements in preparation for graduate study.

Graduate:

f) Courses numbered 500-599 inclusive are primarily for graduate students. Qualified seniors may take these courses for graduate credit during their last year or summer session. Other qualified seniors may (with permission of their department head) take these courses for undergraduate credit (see p. 57).

g) Courses numbered 600-800 have as a prerequisite regular student status in the Graduate School.

Course Prerequisites

When applicable, prerequisites are listed in this catalog with the specific course description, preceded by the abbreviation “prereq.” Prerequisites may be levels of competence or courses which a student must have completed or the standing a student must have achieved before enrolling for a specific course. For example, Calculus (Math 171) requires a prerequisite of Pre-calculus (Math 107), meaning that the student may not enroll for Calculus until successfully completing Math 107. Prerequisites may also be general as “one semester of chemistry or concurrent enrollment” (see Bio S 103; concurrent enrollment is indicated by the symbol c//). Prerequisites may include a level of expertise or a specified major, e.g., students may not enroll in Spanish 324 without first being fluent in Spanish, or students may not enroll in an advanced seminar before achieving senior standing in the major.

Questions concerning prerequisites should be referred to the instructor of the course. Students who have not met all prerequisites may be excluded from the course, or the instructor may waive the prerequisite based on demonstrated competence or equivalent academic experience.

Classification of Students

Undergraduate students who have completed less than 30 semester credits are classified as freshmen, 30-59½ semester credits as sophomores, 60-89½ semester credits as juniors, and 90 and above as seniors.

Graduate non-degree students are those who have received the baccalaureate degree but have not been admitted to the Graduate School. Sometimes called post-graduates, these students include those completing requirements for a second baccalaureate degree, those taking courses for personal enrichment, and those working toward teacher certification.

Graduate degree students are those admitted to a graduate program in a degree classification on the basis of a specific application to the Graduate School.

Certification of a Major

SPECIAL NOTE ON UNDERGRADUATE CERTIFICATION: Since academic departments may establish additional requirements for those seeking admission to specific programs, students are reminded that admission to Washington State University does not insure acceptance into any department or program as a certified major and degree candidate. Several academic programs including architecture, business, communications, computer science, construction management, economics, engineering, hotel administration, interior design, landscape architecture, nursing, pharmacy, and veterinary medicine are unable to accept all qualified students. In these situations, and others which may arise in the future, the most highly qualified students will be selected up to the enrollment limits in the specific program.
An undergraduate student may certify an academic major upon completion of 30 semester hours with the approval of the coordinator of the Curriculum Advisory Program and the department head. Some departments require more than the minimum 30 hours for certification and a g.p.a. higher than the minimum 2.00. Consult the departmental section of this Catalog for specific departmental requirements. A student who has completed 60 semester hours must certify a major as a condition to further enrollment.

A student may change majors from one department to another only on approval of the department heads concerned.

Minor or Second Major
A student who has completed 90 semester hours may certify a second major or a minor with the approval of the department concerned. The student should consult with the department concerning hours and grade point requirements and an approved schedule of studies to meet such requirements.

A second major requires completion of departmental and college requirements for the major exclusive of General University Requirements. A minor requires a minimum of 16 semester hours, half of which must be in upper-division course work. Upon completion of the requirements, the department will notify the Registrar, and the minor or second major will be posted on the student's permanent record (transcript). A list of approved minors is published in the Fall Time Schedule.

Grading System
Washington State University uses letter grades and the four point maximum grading scale. The grade A is the highest possible grade, and grades below D are considered failing. Plus (+) or minus (-) signs are used to indicate grades that fall above or below the letter grades, but grades of A+ and D− are not used. For purposes of calculating grade points and averages, the plus (+) is equal to .3 and the minus (−) to .7 (e.g., a grade of B+ is equivalent to 3.3 and A− is 3.7). A student's work is normally rated in accordance with the following definitions:

A—4 grade points per credit hour. To obtain this grade, the student must have shown uniformly the following qualities: (1) thorough comprehension and retention of both the facts and the principles of the subject; (2) ability to reproduce these facts and principles orally and in writing readily, accurately, and concisely; (3) power to correlate the material with other branches of the subject and with other subjects; (4) individual reaction to the material shown by ability to apply the methods of the course to new and original problems and situations with reasonably good results.

B—3 grade points per credit hour. The student so graded must have shown uniformly the first two qualities of the A grade without the third and fourth. Also, a B student is one who, during a considerable part of the course, but not uniformly, has shown all the qualities of an A grade student, but at times has shown neglect of prescribed tasks, not because of idleness but because of the pressure of other work or legitimate outside interests.

C—2 grade points per credit hour. A student doing average work or near average work will receive this grade. The work may frequently show thorough comprehension and accurate reproduction but is moderately irregular.

D—1 grade point per credit hour. This grade is for the student doing work considerably below the average. This work is barely passing.

F—no credit; 0 grade points (credits attempted are calculated in g.p.a.). Indicates a failure and is given to a student who does not show a satisfactory grasp of the subject and whose examinations and recitations are unsatisfactory.

S (Satisfactory)—no grade points; credit not calculated in g.p.a. Grade given upon satisfactory completion of courses numbered 499, 600, 700, 702, 800, Special Examinations (Rule 15) and other courses duly authorized for S, F grading by the University Senate. (Courses approved for S, F grading are footnoted in the Time Schedule.) S, A, or F
grades only are used to report physical education activity grades. Courses approved for S, F grading may also be graded S at midsemester indicating satisfactory progress.

P (Passing)—no grade points; credit not calculated in g.p.a. A satisfactory grade for a course taken under the Pass-Fail Grading Option (see p. 28). Instructors will turn in regular letter grades for all students enrolled in courses under the pass-fail option, but grades will appear on the student’s permanent record as P (Passing) or F (Failure).

I (Incomplete)—no credit or grade points. Used to indicate that a grade has been deferred. It is for students who for reasons beyond their control are unable to complete their work on time. The I grade for an undergraduate course taken either by an undergraduate or graduate student will be changed to an F if the work is not completed during the ensuing calendar year, or if the student repeats the course. Instructors are required to submit an Incomplete Grade Report with any grade form indicating an I.

W (Withdrawal Passing)—no credit or grade points. Used if the student has filed, in the Registrar’s Office, official notice of withdrawal from the course prior to the end of the eighth week, withdrew passing in accordance with Rule 69 or withdrew from the university prior to the last day of instruction.

X (grade withheld)—no credit or grade points. Denotes continuing progress toward completion of special problems, research, thesis, or doctoral dissertation, i.e., 499, 600, 700, 702, 800; X grades are converted to S upon satisfactory completion. An X grade may also be used when no final grade is reported due to instructor’s illness or absence from town.

**Grade Point Average**

The student’s grade point average (g.p.a.) is computed by dividing grade points earned by the number of credit hours attempted. Grades P and S do not carry grade points, and the credit hours are not calculated into the g.p.a. Credits attempted for F grades are calculated into the g.p.a. Transfer and other non-resident credit is not computed in the Washington State University grade point average. The following example illustrates computation of the g.p.a.:

<table>
<thead>
<tr>
<th>Course</th>
<th>credits</th>
<th>grade</th>
<th>grade points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 301</td>
<td>3</td>
<td>A</td>
<td>12.0</td>
</tr>
<tr>
<td>Bio S 305</td>
<td>3</td>
<td>C−</td>
<td>5.1</td>
</tr>
<tr>
<td>Soc 420</td>
<td>3</td>
<td>B+</td>
<td>9.9</td>
</tr>
<tr>
<td>Mus 490</td>
<td>2</td>
<td>P</td>
<td></td>
</tr>
<tr>
<td>Soc 499</td>
<td>4</td>
<td>S</td>
<td></td>
</tr>
<tr>
<td>Credit hours attempted (exclusive of P and S grades)</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total grade points earned</td>
<td>27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GPA</td>
<td>3.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total hours earned</td>
<td>15</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Courses taken by correspondence do not yield grade points and carry no graduate credit. Grades earned in Continuing University Studies courses sponsored by Washington State University yield grade points toward graduation. Correspondence or Continuing University Studies (extension) work submitted for transfer credit yields credit only if completed with grade of C or better.

**Grade Reports**

Midsemester grades are issued to freshmen students with less than 24 semester hours of credit and are mailed to the student’s local or school address. Final grade reports for all students are mailed to the student’s local or school address at the end of fall semester, and to the student’s permanent address at the end of spring semester. Only one grade slip will be produced.

**Transcripts**

An official copy of a student’s academic record at Washington State University that bears the official seal of the university and the signature of the Registrar is referred to as a
transcript. The transcript must include all work taken at Washington State University. Requests for transcripts must be accompanied by the student’s signature and a $2.00 fee per copy. Phone orders for transcripts cannot be accepted. NOTE: Financial indebtedness to the university will prevent the release of a student’s transcript.

Transcripts of secondary or higher education study that have been submitted to WSU as a requisite for admission cannot be returned to the student. Students desiring transcripts from other institutions must order official transcripts directly from the institution at which the work was taken. WSU does not issue or certify copies of transcripts from other institutions.

Repetition of Courses
Grades C and above and incompletes (I) may not be repeated. Grades of C– or below may be repeated. Students who wish to repeat a course will be eligible to enroll within the next two semesters, only if there is space available in the course.

With the student’s first three repeats, the last grade received shall stand as the course grade, and the last grade only shall count on the cumulative grade point average and contribute to the total number of hours required for graduation. If the student has additional repeats, the grade points will be averaged but the additional credits will not be counted. (The exact date for implementation of the grade averaging feature of this policy will be announced in the Fall Time Schedule.) In determining scholarship for graduation honors, the first grade only shall be used. For purpose of record, the series of repeats and grades will be retained on the student’s official record.

The student is required to indicate on the registration form all resident repeats. Students who fail to indicate a repeat on the registration form may be dropped from the course. Repeats by correspondence, extension, or from other institutions must be reported orally or in writing to the Registrar.

Courses Approved for Repeat Credit
Some courses are approved for repeat credit, i.e., more than one enrollment with credit accumulated (“May be repeated for credit”). However, students are limited to one enrollment per course in any one semester or summer session (one section of a multi-section course). Reenrollment must be during a subsequent semester or summer session.

Pass-Fail Grading Options
Separate pass-fail options are available for undergraduate and graduate students. During registration, students indicate on the Registration Form that they wish to enroll in the course on a pass-fail basis. The advisor’s approval and signature are required. Information indicating which students are enrolled on a pass-fail basis will not appear on class lists transmitted to instructors. Instructors turn in regular letter grades for all students, and the Registrar will change all grades of A through D to P for those enrolled pass-fail. The P (pass) grades earned by pass-fail enrollees will not be included in computing the g.p.a.; however, F grades earned by pass-fail enrollees will be included in g.p.a. computations. Courses approved under rule 90f are excluded from the pass-fail option. (Courses approved for S, F grading are footnoted in the Time Schedule.) Specific characteristics of the two options are as follows:

Undergraduate Pass-Fail Option: A total of six courses may be taken on a pass-fail basis by students initiating and completing work for a baccalaureate degree at Washington State University. No courses designed as meeting General University Requirements for Graduation may be taken pass-fail. No more than two courses may be taken on a pass-fail basis during any given semester. One course is the limit for summer session. An undergraduate may change a pass-fail enrollment to a regular letter-graded enrollment, or vice versa, during the first three weeks of classes. After the third week and through the last day of instruction in a semester (end of the fifteenth week), a pass-fail enrollment can be changed to a letter-graded enrollment. Students in the College of Veterinary Medicine with adviser approval may enroll for a total of six courses in the pro-
fessional curriculum on a pass-fail basis, subject to the regulations listed above. Allowances for transfer students are as follows:

<table>
<thead>
<tr>
<th>Transfer status upon entering WSU</th>
<th>Pass-fail allotments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-44½ credits</td>
<td>6 courses</td>
</tr>
<tr>
<td>45-59½ credits</td>
<td>5 courses</td>
</tr>
<tr>
<td>60-74½ credits</td>
<td>4 courses</td>
</tr>
<tr>
<td>75-89½ credits</td>
<td>3 courses</td>
</tr>
<tr>
<td>90 and above credits</td>
<td>2 courses</td>
</tr>
</tbody>
</table>

University Honors Program courses may be taken on a pass-fail basis only with the permission of the Honors Program Coordinator.

Departments and programs may deny their majors permission to take, on a pass-fail basis, courses in their major field or courses needed to meet departmental requirements.

Departments and programs may refuse to accept courses needed to meet the above requirements if the courses were completed on a pass-fail basis before the student was accepted into the department or program.

**Graduate Pass-Fail Option:** All graduate students in Class 5 or Class 6 are eligible, with adviser approval, to take courses on a pass-fail basis, but such work cannot be in the student’s official degree program or used for removal of a specific undergraduate deficiency. Credit hours earned under pass-fail are counted toward assistantship minimum hour requirements. Enrollment changes in pass-fail courses will be allowed with the adviser’s approval during the first three-week period following the beginning of classes. After the third week and through the last day of instruction in a semester (end of the fifteenth week), a pass-fail enrollment can be changed to a letter-graded enrollment. There is no limit on the number of hours a graduate student may take on a pass or fail basis.

**Honors**

**President’s Honor Roll.** An undergraduate student will be named to the President’s Honor Roll by achieving a grade point of 3.75 for at least 12 hours of graded work in a single semester, or achieving a cumulative grade point average of 3.50 based on at least 30 hours of graded work at Washington State University.

**Graduation Honors.** Candidates for baccalaureate degrees who have completed at least 30 hours of graded work (grades in which grade points are awarded) at Washington State University, will graduate summa cum laude if the cumulative grade point average for work completed at Washington State University is 3.80 or better, and will graduate cum laude if the minimum cumulative grade point average is 3.30 but less than 3.80. The appropriate Latin phrase will be printed on the diploma and on the final transcript. Qualified students electing to participate in the Honors Program who complete its requirements satisfactorily, regardless of whether they qualify to graduate summa cum laude or cum laude, will receive a certificate of completion and a printed notation on the final transcript. Computation of graduation honors will be done prior to the final semester to allow for publication of the appropriate honors in advance of graduation. However, following the student’s final semester, the Registrar will recompute the student’s g.p.a. including the last semester’s work, and only this computation will determine official graduation honors.

**Academic Complaint Procedure**

Students having complaints relative to instruction or grading should refer them first to the instructor, and if not resolved, then to the chairperson of the department in which the course is offered. The chairperson, if not able to resolve the problem to the student’s satisfaction, will refer the complaint, presumably with the chairperson’s written impressions, to the Dean of the College. The student is encouraged then to go directly to the Dean of the College. The Ombudsman, the Dean of Students, the Discriminatory Practices Committee, and the Academic Vice President and Provost are always available for any complaint not resolved to the student’s satisfaction.
Academic Deficiency

Undergraduate students are expected to maintain at least a 2.00 cumulative grade point average during their academic career at WSU. A student who falls below a 2.00 cumulative g.p.a. or who falls below a 2.00 semester g.p.a. for two consecutive semesters is considered academically deficient.

Students in the Curriculum Advisory Program who are deficient must apply to the Office of Academic Standing for reinstatement. For certified majors the Office of Academic Standing grants to the student’s academic department the decision on reinstatement. If denied reinstatement by the academic department, a student may appeal to the Office of Academic Standing for continued enrollment in another department.

A student who is deficient for two consecutive semesters is normally dropped. A student who feels there are important extenuating circumstances can appeal to the Office of Academic Standing. A student whose work is improving (semester g.p.a. of 2.00 or better), even though the cumulative g.p.a. is below a 2.00 for two semesters, is usually reinstated.

All students reinstated under any of the above provisions will be on academic probation and must abide by specific probationary conditions or be subject to denial of registration in succeeding semesters.

Student Access to Education Records

The WSU regulations implementing the Family Educational Rights and Privacy Act of 1974 accord to students certain rights and privileges regarding education records. The regulations have been adopted pursuant to the Higher Education Administrative Procedures Act and are published as Chapter 504-21 of the Washington Administrative Code. Pursuant to this Federal law, students are entitled to inspect their “educational records” maintained by university offices. The definition of “educational records” does not include materials used by any university instructor in the course of assessing a student’s academic performance, nor materials compiled by the university counseling or health centers.

The law provides students with the right to inspect and review information contained in their education records, to challenge the contents of their education records, to have a hearing if the outcome of the challenge is unsatisfactory, and to submit explanatory statements for inclusion in their files if they feel the decisions of the hearing panel to be unacceptable. Students may not inspect and review the following as outlined by the Act: financial information submitted by their parents; confidential letters and recommendations associated with admissions including admission to the Nursing Program or College of Veterinary Medicine, employment or job placement, or honors to which they have waived their rights of inspection and review; or education records containing information about more than one student, in which case the institution will permit access only to that part of the record which pertains to the inquiring student. Confidential letters and recommendations placed in the student’s file prior to January 1, 1975, are not open for inspection.

Students who believe that their education records contain information that is inaccurate or misleading, or is otherwise in violation of their privacy or other rights, may discuss their problems informally with the university employee or office having custody of the particular record. If the decisions are in agreement with a student’s request, the appropriate records will be amended. If not, the student will be notified within a reasonable period of time that the records will not be amended and he or she will be informed of his or her right to a formal hearing. Student requests for a formal hearing must be made in writing to the university employee or office having custody of the record in question. A student may present evidence relevant to the issues raised and may be assisted or represented at the hearings by one or more persons of his or her choice including attorneys, at the student’s expense. The Student Records Committee shall be responsible for reviewing all formal requests for information and for assisting in the interpretation of all regulations and policies that pertain to the Family Educational Rights and Privacy Act of 1974. The committee is also responsible for hearing appeals. The committee consists of the Registrar, a graduate student, an undergraduate student, two faculty members, and a representative of the Office of Student Affairs.
Students who believe that the adjudications of their challenges were unfair, or not in keeping with provisions of the Act, may request, in writing, review by the Academic Vice President and Provost. Further, students who believe that their rights have been abridged may file complaints with the Family Educational Rights and Privacy Act Office, Department of Health and Human Services, Washington, D.C. 20201. The complete text of this university policy is on file in the offices of the Registrar, Student Affairs, and University Relations, and is published in the Washington Administrative Code.

Requirements for Graduation
A student who has (a) completed any of the four-year collegiate curricula, (b) completed the General University Requirements for Graduation and any additional departmental or college requirements with a minimum 2.00 g.p.a. may become a candidate for the degree of Bachelor of Arts or the degree of Bachelor of Science, depending upon the field of study. Candidates must also present a minimum of 120 semester hours of credit for graduation for a four-year degree.

A minimum of 40 semester hours of credit in upper-division courses is required for a four-year degree.

A student desiring a second bachelor’s degree shall satisfy the second degree program and present not less than 150 semester hours of credit to receive the second degree (credits applied toward a graduate degree may not be used for a second baccalaureate degree).

A student who has completed any of the five-year curricula, has earned a minimum of 150 semester hours of credit, and has met the implied requirements in the paragraphs above may become a candidate for the bachelor’s degree in the field of study. Correspondence course credit is limited to not more than 25 percent of the total hours required for any undergraduate degree.

Students are required to do their senior work under the direction of the college in which the degree is to be granted. The degree granted and the schedule of studies for a given curriculum will be found in the material for the college or department concerned.

Students are required to earn a C average on all work taken at this institution. The student must also earn a C average in all major subjects. Any deficiency on transfer credit must be removed by work taken through Washington State University.

For otherwise qualified handicapped students, individual course requirements or specific requirements within courses may be waived. Waivers of departmental requirements must be approved by the major department. Waivers of specific requirements within courses must be approved by the department teaching the course. A request for waiver of a General University Requirement must be made directly to the Senior Petitions Committee and be approved by the student’s department chairperson and dean.

Catalog Options and Limitations
The graduation requirements of the university and its colleges as published in the Catalog in effect at the time of the student’s initial enrollment are those which must be met for completion of an undergraduate degree program. For transfer students, the initial enrollment date shall be that upon which the student entered postsecondary education. Subsequent changes in degree requirements, as published in the Catalog or amended by the University Senate, may be substituted at the option of the student.

Undergraduates who will not graduate within the normal degree time frame (e.g., four years for a four-year baccalaureate program and five years for a five-year program) plus two years must meet the requirements for graduation as published in the Catalog four years prior to the date of graduation.

Departmental requirements for graduation (including those in a college which does not have separate departmental requirements) are those in effect at the time the student initially certifies the major. Changes in departmental requirements after certification will apply provided they do not require a student to enroll in more than a normal complement of credit hours in any semester or do not prolong the time required to complete degree requirements. Department and program chairpersons have authority to waive or provide substitute course work for departmental requirements.
General University Requirements for Graduation

General University Requirements for Graduation have been established by the University Faculty in the belief that all students should devote a significant portion of their academic effort to general education. Students are encouraged to develop to the fullest their capacity for evaluating personal experience and for establishing a meaningful relationship to their natural and social environment. In addition, all educational development requires the ability to communicate effectively in both oral and written modes. Toward the attainment of these goals the faculty has established minimum requirements in the areas of Communication Proficiency, Arts and Humanities, Science and Social Science. They have identified a wide selection of specific courses which, both by their content and method of instruction, contribute to the development of communications skills and general educational experiences. These courses are offered at both the lower- and upper-division levels. Students should seek the help of their faculty adviser to adapt course choices to their individual needs and interests.

The General University Requirements constitute a minimum experience asked of all students. The College of Sciences and Arts requires that students go beyond that minimum experience as a condition of graduation in that college.

<table>
<thead>
<tr>
<th>General University Requirements for Graduation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts and Humanities [H]—6 hours</td>
</tr>
<tr>
<td>Social Sciences [S] or [U]—6 hours</td>
</tr>
<tr>
<td>Communication Proficiency [C]—6 hours including at least 3 in written communication [W]</td>
</tr>
<tr>
<td>Sciences [B], [P], [U], [Z]—10 hours including 1 credit for 3 clock hours of laboratory</td>
</tr>
<tr>
<td>Upper Division (300-400-level)—40 semester hours</td>
</tr>
<tr>
<td>Hours and grade points—a minimum of 120 semester hours with a grade point average of 2.0 or better</td>
</tr>
<tr>
<td>No designated GUR course can be taken on a pass-fail basis.</td>
</tr>
</tbody>
</table>

Courses meeting specific GURs are listed below. Courses in, or cross listed with, a student's major field may not be used to satisfy General University Requirements, except for the communication proficiency.

Students who have completed an approved Associate of Arts or Associate of Science degree at a Washington community college including a course pattern which approximates the General University Requirements (GUR) for Graduation of Washington State University, as determined by the WSU Office of Admissions, will be considered to have fulfilled the General University Requirements.

STUDENTS IN THE COLLEGE OF SCIENCES AND ARTS must meet the requirements below which include the General University Requirements for Graduation:

Arts and Humanities and Social Sciences
21 hours from the list below with at least 6 hours in Arts and Humanities [H] and 6 hours in Social Sciences [S]. All courses must be outside the student’s major department or program.

Communication Proficiency
(same as GURs above)

Sciences
12 hours from the list below with at least 3 hours in the Biological Sciences [B] and
3 hours in the Physical Sciences [P] and 2 hours credit for 6 clock hours of laboratory work. All courses must be outside the student's major department or program.

Foreign Language
1 year (2 semesters) of one foreign language at the university level or 2 years of one foreign language at the high school level. Demonstrated proficiency by means of the Foreign Language Placement Examination may substitute for actual course work.

Transfer students holding an approved Associate of Arts or Associate of Science degree are responsible for the additional requirements of the College of Sciences and Arts.

Courses that Meet General University Requirements for Graduation

**ARTS AND HUMANITIES**

<table>
<thead>
<tr>
<th>Course</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anthropology</td>
<td>201, 304, 336, 355</td>
</tr>
<tr>
<td>Architecture</td>
<td>120, 121</td>
</tr>
<tr>
<td>Asian American Studies</td>
<td>315</td>
</tr>
<tr>
<td>Asian Studies</td>
<td>310, 315, 352, 374</td>
</tr>
<tr>
<td>Black Studies</td>
<td>102, 319, 320</td>
</tr>
<tr>
<td>Chicano Studies</td>
<td>220, 321, 324, 325, 340</td>
</tr>
<tr>
<td>Cinema</td>
<td>323</td>
</tr>
<tr>
<td>Communications</td>
<td>101</td>
</tr>
<tr>
<td>Fine Arts</td>
<td>101, 104, 201, 202, 203, 204, 300, 301, 302, 303, 304, 305</td>
</tr>
<tr>
<td>Foreign Languages</td>
<td>111, 310, 352</td>
</tr>
<tr>
<td>French</td>
<td>203, 304, 315, 316, 333, 334, 350</td>
</tr>
<tr>
<td>German</td>
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</tr>
<tr>
<td>Japanese</td>
<td>401</td>
</tr>
<tr>
<td>Russian</td>
<td>203, 304, 315, 350</td>
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<tr>
<td>Spanish</td>
<td>203, 304, 315, 316, 324, 325, 333, 350</td>
</tr>
<tr>
<td>Swedish</td>
<td>303, 350</td>
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<tr>
<td>History</td>
<td>340, 342, 343, 374, 440, 441, 444</td>
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<tr>
<td>Humanities</td>
<td>100, 101, 198, 202, 204, 301, 310</td>
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<tr>
<td>Music</td>
<td>160, 362, 363, 364</td>
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<tr>
<td>Philosophy</td>
<td>101, 107, 198, 201, 220, 260, 300, 305, 310, 314, 315</td>
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<tr>
<td>Physical Education</td>
<td>340</td>
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<tr>
<td>Speech</td>
<td>160, 362, 365, 366</td>
</tr>
<tr>
<td>Speech Communication</td>
<td>112, 250</td>
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</table>

**SOCIAL SCIENCES**

<table>
<thead>
<tr>
<th>Course</th>
<th>Courses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aging</td>
<td>356</td>
</tr>
<tr>
<td>Agricultural Economics</td>
<td>201, 301</td>
</tr>
<tr>
<td>Anthropology</td>
<td>101, 198, 203, 230, 301, 303, 309, 320, 330, 331, 350</td>
</tr>
<tr>
<td>Asian American Studies</td>
<td>201, 203, 275</td>
</tr>
<tr>
<td>Asian Studies</td>
<td>270, 275</td>
</tr>
<tr>
<td>Black Studies</td>
<td>101, 310, 311, 324, 370, 381</td>
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<tr>
<td>Chicano Studies</td>
<td>110, 248, 272, 313, 372, 383</td>
</tr>
<tr>
<td>Child and Family Studies</td>
<td>248</td>
</tr>
<tr>
<td>Communications</td>
<td>373</td>
</tr>
<tr>
<td>Economics</td>
<td>102, 198, 201, 203</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>300 [U]</td>
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<tr>
<td>Environmental Science</td>
<td>101 [U], 102 [U]</td>
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### Communication Proficiency

<table>
<thead>
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<tr>
<td>Agriculture</td>
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<tr>
<td>Speech Communication</td>
<td>102, 235, 302, 330, 331</td>
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### Written Communication Proficiency

<table>
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<th>Course</th>
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<tbody>
<tr>
<td>Chicano Studies</td>
<td>102</td>
</tr>
<tr>
<td>English</td>
<td>101, 102, 105, 198, 201, 301</td>
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### Biological Sciences

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>Anthropology</td>
<td>260</td>
</tr>
<tr>
<td>Bacteriology</td>
<td>101 (L)</td>
</tr>
<tr>
<td>Biological Science</td>
<td>101, 102 (L), 103 (L), 104 (L), 298 (L)</td>
</tr>
<tr>
<td>Botany</td>
<td>201 (L), 332 (L)</td>
</tr>
<tr>
<td>Environmental Science</td>
<td>303</td>
</tr>
<tr>
<td>Forestry</td>
<td>303</td>
</tr>
<tr>
<td>Genetics</td>
<td>201</td>
</tr>
<tr>
<td>Zoology</td>
<td>135, 251 (L), 330</td>
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### Physical Sciences

<table>
<thead>
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<th>Course</th>
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</thead>
<tbody>
<tr>
<td>Astronomy</td>
<td>135</td>
</tr>
<tr>
<td>Chemistry</td>
<td>101 (L), 102 (L), 105 (L), 106, 111 (L), 212 (L), 298 (L)</td>
</tr>
<tr>
<td>Geology</td>
<td>101 (L), 102 (L), 310 (L), 322, 350 (L)</td>
</tr>
<tr>
<td>Materials Science and Engineering</td>
<td>101 (L)</td>
</tr>
<tr>
<td>Physics</td>
<td>101 (L), 102 (L), 201 (L), 202 (L), 322, 380</td>
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### Sciences

<table>
<thead>
<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>Aging</td>
<td>130</td>
</tr>
<tr>
<td>Chemical Engineering</td>
<td>174</td>
</tr>
<tr>
<td>Computer Science</td>
<td>140</td>
</tr>
<tr>
<td>Electrical Engineering</td>
<td>300 [U]</td>
</tr>
<tr>
<td>Environmental Science</td>
<td>101 [U], 102 [U], 174</td>
</tr>
<tr>
<td>Food Science</td>
<td>170</td>
</tr>
<tr>
<td>Human Nutrition and Foods</td>
<td>130</td>
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</tbody>
</table>
Materials Science and Engineering 103 (L)
Mathematics 103, 105, 116, 140, 141, 171, 198, 201, 205, 300

(L) Course includes laboratory work.
[U] Course meets GUR in either sciences or social sciences.

Certificates and Degrees Granted

CERTIFICATES
Provisional (for teaching)

ACADEMIC DEGREES

Accounting, B Acct, M Acct
Adult and Continuing Education, MACEd
Agricultural Economics, BS, MA, PhD
Agricultural Education, BS
Agricultural Engineering, BS
Agricultural Mechanization, BS
Agriculture, BS
Agronomy, BS, MS, PhD
American Studies, BA, MA, PhD
Animal Sciences, BS, MS, PhD
Anthropology, BA, MA, PhD
Architectural Studies, BS
Architecture, B Arch
Asian Studies, BA
Bacteriology and Public Health, BS, MS
Bacteriology, PhD
Biochemistry, BS, MS, PhD
Biology, BS, MS
Black Studies, BA
Botany, MS, PhD
Business Administration, BA, MBA
Chemical Engineering, BS, MS
Chemical Physics, PhD
Chemistry, BS, MS, PhD
Chicano Studies, BA
Child and Family Studies, MA
Civil Engineering, BS, MS
Communications, BA
Computer Science, BS, MS, PhD
Construction Management, BS
Criminal Justice, BA, MA
Economics, BA, MA, PhD
Education, BA, EdM, MA, EdD, PhD
Electrical Engineering, BS, MS
Engineering, BS, MS
Engineering Science, PhD
English, BA, MA, PhD
Entomology, BS, MS, PhD
Environmental Engineering, MS
Environmental Science, BS, MS
Fine Arts, BA, MFA
Food Science and Technology, BS
Food Science, MS, PhD
Foreign Languages and Literatures, BA, MA
Forest and Range Management, MS
Forest Management, BS
Genetics and Cell Biology, MS, PhD
Geological Engineering, BS, MS
Geology, BS, MS, PhD
History, BA, MA, PhD
Home Economics, BA, BS, MA, MS
Horticulture, BS, MS, PhD
Hotel and Restaurant Administration, BA
Humanities, BA
Industrial Technology, BA
Interior Design, BA
Landscape Architecture, BS
Liberal Arts, B Lib A
Literary Studies, PhD
Materials Science and Engineering, MS
Mathematics, BS, MS, DA, PhD
Mechanical Engineering, BS, MS
Music, BA, B Mus, MA
Nursing, BS, MS
Nutrition, MS, PhD
Pharmacology and Toxicology, MS, PhD
Pharmacy, B Phar
Philosophy, BA
Physical Education, BS, MS, PhD
Physical Metallurgy, BS
Physics, BS, MS, PhD
Plant Pathology, MS, PhD
Political Science, BA, MA, PhD
Psychology, BS, MS, PhD
Range Management, BS
Recreation and Leisure Studies, BA
Regional Planning, MRP
Science, BS
Social Sciences, BA
Social Studies, BA
Sociology, BA, MA, PhD
Soils, BS, MS, PhD
Speech, BA, MA
Teaching, MAT (of Speech)
Veterinary Medicine, DVM
Veterinary Science, BS, MS, PhD
Vocational Technical Education, MS
Wildlife Biology, BS, MS
Zoology, BS, MS, PhD
Zoophysiology, PhD
Tuition, Fees, and Financial Aid

Tax sources of the state finance the major portion of facilities and operation of the instructional program, student services, and related activities. Students share in the costs by paying tuition, fees, and other charges as established by the Board of Regents.

Tuition, fees, and other charges are subject to change and are effective when established by the Board of Regents. The fees listed below are based on legislation pending at press time. Actual fees may differ.

Summary of Yearly Expenses

<table>
<thead>
<tr>
<th></th>
<th>Resident</th>
<th>Nonresident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Board and Room (approximate)</td>
<td>$2350.00</td>
<td>$2350.00</td>
</tr>
<tr>
<td>Registration Fees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Undergraduate</td>
<td>1308.00</td>
<td>3064.00</td>
</tr>
<tr>
<td>Graduate</td>
<td>1890.00</td>
<td>3624.00</td>
</tr>
<tr>
<td>General University Damage Deposit (refundable)</td>
<td>15.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Hospitalization Insurance Single Coverage (optional)(^1)</td>
<td>est. 150.00</td>
<td>150.00</td>
</tr>
</tbody>
</table>

REGISTRATION FEES per semester

Payment of registration fees is due on or before the fifth day of each semester. Payment after that day will result in a late service fee.

**FULL TIME\(^2\)**

<table>
<thead>
<tr>
<th></th>
<th>Resident</th>
<th>Nonresident</th>
<th>Veteran</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate (7-18 credit hours)</td>
<td>$654.00</td>
<td>$1812.00</td>
<td>$264.00</td>
</tr>
<tr>
<td>(19 and above)</td>
<td>654.00 + 58.00/ch</td>
<td>1812.00 + 174.00/ch</td>
<td>264.00</td>
</tr>
<tr>
<td>Graduate (7-18 credit hours)</td>
<td>945.00</td>
<td>2346.00</td>
<td>264.00</td>
</tr>
<tr>
<td>(19 and above)</td>
<td>945.00 + 88.00/ch</td>
<td>2346.00 + 277.00/ch</td>
<td>264.00</td>
</tr>
<tr>
<td>DVM</td>
<td>1527.00</td>
<td>3867.00</td>
<td>364.00</td>
</tr>
<tr>
<td>WAMI</td>
<td>1452.00</td>
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</tbody>
</table>

**PART TIME (1-6 credit hours)\(^2\)**

(Per credit hour; minimum charge 2 credit hours)

<table>
<thead>
<tr>
<th></th>
<th>Resident</th>
<th>Nonresident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>65.00</td>
<td>181.00</td>
</tr>
<tr>
<td>Graduate</td>
<td>95.00</td>
<td>234.00</td>
</tr>
<tr>
<td>DVM</td>
<td>153.00</td>
<td>387.00</td>
</tr>
</tbody>
</table>

ADVANCED PAYMENT (see p. 21) .................................................................................. $50.00

\(^1\) Required of all foreign students.

\(^2\) Fees are based on credit hour enrollments: 1-6 credits are charged part time fees; 7-18 credits are charged full time fees; 19 credits and above are charged full time fees plus a per credit hour charge for each credit over 18. The credit hours listed in this table are for fee purposes only. "Full Time Enrollment" is normally 12 credit hours—see definitions listed on page 23 of this Catalog.
DEPOSITS
General University Damage Deposit (required of all students) $15.00
Refund checks of all or balance of deposits are mailed within six weeks after the close of the school year. (The $15 Damage Deposit is used for the Chinook yearbook, if Chinook is ordered at the time of registration.)

SPECIAL REGISTRATION FEES
Directed Teaching (Educ 405 or 406 or VTE 407 only) one block $519.00
two blocks 654.00
Pullman High School Cooperative Program 88.00
Psych 595 only 61.00
FRM 407, 517, and 545 200.00
No-Credit Graduate Enrollment (annual) 31.00
Consult Time Schedule for additional fees related to specific courses.

OTHER FEES AND CHARGES
(Not necessarily applicable to all students)
Adding a course charge for each course added after the 10th day of the semester $ 5.00
Admission Application; undergraduate (nonrefundable) 15.00
Auditing a Course charge for each audit hour (does not apply to full fee-paying students) 20.00
Challenging a Course charge for each challenge examination petition (only matriculated students currently registered at WSU are eligible) 61.00
Copyright 20.00
Dishonored checks, service charge 10.00
Entrance qualifying graduates of unaccredited high schools test 10.00
Foreign Language reading examination 10.00
Foreign Student Orientation required of all new foreign students enrolled in more than 6 credit hours 165.00
Graduate School application 10.00
Graduation application, bachelor's degree 10.00
Graduation, master's and doctor's degrees 15.00
Late registration or late payment of fees on or before 10th day of semester 15.00
Late registration after 10th day of semester 50.00
Microfilming applicable to PhD and EdD degree candidates only 35.00
Placement Bureau Credential Service fee assessed after graduation for each set of credentials 3.00
Student Health Fee (per semester) (1984-85—$30.00) fee assessed to all full time students 20.00
Teacher's Statutory Certification 17.00
Transcript (per copy) 2.00
Veterinary Medicine application 15.00
Washington Student Lobby (optional) 1.00

Note: Overdue accounts owed the university will prevent release of transcripts and enrollment. Registration is not complete until all of the student's tuition and fees are paid.
Resident Status

Residency for tuition and fee purposes is determined by Section 4, Chapter 37 Laws of 1982, First Extraordinary Session and regulations contained in Chapter 250-18 WAC.

The administration of resident status shall be the responsibility of the Board of Regents through the institutional official appointed responsible for making decisions on resident status.

A resident student is one who is financially dependent upon a parent or legal guardian who maintains a bona fide domicile in the state of Washington or a financially independent student who maintains a bona fide domicile in the state of Washington for other than educational purposes. Financial dependence shall be determined by the amount and kind of financial assistance given to a student and whether or not the student has been claimed as a deduction on income tax forms in the year immediately preceding the year in which the application for resident status is made. The term domicile denotes a person's true, fixed and permanent home and place of habitation. Financial dependency or independency must be established for at least a one-year period immediately preceding the semester for which resident status is sought.

Active duty United States military personnel who have been stationed in the state of Washington for one year shall be considered to have resided in the state for purposes primarily other than educational and shall be considered financially independent.

Evidence to be considered in the establishment of residency must have existed no less than 12 consecutive months and may include the following:

1. Registration of motor vehicles, motor homes, travel trailers, boats or other personal property.
2. Driver's license.
3. Employment records.
4. Income tax returns.
5. Voter registration.
6. Selective service registration.
7. Purchase of primary residence, lease agreement or monthly rental receipts.
8. Resident status of students in schools attended outside the state of Washington.
9. Membership in professional, business, civic or other organizations.
10. Records of checking or savings accounts and safety deposit box rental.

Once a student's residency classification has been determined, that classification will remain unchanged in the absence of written evidence justifying change during the time the student is in continuous enrollment.

Applications for change in resident status must be submitted to the Office of Admissions no later than the 30th day following the first day of instruction of the semester for which application is made, assuming the student is qualified for resident status on the first day of classes of the semester. The burden of proof of resident status lies with the student.

Appeals of institutional determination of classification shall be subject to court review only under procedures described in Chapter RCW 28B.19. If erroneous, untrue or incorrect information submitted on an application results in an improper classification of resident or nonresident status or a final determination is reversed through the appeals process, institutions shall recover from the student or refund to the student, as the case may be, an amount equal to the total difference in tuition and fees had proper classification been made.

In accordance with RCW 28B.15.014 certain nonresidents shall be exempt from paying the nonresident tuition and fee differential. To be eligible for an exemption a nonresident student must provide documented evidence that he/she resides in the state of Washington and (1) holds a graduate service appointment designated as such by the institution involving not less than 20 hours per week; (2) is employed for an academic department in support of instructional or research programs involving not less than 20
hours per week or (3) is a faculty member, classified staff member, or administratively exempt employee holding not less than a half-time appointment or the spouse or dependent child of such a person. Exemption from nonresident tuition and fee differential shall apply only during the term(s) such person shall hold such appointments or be employed.

Refund Policy

Full refund, fall and spring semesters: Tuition, operating, student service and activity fees, the Student Health fee, and the Washington Student Lobby fee will be refunded in full if the student officially withdraws from the University prior to the sixth day of instruction of the semester for which fees have been paid.

Fifty percent refund, fall and spring semester: If the student withdraws on or after the sixth day of instruction but within 30 calendar days from the beginning of instruction, 50 percent of tuition, operating, student service and activity fees, and the Student Health fee, will be refunded. After 30 days from the beginning of instruction, no portion of the fees will be refunded.

Summer Session registration fees will be refunded in full if the student officially withdraws during the first three days of the official start of the session. After the third day of instruction, no portion of summer session fees will be refunded.

For short courses and sessions of less than four weeks’ duration, the refund period is 24 hours after the official start of the session.

Student Financial Assistance

Federal aid programs include National Direct and Guaranteed Student Loans, Pell Grants and Supplemental Educational Opportunity Grants, College Work-Study employment, and Health Professions and Nursing Loans. State-sponsored programs include tuition and fee waivers, State Work-Study employment, and State Need Grants. University sources of aid include scholarships, short-term loans, and part-time job placement.

Financial Aid Forms and information are available from the WSU Financial Aid Office, Room 139 French Administration Building.

A Financial Aid brochure containing specific information about financial aid programs, the rights and responsibilities of students participating in the programs, and general information deemed useful for prospective financial aid recipients is available upon request from the Financial Aid Office.

Deadlines for receipt of completed application forms are determined on an annual basis. The specific deadline dates are published in the informational brochure. Full consideration for all types of aid, including academic scholarships, can be given only to those whose forms are received by the deadline. Students who apply late will be assisted on the basis of available funds and will be counseled about possible alternative resources.

WSU Foundation

The WSU Foundation was formed in 1979 as the official fundraising body of Washington State University to encourage and administer private gifts in support of excellence at WSU. The primary function of the foundation is to develop effective, forward-looking development programs that generate much-needed private support from alumni, corporations, foundations, and other friends of the university. The foundation administers donations in a business-like manner and in the best interests of both the donor and the university. Inquiries may be addressed to the President, WSU Foundation, Pullman, WA 99164-1042.

Physically Impaired Students

The state of Washington administers several programs of assistance to needy physically impaired students.

Blind students who are residents of the state of Washington may receive financial assistance under provisions of either RCW 28B.10.210 through 28B.10.220 or RCW
74.16.011 through 74.16.183. Inquiries concerning eligibility under this program should be addressed to Services for the Blind, 3411 South Alaska Street, Seattle, Washington 98118.

Other students or prospective students who are residents and have a physical impairment may be eligible for assistance through rehabilitation programs administered by the state of Washington. Information concerning eligibility and level of assistance should be directed to the Department of Public Assistance, Division of Vocational Rehabilitation, Capitol Center Building, Olympia, Washington 98501.

Veterans' Benefits
The Veterans' Affairs Office, 346 French Administration Building, cooperates with the Veterans' Administration in carrying out the provisions of the public laws established to give educational benefits to veterans and children of deceased or totally disabled veterans. These benefits are administered under the following chapters of Title 38 of the U.S. Code: Chapter 31 covers those on the VA Vocational Rehabilitation program; Chapter 32 governs Post-Vietnam Era veterans (those who initially entered military service on or after January 1, 1977 and who participated in the Voluntary Educational Assistance Program); Chapter 34 pertains to Vietnam Era veterans who initially entered the service prior to December 31, 1976; and Chapter 35 covers the Dependents' Educational Assistance program, formerly termed War Orphans' and Widows' Educational Assistance.

Students should apply for admittance to the university before making application for benefits. Application for benefits should be made to the Regional Veterans Administration Office or the Coordinator of Veterans' Affairs, WSU, at least two months prior to the students' expected enrollment.

Students attending under either Chapter 34 or 35 should plan for at least two months between the approval of their application by the Regional Veterans Administration Office in Seattle and receipt of their first check. Current delays for students applying under Chapter 32 are approximately six months.

Veterans who (1) served in the Southeast Asian theatre of operation between August 5, 1964, and May 7, 1975, (2) qualify as a resident student under RCW 28B.15.012, and (3) enroll in an institution of higher education in the state of Washington on or before May 7, 1983, may qualify for a Vietnam Veterans' Tuition Increase Exemption as amended by the Washington State Legislature in 1979. Veterans claiming this special exemption should apply through the WSU Coordinator of Veterans' Affairs.

Special Benefits for Children of Veterans
The children of any veteran who was a Washington domiciliary and who within the past eleven years prior to 1973 had been determined by the federal government to be a prisoner of war (POW) or missing in action (MIA) in southeast Asia including Korea, or who shall become so hereafter, shall be admitted to Washington State University without the necessity of paying tuition or fees, provided that such student shall meet standard admission requirements. Prospective students who wish to qualify for this exemption should contact the Coordinator of Veterans' Affairs.

Information contained in this publication is hereby certified as true and correct in content and policy as of the date of publication, in compliance with the Veterans Administration DVB Circular 20-76-84 and Public Law 94-502.

C. James Quann, Registrar

Waiver of Fees for Children of Law Enforcement Officers and Firefighters
Students over the age of 19 who are the children of law enforcement officers or firefighters who lost their lives or became totally disabled in the line of duty while employed by any public law enforcement agency or full-time or volunteer fire department in the
state of Washington may be exempted from the payment of tuition and fees. Students claiming this special exemption should apply to the WSU Controller, and provide legal documentation of the death or disablement under the conditions prescribed for eligibility in RCW 28B.15.380.

Waiver of Fees for Persons Aged 60 and Over

Pursuant to Chapter 157, Laws of 1975, First Extra Session, persons aged 60 and over may enroll at Washington State University without charge, on an audit basis, for up to two courses per semester or summer session provided space is available in the classes selected. To take advantage of this waiver, the applicant should report to the Office of the Registrar during the first two weeks of classes of fall or spring semester, or the first week of the summer session. Applicants may not enroll under this basis prior to the first day of classes. Applicants will complete the required enrollment form designating course or courses desired, and sign a statement certifying they are at least 60 years of age, residents of the state of Washington, and that the course(s) audited will not be used for credentials or salary schedule increases.

Applicants will be given an audit approval card to be signed by the instructor and returned to the Registrar's Office. Upon receiving this signature, the student may attend class without payment of tuition and fees. However, special course and studio fees, if any, must be paid by all auditors. Applicants will not be issued student I.D. cards nor will they be eligible for treatment by the Student Health Center.

Staff/Faculty Fee Waiver

A fee waiver option is available to full-time classified staff, faculty, and exempt employees who wish to enroll for six credits or less per semester or three credits in a Summer Session. Qualified personnel who wish to enroll under this program must follow regular admission procedures and present a completed Staff/Faculty Registration Authorization Form at the time of enrollment. Complete information on this fee waiver program is listed in the Time Schedule.
Living Facilities

The university has residence hall space for 5,953 students. There are 24 residence halls, including a graduate center housing 300 students. Some halls are women-only halls, some are men-only, and some halls are coeducational. Facilities for use by handicapped students are provided. Residence hall information may be obtained by writing to the Housing and Food Service Office, French Administration Building, Pullman, Washington 99164-1012.

Twenty-four national social fraternities and 14 national social sororities currently maintain chapter houses at Washington State. The chapter houses vary in size, accommodating from thirty to sixty people. Membership in a fraternity or sorority is by invitation.

Students living in residence halls, fraternities, and sororities elect their own officers, and there are various executive and coordinating organizations through which cooperative projects may be pursued. Junior and Senior Panhellenic considers matters of common interest to sororities, while the Interfraternity Council represents the fraternities. The Residence Hall Association acts on behalf of the men’s and women’s residence halls.

Housing Regulations

All single undergraduate freshmen under 20 years of age are required to live in organized living groups, which are officially recognized by the university (residence halls, fraternities, and sororities), their first semester unless they are residing with parents or legal guardians. Exemptions are granted when a student demonstrates to the Office of Student Affairs that (1) he or she has attended an institution of higher education as a regularly enrolled student for at least two regular semesters or three regular quarters (excluding summer sessions), (2) he or she is living with immediate family in a family situation (mother and/or father; legal guardian; married brother or sister; aunt or uncle; grandparents qualify as immediate family), (3) he or she has secured a statement from a physician that residence in a living group would have detrimental effects on the student’s physical health or emotional well being.

Residence Halls and Dining Halls

Washington State University can normally provide space in its residence halls for most beginning students who request it. The estimated cost of room and board per person, multiple occupancy and 20 meals per week for the 1983-84 academic year is estimated to be $2435; for the 1984-85 academic year, $2680. This amount is to be paid prior to registration or on an arranged installment basis. A security deposit and a signed room and board contract are required before space can be reserved.

A student desiring to cancel an advance room reservation and receive a partial refund of the security room deposit must notify the Program Assistant for Residence Halls, French Administration Building, in writing prior to August 15 for fall term and January 15 for spring term. Once the applicant has been assigned to a hall, the security deposit is initially held to insure occupancy of the space, and then to guarantee against damage, breakage, and loss during a student’s stay in the halls. The deposit is held until the individual permanently leaves the residence hall system.

All students residing in residence halls must purchase meal tickets for use in university-operated dining halls. The dining halls are managed by trained food service personnel and are operated on a nonprofit basis.

The Board of Regents establishes rules for the use of residence halls and other university housing. The university reserves the right to use the unassigned beds in any of the residence halls at any time.

Washington State University is not liable for the loss of money or valuables by any person, or for the loss of, or damage to, any resident’s property, or personal injury sustained on the premises. It is urged that appropriate insurance be obtained prior to hall occupancy.
Family Student Housing
The university maintains approximately 650 apartments for students with legal dependents in residence. A rental request for such a unit will be considered when an application and a security deposit of $60 are received. Units for use by handicapped students are available on a limited basis. For detailed information write to: Family Housing Office, Rogers Hall, Pullman Washington 99164-3440.

Single Student Apartments
The university operates 550 apartments that are available to unmarried students desiring apartment-type living. Sophomores and above are eligible for this type of housing. Apartments for use by handicapped students are available on a limited basis. An application and $60 security deposit are required before a request will be considered. Most units are two bedroom, and are completely furnished except for linen, kitchen utensils, cleaning equipment, and study lamps. Normally two, three, and four students make up each living group. For further information, write to Program Assistant for Apartments, Housing and Food Services, French Administration Building, Pullman Washington 99164-1012.
The Colleges

The Graduate School

Intercollegiate Center for Nursing Education
College of Agriculture and Home Economics

James L. Ozbun, Dean

The College of Agriculture and Home Economics is responsible for teaching, research, and extension in areas associated with agriculture, forestry, and home economics throughout the state.

College programs in agriculture are much broader than preparing people to farm, ranch, teach, manage forests, or to do government work. A farm background is not a requirement for careers in agriculture and forestry. Students prepare for careers in food processing, or manufacture of farm equipment or supplies, or pest management. Careers in economic aspects of agriculture are concerned with farm management, credit, marketing, and sale and distribution of farm products. Those who want to teach can become vocational agriculture teachers, extension workers, communications workers in radio, TV, and journalism or may serve as educators for firms and businesses. Those preferring scientific careers find them by preparing for research work, college teaching, and highly technical pursuits in industry and government.

The goal of home economics is to prepare men and women for careers and leadership roles in human services, education, business and research. Curricula include work in arts and humanities, and natural and social sciences basic to home economics courses. Home economics courses synthesize relevant knowledge from basic disciplines and apply it to problems and decisions of the individual and family.

College programs in home economics prepare persons for positions as dietitians, parent educators, consumer and family management consultants, and directors of aging programs. Persons with appropriate majors enter fields of interior design, retail merchandising, consumer services, commercial food service, community health, and journalism. There are opportunities for graduates in teaching in junior and senior high schools, community colleges, and for work in cooperative extension and adult education, and administration and supervision of preschool and child care centers. Those who are granted master’s degrees are educationally qualified to fill positions in research, cooperative extension, governmental agencies, foreign service, college teaching and business.

Admission

The requirements for admission to the College of Agriculture and Home Economics are the same as those for WSU. High school students planning to enroll in the college are urged to work closely with their counselor, and with representatives from WSU in developing an appropriate background of high school courses in biological, physical, and social sciences; mathematics; and other elective areas.

Transfer Students

Transfer students who have completed one year in another college or university ordinarily will have no difficulty in completing the requirements for one of the bachelor’s degrees in three additional years.

Students who have completed two years before transferring may have some difficulty in completing requirements in two additional years because of required courses and course sequences. To avoid this difficulty, students enrolled in other colleges or universities but planning to transfer to the College of Agriculture and Home Economics at Washington State University should concentrate as much as possible on general university and departmental requirements normally scheduled during the freshman and sophomore years, with particular attention to those subjects required for the intended major.

Requirements for Graduation

Requirements for graduation in the College of Agriculture and Home Economics vary according to the major and the degree to be granted as described in the component departmental sections of this catalog. The student and the adviser jointly have the responsibility of selecting courses to fit the student's native ability and professional interests consistent with departmental and General University Requirements. A student is encouraged to do more than satisfy the minimum requirements.
## Agriculture Degrees

<table>
<thead>
<tr>
<th>Degree</th>
<th>Department or Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Science in Agriculture</td>
<td>General Agriculture, Plant Pathology</td>
</tr>
<tr>
<td>Master of Arts</td>
<td>Agricultural Economics</td>
</tr>
<tr>
<td>Master of Adult and Continuing Education</td>
<td>Education, General Agriculture</td>
</tr>
<tr>
<td>Master of Regional Planning</td>
<td>Regional Planning</td>
</tr>
<tr>
<td>Master of Science</td>
<td>Agronomy, Animal Sciences, Entomology, Environmental Science, Food Science, Forest and Range Management, Genetics and Cell Biology, Horticulture, Nutrition, Plant Pathology, Soils</td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>Agricultural Economics, Agronomy, Animal Sciences, Entomology, Food Science, Genetics and Cell Biology, Horticulture, Nutrition, Plant Pathology, Soils</td>
</tr>
</tbody>
</table>

1 Administered by the College of Education
2 Administered by the College of Engineering
3 Administered by the College of Sciences and Arts

## Majors

In Agriculture the student has a choice of 20 undergraduate majors, 6 with separate curricula, as shown below and a choice of a minor in many of the departments.

<table>
<thead>
<tr>
<th>Major</th>
<th>Administering Department or Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural Communications</td>
<td>General Agriculture</td>
</tr>
<tr>
<td>Agricultural Economics</td>
<td>Agricultural Economics</td>
</tr>
<tr>
<td>Separate curricula in agribusiness management, technical agriculture and general agricultural economics</td>
<td></td>
</tr>
<tr>
<td>Agricultural Education¹</td>
<td>College of Education</td>
</tr>
<tr>
<td>Agricultural Engineering²</td>
<td>College of Engineering</td>
</tr>
<tr>
<td>Agricultural Mechanization</td>
<td>Agricultural Engineering</td>
</tr>
<tr>
<td>Agronomy</td>
<td>Agronomy and Soils</td>
</tr>
<tr>
<td>Separate curricula in technical, business and industry, and science</td>
<td></td>
</tr>
</tbody>
</table>
Animal Sciences
Separate curricula in general livestock, beef cattle and sheep, dairy cattle, horses, swine, poultry, meats, animal breeding, animal biology, animal nutrition, and animal physiology.

Entomology

Environmental Science

Food Science and Technology

Forest Management\(^3\)
Separate curriculum in Wildland Recreation Management

General Agriculture

Horticulture
Separate curricula in fruit and vegetable production, ornamental horticulture

Integrated Pest Management

Landscape Architecture\(^4\)

Plant Pathology

Range Management

Soils
Separate curricula in science, soil management, and soil inventory

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\(^1\)Degree and administration by College of Education
\(^2\)Degree and administration by College of Engineering
\(^3\)Accredited by the Society of American Foresters
\(^4\)Accredited by the American Society of Landscape Architects

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### Home Economics Degrees

<table>
<thead>
<tr>
<th>Degree</th>
<th>Department or Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Arts in Home Economics</td>
<td>Child and Family Studies; Clothing and Textiles</td>
</tr>
<tr>
<td>Bachelor of Science in Home Economics</td>
<td>Human Nutrition and Foods,(^1) Home Economics Education</td>
</tr>
<tr>
<td>Bachelor of Arts in Interior Design</td>
<td>Interior Design(^2)</td>
</tr>
<tr>
<td>Master of Arts in Child and Family Studies</td>
<td>Child and Family Studies</td>
</tr>
<tr>
<td>Master of Arts in Home Economics</td>
<td>Clothing, Interior Design and Textiles</td>
</tr>
<tr>
<td>Master of Science in Food Science</td>
<td>Food Science and Technology; Human Nutrition and Foods(^1)</td>
</tr>
<tr>
<td>Master of Science in Home Economics</td>
<td>Human Nutrition and Foods¹</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Master of Science in Nutrition</td>
<td>Nutrition; Human Nutrition and Foods²</td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>Food Science and Technology; Nutrition</td>
</tr>
</tbody>
</table>

¹Dietetics—Accredited by the American Dietetics Association
²Accredited by the Foundation for Interior Design Education Research

**Majors**

In Home Economics, each department offers several major options as indicated below. Students may also select any of these options as minors. In addition, a minor in Aging is available through the Department of Child and Family Studies.

<table>
<thead>
<tr>
<th>Department or Area</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child and Family Studies</td>
<td>Child Development</td>
</tr>
<tr>
<td></td>
<td>Consumer Studies</td>
</tr>
<tr>
<td></td>
<td>Family Studies</td>
</tr>
<tr>
<td></td>
<td>Housing</td>
</tr>
<tr>
<td></td>
<td>Preschool</td>
</tr>
<tr>
<td>Clothing, Interior Design and Textiles</td>
<td>Clothing and Textiles</td>
</tr>
<tr>
<td></td>
<td>Fashion Merchandising</td>
</tr>
<tr>
<td></td>
<td>Interior Design</td>
</tr>
<tr>
<td>Home Economics Education</td>
<td>Home Economics Education</td>
</tr>
<tr>
<td>Human Nutrition and Foods</td>
<td>Coordinated Undergraduate Option in General Dietetics (includes internship)</td>
</tr>
<tr>
<td></td>
<td>Food Related Business</td>
</tr>
<tr>
<td></td>
<td>Food Related Communication</td>
</tr>
<tr>
<td></td>
<td>Food Service Management</td>
</tr>
<tr>
<td></td>
<td>General Dietetics (requires post baccalaureate internship)</td>
</tr>
<tr>
<td></td>
<td>Research</td>
</tr>
</tbody>
</table>

**College of Economics and Business**

Rom J. Markin, Dean

The programs of the College of Business and Economics relate to instruction, research, and public service. The two principal objectives of these programs are (1) to promote an understanding of the business environment and (2) to educate students to deal with the complexities of that environment. The college offers courses of study leading to a variety of careers in the areas of business management, government, business and economics research, and the teaching of business and economics.

Research efforts within the college are concerned largely with topics of interest to both the general populace and the business communities of the state of Washington and the nation. The results of this research are disseminated in the classroom, through publications, at business seminars, and at professional conferences.

The Business Development Program, advised by business leaders from throughout the state,
provides a direct means by which the faculty and staff of the college can work with the business community to identify and to solve business problems.

Faculty members of the college make valuable contributions to the university and to their professional areas through teaching undergraduate and graduate students; pursuing substantial research efforts; assuming leadership roles in regional and national professional organizations; and performing consulting activities in business, industry, and public administration agencies. These activities enhance the realism and relevance of the instructional programs within the college.

The long-term growth of economic activity in the state of Washington, the Pacific Northwest, and the nation generally has resulted in a strong demand for students who have completed the curricula offered by the College of Business and Economics. The growing complexity and sophistication of the business environment makes it increasingly imperative that today's students understand the economic and business systems that surround them. Such an understanding is a vital prerequisite to more intelligent citizenship and good government. To be educated today, one must have a solid understanding of economic structures, business practices, business philosophies, and business institutions. The basic courses of the college are structured to give students an understanding of major problems in the business world and the economy; but more importantly, the instruction focuses upon the careful and systematic analysis of the problems of the business firm, the understanding and mastery of the management and decision-making processes, and the overall planning and control of business activity. The courses are also designed to foster an understanding of the chief problems of public policy in business and economic matters. The instructional programs are designed for students who eventually expect to become business executives, to assume research or management positions in private or governmental organizations, and to become teachers of business and economics. The close relationship between the business and economics programs within the college and the interdisciplinary cooperation with departments throughout the university provide carefully integrated educational experiences for students.

The curricula leading to degrees in business administration at both the graduate and undergraduate levels are accredited nationally by the American Assembly of Collegiate Schools of Business. Each major option embraces a core of courses that provides a common body of knowledge and advanced study in a particular field. The three business departments, Accounting and Business Law, Business Administration, and Management and Administrative Systems, offer the following major specializations:

- Accounting
- Finance
- General Business Management
- Human Resources/Personnel
- Information Systems
- Insurance
- Management
- Marketing
- Quantitative Methods
- Real Estate
- Transportation and Physical Distribution

Within the Department of Economics, students may specialize in such areas as:

- Consumer Economics
- Econometrics
- Economic Development
- Economic History
- Economic Theory
- History of Economic Thought
- Industrial Organization and Government
- Regulation
- International Trade
- Labor Economics
- Labor Relations and Collective Bargaining
- Mathematical Economics
- Money and Banking
- Public Finance and Taxation
- Public Utility
- Transportation

Within the college a specialized degree is offered in the area of Hotel and Restaurant Administration.

To meet the demand for graduates with training in both business administration and one or more technical fields such as agriculture, chemistry, engineering, forestry, journalism, and industrial psychology, special programs are available for persons with a bachelor of arts degree in the specialized field to earn a second bachelor of arts degree in business administration.

Graduate work may be taken in business administration and economics in most of the areas of specialization listed within these two major fields.

All curricula in the College of Business and Economics are designed to fulfill two major
objectives. The first is to develop within students a broad understanding of the business system as a whole and an appreciation of that system in the cultural, economic, and political framework of society. The second is to enable students to pursue more intensive study in specialized areas during the latter part of their educational programs.

Admission Requirements

Admission requirements to the programs of the College of Business and Economics may vary. Requirements for specific programs are shown in the departmental section of this catalog. Interested students are advised to contact the departments for the latest requirements for major certification. Because of unusually high enrollments and limited space in classes, students may certify as business administration, economics, or hotel and restaurant administration majors only after earning a minimum of 40 semester hours, 6 of which must be in business or economics core courses, with a cumulative g.p.a. and business or economics g.p.a. which meets current standards determined by competitive ranking of students.

For exact information regarding the acceptability of professional courses taken at other institutions in areas of study offered by the departments of the College of Business and Economics, prospective students should communicate with the appropriate department chairperson or director.

Degrees

The curricula of the College of Business and Economics lead to the following degrees:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Department or Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Accounting</td>
<td>Accounting and Business Law</td>
</tr>
<tr>
<td>Bachelor of Arts</td>
<td>Business Administration, Economics, Hotel and Restaurant Administration</td>
</tr>
<tr>
<td>Master of Accounting</td>
<td>Accounting and Business Law</td>
</tr>
<tr>
<td>Master of Arts</td>
<td>Economics</td>
</tr>
<tr>
<td>Master of Business Administration</td>
<td>Business Administration</td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>Economics</td>
</tr>
</tbody>
</table>

College of Education

George B. Brain, Dean

The College of Education consists of the Departments of Education, Physical Education for Men, Physical Education for Women, Vocational Technical Education, and the program in Adult and Continuing Education.

The College of Education prepares teachers for elementary school, secondary school, and college instruction; specialists in a variety of educational fields; administrators for schools, colleges, and universities; and leisure and recreation specialists for community agencies. The college provides professional training in physical education, recreation, industrial education, home economics, agricultural education, vocational technical education, and adult and continuing education as well as for the community colleges, and offers a variety of educational services to local school systems.

Teacher education is greatly strengthened by virtue of the program being in a multi-purpose university with a land grant tradition. Not being gifted with prophetic vision of what the future
holds, the departments of the College of Education have elected to place their trust in people—students and teachers. The college holds that people of courage, idealism, and intellectual promise, nurtured in the elements of disciplined liberal education, through professional training, and imbued with respect for high standards of professional performance, will rise to the demands of new circumstances, exercising discriminating choice in the options before them. The college educates persons not only for adaptability, but also for responsibility in making decisions.

The General University Requirements provide a foundation for professional work in the College of Education through offerings in the humanities and in the social and natural sciences. In accord with approved professional trends the College of Education has made provision for performance-based programs leading to degrees and professional certification. The mission of the graduate programs in the College of Education is to furnish intensive preparation for persons serving in teaching, supervisory, special services, or administrative fields in elementary, middle school, junior high, senior high, community colleges, or for others who contemplate such work or who are interested in related areas of professional service. Candidates for certification must demonstrate knowledge and competencies at qualified levels of professional practice.

Teacher education curricula at all degree levels in the College of Education are accredited by the National Council for Accreditation of Teacher Education. The College of Education is a member of the American Association of Colleges for Teacher Education and the University Council on Education Administration. State departments of education throughout the United States recognize and accept for certification purposes the professional work completed in the College of Education.

The College of Education also functions as a service institution for the schools and communities in the state of Washington. Research services are provided to education and health-related agencies throughout the United States and internationally. Services of faculty are available for consultant purposes, school studies, professional development programs, school seminars, and community conferences in the departmental specialties.

## Degrees

The degrees offered by the College of Education are as follows:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Department or Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Arts</td>
<td>Education (Elementary majors), Industrial Technology, Recreation and Leisure Studies</td>
</tr>
<tr>
<td>Bachelor of Science</td>
<td>Agricultural Education, Physical Education</td>
</tr>
<tr>
<td>Master of Adult and Continuing Education</td>
<td>Education, General Agriculture</td>
</tr>
<tr>
<td>Master of Science</td>
<td>Physical Education, Vocational Technical Education</td>
</tr>
<tr>
<td>Master of Arts</td>
<td>Education</td>
</tr>
<tr>
<td>Master of Education</td>
<td>Education</td>
</tr>
<tr>
<td>Doctor of Education</td>
<td>Education</td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>Education, Physical Education</td>
</tr>
</tbody>
</table>
The College of Engineering has responsibilities for instruction, research, and extension in most fields of engineering and architecture. These responsibilities are carried out through a variety of activities. Included are formal classroom instruction at both the undergraduate and graduate levels and informal instruction which may take the form of seminars, individual directed studies, and counseling. The fundamental and applied research programs conducted by faculty and staff of the college provide engineering work opportunities for undergraduate students, for graduate student thesis research, and for services to the industries of the state. The research and extension projects are designed to enhance the sound use of our material resources both economically and ecologically and to promote well-balanced industrial development. The collection and dissemination of technical information to industries and to the public in general is accomplished through short courses, symposia, technical publications and other means.

To perform these varied functions, the College of Engineering is organized into several degree-granting departments and research units, and an Engineering Extension Service. The faculty of the college participate in all three areas.

Engineering practice is based on a sound fundamental knowledge of chemistry, physics, and mathematics. Courses in engineering are designed to give thorough preparation in engineering sciences and in the solution of engineering problems.

The following undergraduate curricula in the college are accredited by the Accreditation Board for Engineering and Technology (ABET): agricultural engineering, chemical engineering, civil engineering, electrical engineering, mechanical engineering, and physical metallurgy. The curriculum leading to Bachelor of Architecture is accredited by the National Architectural Accrediting Board (NAAB).

The professional engineer translates ideas, designs, and physical concepts into systems, processes, structures, machines and products. It is also the responsibility of the engineer and architect to consider the economic and environmental impact of their activities on our culture and society.

It is the policy of the college to offer programs of such breadth that graduates may choose with confidence employment from the greatest possible number of specialties in their general field. The opportunity for specialization and training for higher-level performance is made available to qualified students in graduate programs in the various departments.

Majors in the College of Engineering must include 16 to 18 credit hours in social sciences and humanities in their degree program. Twelve of the total hours must be selected from courses meeting the General University Requirements for Graduation. A student is encouraged to take from this group at least one course above the introductory level. Individual departments may require three credit hours in biological science. In architecture, six of the nine required hours of architectural history help fulfill the humanities and social science requirement.

Students desiring special areas of study, combining various fields of engineering, or incorporating specialized areas outside the College of Engineering, should explore these possibilities with the department chair or Associate Dean for Instruction of the college.

Admission

Until prospective engineering majors have completed two semesters of calculus and either two semesters of chemistry or one semester of chemistry and one semester of physics, they will be assigned to an engineering adviser by the Curriculum Advisory Program (CAP).

Upon completion of these courses, the CAP student is ready to apply for certification into Pre-Engineering. Certification requirements for Pre-Engineering include at least a 2.5 semester g.p.a. and satisfactory completion of science and math prerequisites for engineering. Certification into Pre-Engineering does not guarantee admittance into a professional engineering departmental program.

Upon completion of specific departmental requirements, qualified students may apply for admittance, on a space-available basis, to that department's professional program. Upper-division courses cannot be taken without professional admittance.
The deadlines for application for professional admittance are November 15 for spring semester and April 15 for summer and fall semesters. Students denied admittance into a professional program may appeal to the Associate Dean, College of Engineering, for a review to ensure that departmental procedures were followed.

In order to achieve normal progress in the engineering program, the student should have completed in high school a minimum of one year of chemistry, one year of physics, one year of biological science, and four years of mathematics. Lack of this background may lengthen the engineering program of study.

Many students complete the first two years of engineering study at one of the many community colleges.

Bachelor of Science in Engineering

The Bachelor of Science degree in Engineering is a bi-disciplinary degree program for students who wish to enter a field for which an engineering background may be desirable such as medicine, law, or business administration.

The student will learn the fundamental principles common to most engineering disciplines although the program is not associated with a particular engineering department.

A minimum of 120 hours is required for the degree. The schedule of studies will normally include 15 hours mathematics; 15 hours science; 18 hours basic engineering in mechanics of solids and fluids, thermodynamics and heat transfer, materials, and electrical circuits; 5 hours technical skills; 20 hours engineering electives at the upper-division level; 24 hours related electives, and 18 hours humanities and social sciences.

Students interested in studying engineering as a background to combine with another non-engineering area should contact the College of Engineering for detailed information. Students with this degree who are planning graduate work in a specific field of engineering will normally be required to complete an additional year of study upon entering graduate school.

The Doctor of Philosophy in Engineering Science

The College of Engineering offers a program of study and research leading to the degree of Doctor of Philosophy in Engineering Science. The program is research oriented with course content drawn from all departments of the college, and from related physical sciences departments. Admission is open to qualified students with a recognized degree in engineering, mathematics, a physical science, or a biological science. This program should be of special interest to those who plan to teach and conduct research in engineering schools or industry.

Research projects may be undertaken in hydraulics, hydrology, fluid mechanics, mechanics of solids, heat transfer, thermodynamics, nature and behavior of metallic and non-metallic solids, electrical sciences, environmental science, computer-related studies, and other specialized fields of engineering sciences. Excellent laboratories are available for work in these areas.

Strong supporting work is available from the Departments of Mathematics, Physics, Chemistry, and Biological Sciences. The program is also supported by many excellent special university facilities such as the Nuclear Reactor, Computing Center, Spectrographic Laboratory, and the Electron Microscope Center.

Degrees

The curricula offered by the various departments of the College of Engineering lead to the following degrees:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Department or Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Science</td>
<td>Agricultural Engineering, Architectural Studies, Chemical Engineering, Civil Engineering, Construction Management, Electrical Engineering, Engineering, Geological Engineering, Mechanical Engineering, Physical Metallurgy</td>
</tr>
<tr>
<td>Bachelor of Architecture</td>
<td>Architecture</td>
</tr>
<tr>
<td>Master of Science</td>
<td>Chemical Engineering, Civil Engineering, Electrical Engineering, Engineering, Environmental Engineering, Geological Engineering, Materials Science and Engineering, Mechanical Engineering.</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>Engineering Science</td>
</tr>
</tbody>
</table>

The Graduate School

C. J. Nyman, Dean

Graduate Study

A graduate school has been described as a select community of scholars, faculty, and students dedicated to the extension of scholarship and the advancement of knowledge for the ultimate common good of mankind. The fields of intellectual and scholarly activity are numerous, and the student who contemplates graduate study should select a graduate school that offers a superior program in the chosen field. The student should study the accomplishments of the members of the Graduate Faculty, the adequacy of the research facilities, and the appropriateness of the curricula. For many, the Graduate School of Washington State University will provide advantageous and attractive opportunities.

Prospective graduate students should prepare themselves adequately, both in the fundamental subject matter necessary for their advanced work and in the other branches of learning, so that they may intelligently fulfill their responsibilities of leadership and service to society. In a graduate program a student is required to complete appropriate advanced courses, to participate in seminars, and to make an original contribution to knowledge. At least one academic year of full-time graduate study, or the equivalent, is necessary for the completion of a program leading to a master's degree. A doctor's degree is awarded in recognition of distinctive scholarship. A candidate should expect to devote at least three years of full-time graduate work, or the equivalent, beyond a recognized bachelor's degree (two years beyond a recognized master's degree) in fulfilling the requirements for this degree. Most advanced-degree programs emphasize the preparation of students for careers as productive scholars, and accomplishments in research constitute an important part of the training. It is recognized also that those who earn advanced degrees often become the teachers in our institutions of learning. For this reason, in many departments special attention is given to the preparation of students for careers in the teaching profession.

Except as they apply to undergraduate students only, graduate students are subject to the usual procedures and regulations of the institution and to such Graduate School rules and procedures as outlined on the following pages and in the Graduate Study Bulletin.

Organization and Administration

Opportunities for advanced study and research under members of the Graduate Faculty are offered in the Graduate School. Graduate instruction and research are carried on in most of the regularly organized departments. Programs of study leading to advanced degrees are under the general supervision of the Graduate Studies Committee.

The Graduate Faculty consists of the President of Washington State University, the deans of the various academic units, the chairpersons of the academic departments and programs in which advanced-degree programs are offered, and selected members of the faculty. Members of the Graduate Faculty have the responsibility of offering courses limited to graduate students, guiding graduate seminars, serving as thesis advisers and members of thesis committees, administering Graduate School examinations—master's, preliminary, and doctor's—and, from time to time,
serving as members of the Graduate Studies Committee. Graduate students have opportunities for studying and working with the members of the Graduate Faculty who have been selected because of their special competence and interest in an intimate professional relationship.

Degrees Granted

Doctor of Philosophy
Programs leading to this degree are available in the following fields of study: agricultural economics, agronomy, American studies, animal sciences, anthropology, bacteriology, biochemistry, botany, chemical physics, chemistry, computer science, economics, education, engineering science, English, entomology, food science, genetics and cell biology, geology, horticulture and landscape architecture, interdisciplinary studies, literary studies, mathematics, nutrition, pharmacology and toxicology, physical education, physics, plant pathology, political science, psychology, sociology, soils, veterinary science, zoology, and zoophysiology.

Doctor of Arts
The program of study leading to the degree Doctor of Arts is offered in interdisciplinary studies and the Department of Mathematics.

Master of Arts and Master of Science
The appropriate degree may be earned in most departments. (See the paragraph on degrees under the descriptive material for each department or other unit of the institution.)

Other Degrees
Courses of study leading to the Doctor of Education and Master of Education degrees are offered in the Department of Education.

A student may undertake a program for the Master of Fine Arts degree, Master of Business Administration, Master of Accounting, Master of Adult and Continuing Education, or Master of Regional Planning.

A program of study leading to the degree of Master of Arts in Teaching (MAT) is offered in speech.

Admission

Graduates of Washington State University and other colleges and universities whose degrees are recognized by this institution and who meet the requirements for admission to the Graduate School may be admitted to the Graduate School. For necessary interpretations, inquiries should be directed to the Dean of the Graduate School. Prospective graduate students who have established superior academic records and whose degree interests are compatible with the programs offered at Washington State University are invited to apply for admission to the Graduate School.

Students who contemplate entering the Graduate School should obtain application forms from the Office of the Graduate School. Applicants for admission must have complete official transcripts of all prior college and university work sent directly from the registrar of the institution at which the work was done to the Graduate School and to the major department. Complete credentials should be on file at least one month before registration. Transcripts from other institutions cannot be returned. Records of previous work at Washington State University need not be submitted.

In general, admission to the Graduate School on regular student status requires at least a B (3.00) average for the last half of undergraduate work. If admission is to be on the basis of graduate study elsewhere, it must have been accomplished in a recognized graduate school with at least a B (3.00) average in 12 or more semester hours of graded graduate work. Provisional admission may be granted to those students recommended by a department whose average is below 3.00, provided their total record indicates a high probability of success.

Admission of a student from a foreign university may be approved by the Dean of the Graduate School if the student presents a superior academic record, furnishes satisfactory evidence of adequate ability in English, and has sufficient financial resources. Such applications should be completed at least six months in advance of the proposed date of enrollment in the Graduate School. Foreign students who have undertaken graduate study in other institutions will be ac-
cepted only after evaluation of their undergraduate records, as well as their performance in graduate study and the minimum criteria as described above, will apply.

Because of limitations within certain departments, it may be necessary to deny admission to some qualified applicants. Students who come to Washington State University before receiving the Admission Certificate do so at their own risk. For further details the Graduate Study Bulletin should be consulted.

**Transfer of Graduate Credits**

Appropriate credits (with a grade of B or higher) earned in other accredited graduate schools may be applied to a limited extent toward an advanced degree; however, they may not be substituted for residence requirements. For necessary interpretations, inquiries should be sent to the Dean of the Graduate School.

**Summer Sessions**

Credit earned during summer sessions of Washington State University may be applied in the same manner and subject to the same rules and regulations as credit earned during regular semesters.

In a number of departments there are unusually good opportunities for research during the summer months. Summer work in the Department of Education is planned especially to meet the needs of teachers and administrators.

**Graduate Work through Continuing University Studies**

Credit earned in graduate-level courses taken through the WSU Office of Continuing University Studies will be accepted on graduate student programs without limit subject only to customary program approvals.

No extension credits from other institutions, or work done by correspondence with this or any other institution, or credit earned by special examination may be used to meet advanced-degree requirements.

**Graduate Study by Seniors**

Seniors who have at least a 3.00 grade point average in the last half of their undergraduate work at Washington State University may register for up to six semester hours of work in the Graduate School in excess of the number of hours required to complete the bachelor's degree. Graduate School approval is required at the time of registration. Work done by an undergraduate under other conditions may not be applied toward an advanced degree.

Seniors who wish to enroll in 500-level courses for undergraduate credit must obtain approval of the major adviser and the chairperson of the department or program in which the course is offered.

**Registration**

All graduate students must maintain continuous enrollment in the Graduate School, registering for each semester and summer session from the time of first enrollment until all requirements for the degree are completed. Continuous enrollment may be maintained by registering in one of the following categories: 1. Full-time enrollment (more than 6 credits); 2. Part-time enrollment (6 credits or less); 3. Graduate leave status enrollment.

Enrollment in categories 1 or 2 automatically will grant graduate leave status enrollment for the ensuing two terms (semester or summer session) at no charge. Further graduate leave status enrollment may be granted for a fee of $31.00 per calendar year. Graduate leave status enrollees who wish to enroll for credit must give the Graduate School one month notice prior to the enrollment date. Graduate students who fail to maintain continuous enrollment will be dropped from the university.

Special Projects or Independent Study (600), Master's Research, Thesis, and/or Examination (700), Master's Special Problems, Directed Study, and/or Examination (702), and Doctoral
Research, Dissertation, and/or Examination (800) shall have as prerequisite regular student status in the Graduate School. Research or special problems done through an enrollment by mail basis must be accomplished without utilizing the facilities of Washington State University. Inquire at the Registrar’s Office concerning procedures for enrollment by mail registration.

Registration Policy for Graduate Students Completing Degree Requirements
Graduate students will be required to register during the semester or summer session in which their degrees are officially awarded. Fall and spring semesters and summer session officially end at the time final grades are due in the Registrar’s Office. Students who schedule final master’s or doctoral oral examinations in the interim non-class period after the end of a term will be required to register for the following semester or summer session. This policy was approved by the Graduate Studies Committee and appropriate university officials and was effective June, 1982.

Scholarship Standards
A student must earn a 3.00 grade point average for all course work (including all courses listed on the program and other graduate upper- and lower-division courses). No work of C grade or less may be dropped from a program, nor can a course be repeated for a higher grade if the final grade is C or higher. Any course listed on the program in which a grade of C-, D or F is earned must be repeated.

Any graduate student who fails to maintain a cumulative grade point average of 3.00 or higher for all course work subsequent to admission to the Graduate School will be dropped from the university. A student who is dropped may be permitted to re-enroll if a special recommendation is made by the chairperson of the major department with the concurrence of the Dean of the Graduate School.

Requirements for a Graduate Degree
The graduation requirements of the Graduate School as published in the Graduate Study Bulletin in effect at the time of the student’s initial admission as a regular or provisional graduate student are those which must be met for completion of a graduate-degree program. Departmental requirements for graduation are those in effect at the time the student files a program.

Subsequent changes in degree requirements of the Graduate School or in departmental requirements may be substituted at the option of the student upon approval by the master’s or doctoral committee, by the department chairperson, and by the Dean of the Graduate School.

If a student is dropped from the university for failure to maintain continuous enrollment, the graduation requirements of the Graduate School are those in effect at the time of readmission to the Graduate School.

Time Limit
The time limit for the use of graduate credits toward a master’s degree is six years from the beginning date of the earliest course applied toward the degree.

Each program for a doctor’s degree is considered individually. In all cases, work for the degree must be completed within three years of the date of the satisfactory completion of the preliminary examination. At least four months must elapse between preliminary and final examinations for doctoral degrees.

Assistantships, Fellowships, and Scholarships
Teaching and research assistantships are available in most departments offering advanced degrees, and research fellowships are granted in some departments. For the student personnel program, staff assistants are appointed each year. The Graduate Study Bulletin should be consulted concerning qualifications, eligibility, and application procedures.

Assistantship appointments require part-time service. Students on appointment must maintain regular enrollment in Graduate School for the duration of their appointments. Stipends vary ac-
According to the amount of required service, the extent of the student's training, and other factors, Graduate students appointed to assistantships of one-half time service or more by the Board of Regents, and who reside in the state of Washington while attending WSU, are exempt from nonresident registration fees, but are required to pay the resident tuition and fees. Forms for assistantship or fellowship applications are included as part of the general application for admission to Graduate School.

As most appointments are made by April 1, it is desirable to have applications completed by March 15.

Washington State University subscribes to the following resolution of the Council of Graduate Schools in the United States regarding scholars, fellows, trainees, and graduate assistants. "Acceptance of an offer of financial aid (such as a graduate scholarship, fellowship, traineeship, or assistantship) for the next academic year by an actual or prospective graduate student completes an agreement which both student and graduate school expect to honor. In those instances in which the student accepts the offer before April 15 and subsequently desires to withdraw, the student may submit in writing a resignation of the appointment at any time through April 15. However, an acceptance given or left in force after April 15 commits the student not to accept another offer without first obtaining a written release from the institution to which a commitment has been made. Similarly, an offer by an institution after April 15 is conditional on presentation by the student of the written release from any previously accepted offer. It is further agreed by the institutions and organizations subscribing to the above Resolution that a copy of this Resolution should accompany every scholarship, fellowship, traineeship, and assistantship offer."

For information about special scholarships and fellowships write to the Dean of the Graduate School or the chairperson of the department concerned.

Joint Center for Graduate Study at Richland

Jerome W. Finnigan, Dean

The Joint Center for Graduate Study at Richland, Washington, is a multi-institutional education center administered jointly by Washington State University and the University of Washington. Oregon State University also participates in the academic program. The center provides for these universities a means of delivering graduate and upper-division education to the Hanford area professionals, and to the public in the Tri-Cities region.

Through the center, with approval by the university, students can earn an advanced degree in biology, chemistry, computer science, education, electrical engineering, and materials science and engineering. The Department of Energy Hanford Laboratories are available for research purposes by individual arrangement and provide an exceptional opportunity to do research requiring facilities not available at most institutions of higher learning. Graduate and postdoctoral fellowships and faculty appointments are available for qualified persons who wish to do research at Richland. These are administered through the center.

Graduate students who plan to use course work and research undertaken through the center as a part of a program for a graduate degree at Washington State University must be admitted to the WSU Graduate School. Requirements and regulations are generally identical with those applicable to graduate students on the campus in Pullman.

Residence Requirements
Credit earned at the Joint Center for Graduate Study will be considered as Washington State University credit. Students who are candidates for the master's degree in programs sponsored by WSU listed above may petition the Dean of the Graduate School for permission to be excused from the residency requirement. Petitions for being excused from the residency requirements,
which must be completed when applying for a degree, must be approved by the student's adviser and the sponsoring program coordinator prior to being presented to the Graduate School.

Requests for information concerning the activities and the programs of study and research at the center, availability of facilities, admission to activities, and for copies of the center's bulletin containing general information and course offerings should be addressed to: Dean, Joint Center for Graduate Study at Richland, Richland, Washington 99352.

Intercollegiate Center for Nursing Education

Thelma L. Cleveland, Dean

Washington State University is the coordinating institution of a unique three member consortium program in nursing education, the first of its kind in the United States. Other institutional participants in the program are Eastern Washington University, Cheney and Whitworth College, Spokane.

The nursing major is designed to prepare practitioners and leaders in nursing who will be self-directing and responsible for making continuing contributions to the health care of individuals, families and communities in collaboration with other health professionals. To achieve these goals, the professional curriculum is built upon a foundation of physical, biological, and psychosocial sciences as well as the humanities. Acquisition and implementation of the knowledge and skills essential for professional nursing practice is emphasized in nursing courses.

The program is accredited by the National League for Nursing and approved by the Washington State Board of Nursing. The Intercollegiate Center for Nursing Education is a member of the Council on Baccalaureate and Higher Degree Programs of the National League for Nursing and of the American Association of Colleges of Nursing.

The curriculum prepares graduates for professional practice in a variety of roles and settings. Many nurses practice in hospitals, community health agencies, extended care facilities, nursing homes, clinics, industry, and psychiatric mental health institutions and centers. Others are developing roles in new settings in the community. The curriculum provides a foundation for graduate study and careers in advanced and specialized clinical nursing practice, nursing education, administration, research and consultation.

The program is open to students beginning a nursing career and registered nurses who wish to obtain a baccalaureate degree in nursing. Men and members of ethnic groups seeking a role in the health professions find that nursing provides a most rewarding career. Members of these groups are actively recruited.

In keeping with its belief that nurses are accountable to the consumer and to their colleagues for acquiring and maintaining competencies which will insure excellence in nursing practice, the Intercollegiate Center for Nursing Education provides continuing education offerings for practicing registered nurses.

Admission

The curriculum in nursing consists of lower- and upper-division components and is four academic years in length. The length of the program for registered nurses varies depending upon previous education and the course load carried at the university.

The first two years of the curriculum (lower-division component) are completed on the Pullman campus or may be taken at any institution offering courses equivalent to those taught at Washington State University. Applicants to the nursing program must meet the admission requirements of Washington State University. The following high school subjects are recommended for students planning a career in professional nursing: English, mathematics, science (chemistry, biology and/or physics), social sciences, and foreign language. If two years of one foreign language are not completed in high school, the student must complete one year of a foreign language on the college level.
The last two years of professional study (upper-division component) are provided at the Intercollegiate Center for Nursing Education in Spokane. In addition, the upper-division courses are offered in Yakima through the Office of Continuing University Studies (OCUS). Students are selectively admitted into the upper-division nursing major twice a year. They must submit an "Application for Admission to the Intercollegiate Center for Nursing Education." Application forms can be obtained from and must be returned to the Office of Admissions at Washington State University between December 1 and February 15 preceding the fall term or July 15 and October 1 preceding the spring term in which the applicant plans to enroll.

Admission to the Intercollegiate Center for Nursing Education is based upon the evaluation of the student’s entire application, including academic record, letters of reference, and basic mathematical proficiency. Since the number of applicants to the center exceeds the number that can be admitted, no assurance can be given that all applicants admitted to the university and successfully completing the lower-division requirements will be admitted to the center.

Transfer Students

Upon successful completion of the first two years of required course work, and admission to Washington State University, the student is eligible to apply for entrance to the upper-division component at the Intercollegiate Center.

Applicants for admission to the center must present 60 semester hours or 90 quarter hours of acceptable credit from an accredited college or university. The credits must include courses that meet General University Requirements for Graduation and the additional requirements of the College of Sciences and Arts as listed in this catalog. Registered nurse applicants must be graduates of an approved community college or hospital school of nursing and be currently licensed or eligible for licensure to practice in the state of Washington at the time of application. Transfer students must apply to the Office of Admissions at WSU by December 1 or July 15 and complete the "Uniform Undergraduate Application for Admission to Four-Year Colleges," as well as an "Application for Admission to the Intercollegiate Center for Nursing Education," both of which can be obtained from that office. Applicants for the Yakima site complete the "WSU/OCUS Application" in lieu of the "Uniform Undergraduate Application for Admission to Four Year Colleges." Application forms and a separate official transcript from each collegiate institution attended should be filed between December 1 and February 15 for the fall term or July 15 and October 1 for the spring term. Students enrolled in colleges on the quarter system must also send a transcript immediately after winter term and no later than April 1, or after fall term and no later than January 1. A final transcript must be in the Office of Admissions before July 1 or February 1.

It is advisable that students planning to transfer check early in their program, preferably during their freshman year, with the Lower Division Nursing Adviser, 236 Morrill, Washington State University, Pullman, Washington 99164. The latest date for receipt of intention to apply is December 1 or June 1. Students are accepted to the center twice a year.

Degree

The programs of study lead to the degrees of Bachelor of Science in Nursing and Master of Science in Nursing.
Larry M. Simonsmeier, Dean

The College of Pharmacy has as its objective the development of students for a lifetime of responsible service in the pharmaceutical profession. To achieve this goal, the professional curriculum is built upon a solid foundation of general sciences and mathematics and is integrated with courses in the humanities and social sciences. During the professional years of instruction, special attention is given to developing in students concern for the total health care of patients and the general public. The clinical pharmacy program on campus and in cooperating hospitals of the area emphasizes the role of the pharmacist in patient care both in institutions and in community practice. The preclinical basic science courses are carefully designed to prepare students for such experience. The College of Pharmacy is accredited by the American Council on Pharmaceutical Education and is a member of the American Association of Colleges of Pharmacy.

The curriculum of the College of Pharmacy is designed to prepare graduates for a variety of professional careers. A majority of pharmacists practice the profession in community pharmacies. Successful community pharmacists particularly enjoy meeting the public and looking after and advising individuals of their health needs. The hospital pharmacist is becoming an increasingly important person on the health-care team. The hospital pharmacist, as well as the community pharmacist, is accepting new responsibilities in assuring that patients receive the best possible drug therapy. Other pharmacists hold responsible positions in the manufacturing industry as production supervisors, researchers, and medical service representatives; in government positions; in teaching and institutional research.

The College of Pharmacy operates an active program for the recruitment of students who are members of minority groups. Special programs of financial aid, academic advising and tutorial services are available for such students needing help.

Admission

The schedule of studies in pharmacy at Washington State University is divided into one prepharmacy or preprofessional year, and four professional years.

The year of preprofessional studies may be taken at WSU, or at any accredited college or university having equivalent courses. Not less than 30 semester credit hours or 45 quarter credit hours should be completed during the preprofessional year; these should include courses equivalent to the WSU courses in the following list. Information concerning the acceptability of course credits may be obtained from the Office of Admissions.

<table>
<thead>
<tr>
<th>WSU Courses</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bio S 103, 104 Introductory Biology</td>
<td>8</td>
</tr>
<tr>
<td>Chem 105, 106 General Chemistry</td>
<td>7</td>
</tr>
<tr>
<td>Chem 107 Qualitative Analysis</td>
<td>2</td>
</tr>
<tr>
<td>Math 140 Math for Life Scientists</td>
<td>4</td>
</tr>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Humanities or Social Science Electives</td>
<td>6</td>
</tr>
</tbody>
</table>

Students entering WSU as freshmen with an intent to major in pharmacy are advised to indicate this fact when enrolling as students in the Curriculum Advisory Program. Prepharmacy students are counseled and advised by members of the pharmacy faculty. In special cases a student who has completed all of the non-professional courses scheduled for the prepharmacy and first professional years of study may be admitted directly into the second professional year of study.

All students seeking admission to the College of Pharmacy, including WSU students as well as students from other institutions, must file an Application for Admission with Advanced Standing which may be obtained from and should be returned to the Office of Admissions during the period of December 1 to March 1. Students who wish to make special inquiries about the College of Pharmacy program should contact the Dean of the College.

Determination of admission to the College of Pharmacy will be based upon the student's academic record, test results, recommendations, and a personal interview. Students who may find it difficult to come to Pullman for an interview may make arrangements through the College of
Pharmacy for an interview with a representative of the College of Pharmacy in the area in which they live. The race, sex, religion, age, color, creed, national or ethnic origin, marital status, and handicap of the applicant is not considered in the admission process. Because the number of applicants to the professional program exceeds the number that can be admitted, no assurance can be given that those who successfully complete the prepharmacy program will be admitted to the college.

A student applying for admission with advanced professional standing from another accredited pharmacy college must present evidence of good standing in the previous school and an acceptable cumulative grade point average and at least a 2.00 grade point average in pharmacy subjects. In addition, the student must present a letter of recommendation from the dean of the pharmacy college previously attended.

Degrees
The College of Pharmacy offers programs of study leading to the degree of Bachelor of Pharmacy, and it participates in an interdisciplinary graduate program offering the Master of Science and Doctor of Philosophy degrees in Pharmacology/Toxicology.

It is possible by special arrangement of courses and by careful selection of electives for a candidate for a Bachelor of Pharmacy degree to be concurrently a candidate for a Bachelor of Science degree. Such a student must fulfill the requirements of the second department as well as those of the College of Pharmacy.

College of Sciences and Arts

Lois DeFleur, Dean, Division of Humanities and Social Sciences
Robert A. Nilan, Dean, Division of Sciences

As a bearer of the tradition of liberal education, the College of Sciences and Arts places much importance upon soundly conceived and well-taught courses so developed as to give a properly balanced presentation of the basic areas of human endeavor. Students are assured a nucleus of courses in humanities, social sciences, biological sciences, and physical sciences, a knowledge of at least one foreign language and a concentration of subject matter in the major and minor fields. As the interests of students develop, they are encouraged to supplement their programs with elective courses of special cultural values such as those in art, literature, and music.

The College of Sciences and Arts offers a number of programs that prepare students for various professions and vocations. Graduate, as well as undergraduate, work is offered by most departments.

Students who plan to do advanced work beyond the bachelor's degree should plan their programs so as to meet the requirements for admission to a graduate school. The college has the responsibility to provide course work in the humanities, sciences, and social sciences for students who major in the other colleges on the campus. In this respect an important service function is fulfilled.

A number of curricula are offered to give preprofessional training to students who then will enter professional schools. At the same time these curricula are designed to provide a basic liberal education. Washington State University is on the approved list of the American Chemical Society. The graduate training program in clinical psychology is accredited by the American Psychological Association. The environmental option in bacteriology and public health was the first approved by the National Association of Environmental Health. The Department of Music is a member of the National Association of Schools of Music.

The college, in cooperation with the Department of Education, prepares teachers for all levels of educational work. Students preparing for teaching at the elementary, secondary, and college
levels usually have the course work in their chosen subject-matter fields within the College of Sciences and Arts. The specific requirements for certification and teaching majors and minors are listed under the Department of Education.

Admission
The requirements for admission to the College of Sciences and Arts are the same as those for Washington State University.

High school students should include the following subjects as preparation for work in the College of Sciences and Arts: four years of English, two years of one foreign language, two years of mathematics, two years of science, two years of social studies. Students interested in the biological, physical, or social sciences should have a third year of mathematics and a third year of science. For students interested in the humanities, participation in music, art, speech and communications is recommended.

Requirements for Graduation
The requirements for graduation include the General University Requirements for Graduation, plus additional Sciences and Arts requirements in the humanities, social sciences, and sciences. See graduation requirements on page 32 of this bulletin.

Departments and Programs
The College of Sciences and Arts is organized by departments and programs under two divisions.

The Division of Humanities and Social Sciences
Anthropology, communications, criminal justice, English, fine arts, foreign languages and literatures, history, music, philosophy, political science, psychology, sociology, and speech. In addition, several special curricula are offered and are listed alphabetically in this catalog as follows: aging, American studies, Asian American studies, Black studies, Chicano studies, East and South Asia, general studies (classics, humanities, social science, liberal arts, linguistics, religious studies), literary studies, Native American studies, prelaw, social studies, social work and women studies.

The Prelaw Advising Center is located in the Department of Political Science. Other prelaw curricula are offered through such departments and programs as English, history, and classics.

The Division of Sciences
Bacteriology and environmental health, basic medical science, biochemistry and biophysics, botany, chemistry, computer science, environmental science and regional planning, general biology, genetics and cell biology, geology, pure and applied mathematics, physics, and zoology (including physiology and wildlife biology). In addition, several special curricula are offered and are listed alphabetically in this catalog as follows: general studies (physical science, biological science, mathematics), chemical physics, predental, premedical, and environmental science, several of which are offered jointly with other colleges of the university.

Degrees
The College of Sciences and Arts offers programs of study leading to the following degrees:

<table>
<thead>
<tr>
<th>Degree</th>
<th>Department or Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor of Arts</td>
<td>American Studies, Anthropology, Asian Studies, Black Studies, Chicano Studies, Communications, Criminal Justice, English, Fine Arts, Foreign Languages &amp; Literatures, History, Humanitieas, Music, Philosophy, Political Science, Social Sciences, Social Studies, Sociology, Speech</td>
</tr>
<tr>
<td>Bachelor of Music</td>
<td>Music</td>
</tr>
<tr>
<td>Bachelor of Science</td>
<td>General Studies</td>
</tr>
<tr>
<td>--------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Bachelor of Science</td>
<td>Bacteriology and Public Health, Biochemistry, Biology, Chemistry, Computer Science, Environmental Science, Geology, Mathematics, Physics, Psychology, Wildlife Biology, Zoology</td>
</tr>
<tr>
<td>Master of Arts in the Teaching of Speech</td>
<td></td>
</tr>
<tr>
<td>Master of Fine Arts</td>
<td>Fine Arts</td>
</tr>
<tr>
<td>Master of Regional Planning</td>
<td>Regional Planning</td>
</tr>
<tr>
<td>Master of Science</td>
<td>Bacteriology and Public Health, Biochemistry, Biology, Botany, Chemistry, Computer Science, Environmental Science, Genetics and Cell Biology, Geology, Mathematics, Physics, Psychology, Wildlife Biology, Zoology</td>
</tr>
<tr>
<td>Doctor of Philosophy</td>
<td>American Studies, Anthropology, Bacteriology, Biochemistry, Botany, Chemical Physics, Chemistry, Computer Science, English, Genetics and Cell Biology, Geology, History, Literary Studies, Mathematics, Physics, Political Science, Psychology, Sociology, Zoology, Zoophysiology</td>
</tr>
<tr>
<td>Doctor of Arts</td>
<td>Mathematics</td>
</tr>
</tbody>
</table>

# College of Veterinary Medicine

Leo K. Bustad, Dean

The curriculum of the College of Veterinary Medicine prepares students for positions in the many fields of veterinary medicine, e.g., private practice, U.S. Public Health Service, federal and state disease regulatory programs, industry, teaching, research, and military medicine. Areas studied include animal health, disease eradication, comparative pharmacology and toxicology, environmental sciences, laboratory animal medicine, and comparative biomedical studies to help resolve human disease problems.

The professional degree, Doctor of Veterinary Medicine, is recognized by all state and territorial licensing boards, as well as those in foreign countries.

The College of Veterinary Medicine is accredited by the American Veterinary Medical Association.

**Admission**

Seven years are usually required to obtain the degree of Doctor of Veterinary Medicine. However, an exceptional student may complete the preprofessional requirements in two years. The first two years of preveterinary training can be taken at any institution having courses equivalent to those taught at Washington State University. Additional work must be taken at an accredited four-year institution and the last four years are professional study directed by the College of Veterinary Medicine.
Applicants for admission to the College of Veterinary Medicine must present at least 75 semester hours of acceptable credits from an accredited college or university exclusive of military training and physical education. The 75 semester hours should include: 6 semester hours of social science and 6 semester hours of humanities; 6 hours communications proficiency (general university requirements for graduation); 45 hours including zoology or general biology, inorganic and organic chemistry, biochemistry, physics, mathematics, applied animal nutrition and 12 hours of electives. The 60 semester hours can be taken at a community college.

Information regarding the acceptability of course credits should be obtained from the Director of Admissions.

Courses designed to fit these requirements are offered by Washington State, and the number of students admitted to preprofessional work is not limited. Since the number of applicants for admission to the professional course exceeds the number that can be admitted, no assurance can be given that all applicants who successfully complete the preprofessional curriculum will be admitted.

A major in veterinary medicine is not declared until admission to the College of Veterinary Medicine has been granted.

Students seeking to enter the four-year professional program must fill out a "Uniform Undergraduate Application for Admission," as well as a WOI Program application, both of which may be obtained from, and should be returned to, the Office of Student Services, College of Veterinary Medicine, Washington State University, Pullman, Washington 99164. These, plus a $15 application fee and two separate official transcripts from each collegiate institution attended, should be filed with the Office of Student Services between August 1 and November 1 preceding the fall semester in which the applicant wishes to enroll. A transcript of the spring semester’s credits must be in the Office of Student Services before July 1. The records of all qualified applicants are submitted to the WOI Admissions Committee. The committee, with the approval of the Board of Regents, selects those students to be admitted to the first year of the professional program. Applicants will be notified of their acceptance or denial on or before April 1. Unsuccessful applicants who wish to be considered the next year must present new applications.

In accordance with policies adopted by the Board of Regents, preference for admission to the College of Veterinary Medicine is as follows:
1. To qualified students coming from homes in the states of Washington, Idaho, and Oregon.
2. To qualified students certified and financed by compact states.
3. To all other qualified students.

Western Regional Higher Education Compact

The College of Veterinary Medicine at Washington State University has entered into a regional educational program with the states of Alaska, Arizona, Hawaii, Montana, New Mexico, Utah, and Wyoming. Under the terms of this compact, a certified student admitted from one of these states is sponsored financially by the home state and is subject to the same fees as Washington resident students.

Students must apply to their home state for certification in addition to making application to the Director of Admissions, Washington State University. Additional information regarding regional veterinary education may be obtained from the following:

The Executive Director
Western Interstate Commission for Higher Education
P.O. Drawer P
Boulder, Colorado 80302

WOI Regional Program in Veterinary Medical Education

Washington State University has agreed to engage in a regional program in veterinary medicine with the University of Idaho and Oregon State University. The regional program involves instruction on the WSU campus, at the Caldwell Station (Idaho), and on the Oregon State Uni-
versity campus. Specific quotas of students from Idaho and Oregon have been established under the terms of this agreement.

**Degrees**

The College of Veterinary Medicine offers courses of study leading to the degrees of Doctor of Veterinary Medicine, Bachelor of Science in Veterinary Science, Master of Science in Veterinary Science, and Doctor of Philosophy (Veterinary Science).
Courses listed in this catalog are subject to change through normal academic channels. New courses and changes in existing course work are initiated by the cognizant departments or programs, approved through the appropriate academic dean, the Catalog Subcommittee, the Academic Affairs or Graduate Studies Committee, and the University Senate. Additions to the curriculum for the ensuing year are published each fall in the Catalog Supplement.

**SYMBOLS**

210 (101) indicates number change, the old number in parenthesis.

3 number following course title indicates the hours of credit.

(2-3) numbers in parenthesis following the credit hours indicate the contact hours of lecture, followed by laboratory, or studio hours required each week during a semester.

a/y course is offered on alternate years only.

c// concurrent enrollment.

V 1-4 the letter “V” preceding the credit indicates the course is approved for variable credit within the semester.


**Adult and Continuing Education**

Professor and Chair, C. A. Pettibone; Professors, J. H. Cooper, A. D. Hill, H. L. Low, T. F. Trail, L. B. Urdel, R. E. Young, R. J. Young; Associate Professors, J. S. Long, G. H. Marling; Assistant Professor, R. M. Jimmerson.

Adult and Continuing Education (ACE) is involved with the many areas of learning needed by adults to meet the complex problems of a changing world. Students in this program will develop skills in designing and using teaching strategies appropriate to adults, and will gain an understanding of the role of the adult in society and the influences affecting adult education. They will also learn to analyze the educational needs of adults and to involve them in the development and evaluation of meaningful educational and vocational programs. Research design and analysis are integral parts of every program.

The program of studies leading to the Master of Adult and Continuing Education (M.A.C.Ed.) is administered jointly by the Colleges of Education and Agriculture with maintenance of close relationships with a number of other university units in order to augment the teaching, public service, and research functions of adult education. ACE faculty prepare qualified students for employment as adult basic education and community college teachers and administrators; county extension agents; communications specialists; directors of local governmental and volunteer agencies; rural development specialists; and planners and coordinators of programs in business and industry.

In addition to the courses listed below, students may also select from Educ 501, 502, 505, 507, 576, and VTE 512 to fulfill requirements. Elective courses from various departments allow the student to meet individual goals. Detailed degree requirements are outlined in the Graduate Study Bulletin.

**Description of Courses**

For explanation see Index under "Symbols"

ACE

510 Development and Evaluation of Adult Education Programs 3 Development,
implementation, and evaluation of adult education programs.

511 Seminar 1 or 2 May be repeated for credit.

514 Adult Learning 3 By interview only. Theories, principles, concepts, and practices that apply to adult learning.

515 Teaching Methods 3 Methods and procedures of informal adult and continuing education.

516 Methods of Research in Adult Education 2 Prereq two courses in ACE. Methods of research and design of studies in adult and continuing education.

525 Foundations of Community Education 3 Same as Educ 525.

526 Community Education Resources for Problem Solving 3 Same as Educ 526.

600 Special Projects or Independent Study Variable credit.

700 Master's Thesis, Thesis and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

General Military Course (GMC). This sequence of courses consists of four one-credit courses normally taken during the freshman and sophomore years. The GMC sequence prepares the student for field training and the POC, and forms the basis for the four-year program. The sequence may be adapted to fit individual schedules.

Professional Officer Course (POC). This sequence, beginning with Aero 311, consists of four three-credit courses normally taken during the student’s last two years in the university. Entry into the POC is competitive. Four-year students compete for entry during their last semester in the GMC. Students interested in the two-year program should begin application by the end of the fall semester before they plan to enter the POC. Four- and two-year students selected for entry will be scheduled to attend Aero 291 or 292 during the summer before enrolling in Aero 311.

Flight Instruction Program (FIP). This is a two-credit course that covers the ground phase of flying; it is open to all university students. AFROTC cadets who are designated to become pilot candidates will enroll in this program and will receive 13 hours of flying and ground school instruction at no cost to the cadet.

Financial Aid and Scholarships. Air Force ROTC offers enrolled GMC students the opportunity to compete for three- and two-year scholarships which pay tuition, fees, and textbooks as well as a $100 per month stipend during Fall and Spring Semesters. Two-year program applicants can compete for a two-year scholarship. All Air Force ROTC students regularly enrolled in the POC receive the $100 per month stipend.

Description of Courses

For explanation see Index under “Symbols”

General Military Course

Aero

101 United States Aerospace Forces 1 (1-1) Structure and capabilities of the U.S. aerospace strategic and defensive air forces; relationship of the individual to the Air Force.

102 United States Aerospace Forces 1 (1-1) Structure and capabilities of the U.S. aerospace general purpose and support forces; responsibilities and opportunities of the Air Force officer.

201 Evolution of Aerospace Power 1 (1-1) Growth and development of airpower
doctrines and concepts from the origins of manned flight through World War II.

202: Evolution of Aerospace Power 1 (1-1)
Development of airpower, doctrine, concepts from the Berlin Airlift to today; peaceful employment of airpower as a force for stability.

Field Training
Aero
291: Four-Week Field Training Course 2
Prereq: junior standing; Aero 101, 102, 201, 202. By interview only. Intensive study of the military education, experience in leadership and management at an active Air Force installation.

292: Six-Week Field Training Course 6
Prereq: junior standing. By interview only. Applicants must apply at least six months in advance. Intensive study of academic core course work and military education at an active Air Force installation.

Professional Officer Course
Aero
311: Air Force Leadership 3 (3-1)
Prereq: Aero 292 or 291. Professional leadership, responsibilities and functions required of career Air Force officers; communicative skills.

312: Air Force Management 3 (3-1)
Management principles and functions pertaining to command and supervision; case histories and case studies.

411: The Professional Military Officer 3 (3-1)
Military officer's as a profession, the role of national security forces in the U.S. and military law.

412: National Security Forces in Contemporary American Society 3 (3-1)
Defense strategy and conflict management; formulation and implementation of U.S. defense policy, including case studies; communicative skills.

456: Flight Instruction Program V 2 to 3
Ground phase; flight theory, meteorology, FAA regulations, navigation. Flying phase is for AFRTOC pilot candidates only.

499: Special Problems V 1-4
May be repeated for credit.

Program in Aging

Chair, D. Z. Price.

The Program in Aging offers an interdisciplinarily curriculum in gerontology, including courses in the social and health sciences. The program is designed to achieve the following objectives:

1. To provide a body of knowledge which individuals may use in better understanding the processes and implications of aging in their own lives and for participation in community decision-making regarding the scope, structure, and nature of programs for the elderly;
2. To enhance the qualifications of students in the helping services, health sciences, communications, education, and business, who are planning careers which involve working with or providing services to older persons;
3. To prepare students for graduate and professional training in gerontology;
4. To further university and societal goals of equity for persons of all ages.

The program offers a minor in Aging. The minor requires a minimum of 18 hours of credit including Aging/CFS 320, HNF/Aging 130, Psych/Aging 363, Soc/Aging 356, and an approved aging-related course in the health sciences.

Description of Courses

For explanation see Index under “Symbols”

Aging
130: [Z] Nutrition for Man 3 Same as HNF 130.
320: Perspectives on Aging 3 Same as CFS 320.
321: Topics in Aging 2-3 May be repeated for credit; cumulative maximum 6 hours. Prereq: Aging/CFS 320.
356: [F] Sociology of Aging 3 Same as Soc 356.
363: Psychology of Aging 3 Same as Psych 363.
499: Special Problems V 1-4 May be repeated for credit.

Department of Agricultural Economics


Agricultural economics is frequently referred to as the business side of agriculture. In agricultural economics courses, students learn to use economic and business concepts along with technical production information to solve problems of agricultural business firms and organizations. They also obtain knowledge and skills relevant to solving broader economic and social problems facing agriculture and society in general.

The major fields of emphasis in agricultural economics include agricultural policy, economic development, resource economics, production economics, farm and agricultural-business management, quantitative methods and agricultural marketing.

Students majoring in agricultural economics may emphasize one or more of the fields within agricultural economics, or may obtain a general background in agricultural economics. Also, a wide variety of courses is available to nonmajors who want to take selected courses to support their programs in other departments.

Majors in agricultural economics find employment in private industry, in government agencies, and with universities. Opportunities to work in foreign countries are also often available. Graduates find a wide variety of career opportunities such as farm operators, professional farm or agri-business managers, county agricultural agents, agricultural representatives for financial institutions, market analysts, field representatives for agri-business firms, economists for state and federal agencies, and foreign agricultural specialists. A number of students take graduate work to broaden their career opportunities.

The department offers courses of study leading to the degree of Bachelor of Science in Agricultural Economics, Master of Arts in Agricultural Economics, and Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Ag Ec

201 [S] Economics in Agriculture 3 General introduction to economics appropriate for production, consumption and ecological issues in the agricultural and rural sector of the economy.

210 Agricultural Information System 1 (0-3) Sources of data used in agricultural economics; basic methods of interpreting, analyzing, and presenting economic information.

301 [S] Structure and History of the American Agricultural Economy 3 Agriculture in evolution toward a modern economy; organizational nature of firms, land settlement, and farmer participation in national affairs.

335 Legal Problems of Agriculture 3 An introduction to the nature and extent of common legal problems confronting Washington farmers and ranchers.

340 Introduction to Farm and Ranch Management 3 Prereq Ag Ec 201 or Econ 203. Appraisal, organization, and management of related types of farms and ranches.

350 Introduction to Agricultural Marketing 3 Prereq Ag Ec 201 or Econ 203. Problems of marketing farm products; functions and institutions surrounding market operations.

360 Introduction to Agricultural Supply and Marketing Business 3 Prereq Ag Ec 201 or Econ 203. Product combinations, resource allocations, personnel, finance, and related problems in the operation of agri-business firms.

361 Farm and Natural Resources Appraisal 3 Prereq Econ 102, 203; Ag Ec 340. Factors affecting value of land; valuation for loans, sales assessment and condemnation. Field trips required. Cooperative course taught at the University of Idaho.

370 Agricultural Prices 3 Prereq Ag Ec 201 or Econ 203; one statistics course. Factors determining levels and movements of prices in agricultural commodities.

380 Introduction to Resource Economics 2 Prereq Ag Ec 201 or Econ 203. Introduction to resource scarcity, use, and control; resource problems as they relate to rural areas.

408 Mathematics for Economists 3 Same as Math 408.

410 Applied Statistical Methods in Agricultural Economics 3 Prereq Math 201, 202; one statistics course. Application of sampling techniques, linear regression and analysis of variance and covariance to agricultural economics research problems.

411 Applied Operations Research Techniques in Agricultural Economics
Prereq Math 201, 202; one statistics course. Quantitative methods used by agricultural economists; linear programming; transportation models.

420 International Agriculture and Economic Development 3 Prereq Ag Ec 201 or Econ 203. Nature and roles of agricultural development, trade and institutions.

425 Economic Analysis of Projects and Programs 3 Prereq 300-level course in Econ or Ag Ec. Principles and procedures for valuing project effects, estimating distributional and environmental consequences, and making social choices; case studies.

430 Financial Arrangements in Agriculture 3 Prereq Ag Ec 340; one accounting course. Personal and business finance in the agricultural economy, insurance, retirement, amortization and interest.

440 Advanced Farm Management 3 Prereq Ag Ec 340 or Econ 301; one statistics course. Economic principles applied to organization and operation of farms and ranches.

450 Advanced Agricultural Marketing 3 Prereq Ag Ec 350 or 370 or Econ 301; one statistics course. Institutions, practices, policies, and problems in agricultural input and output marketing. Credit not granted for both Ag Ec 450 and 550.

460 Advanced Agricultural Supply and Marketing Business 3 Prereq Ag Ec 360 or Econ 301. Alternatives in the market behavior of firms that handle, process, and trade in agricultural inputs and outputs.

480 Advanced Resource Economics 3 Prereq Ag Ec 380 or Econ 301. Economic principles applied to problems of natural resource utilization, development, and conservation.

490 Agricultural Policy 3 Prereq Ag Ec 201 or Econ 203. Public policy issues related to commercial agriculture and rural areas.

497 Agribusiness Internship V 1-4 May be repeated for credit. By interview only. Off-campus work-study in agriculture.

498 Seminar 1 May be repeated for credit. For seniors. Current problems.

499 Special Problems V 1-4 May be repeated for credit.

502 Economics of Public Choice in Agriculture and Natural Resources 3 Prereq Econ 401, 501. Basic concepts of economics of public choice and their application to public policy in agriculture, rural areas and natural resources.


511 Matrix Research Techniques 3 Mathematical programming applications of duality, parametric programming, inverse matrix methods, transportation problems, game theory, quadratic, integer, separable and dynamic programming.

512 Advanced Topics in Applied Problem Analysis of Agricultural Economics Data 3 Prereq Ag Ec 410, 510. Model construction and estimations for analysis of agricultural supply and demand problems. (a/y)

520 Economic Development and Trade in Agriculture 3 Nature and roles of agricultural development and trade; concepts of sectors, regions, and interregional relationships. (a/y)

521 Seminar in Agricultural Economics 1-3 May be repeated for credit; cumulative maximum 6 hours. Current topics in agricultural development, marketing, farm management, and agricultural policy.

540 Agricultural Production Economics 3 Theoretical economic concepts applied to analysis of agricultural problems, production intensity, factor and product combination, uncertainty and technological change.

541 Advanced Agricultural Production Economics 3 Prereq Ag Ec 408, 540. Current multiple product production theories and functions applied to agricultural policy issues. (a/y)

550 Advanced Agricultural Marketing 3 Graduate level counterpart of Ag Ec 450; additional requirements. Credit not granted for both Ag Ec 450 and 550.

551 (550) Market Organization and Structure 3 Prereq Ag Ec 450 or 550. Analysis of marketing research tools and applications; theoretical concepts of marketing as modified by cultural, institutional, and economic systems. (a/y)

580 Resource Economics 3 Problems and issues in natural resource use, development, and conservation. (a/y)

581 Seminar in Resource Economics 2 Cur-
rent policy issues, methods of evaluation and resource agency procedures and practices. (a/y)

590 Public Policy and Agriculture 3 Agriculture’s role in public economic policy. (a/y)

600 Special Projects or Independent Study Variable credit.

700 Master’s Research, Thesis, and/or Examination Variable credit.

702 Master’s Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

General Departmental Requirements

The following schedules set forth the general requirements for the three departmental undergraduate curricula. General University Requirements are met in the department requirements listed for all three curricula. Students should consult their advisers for the appropriate sequencing of courses as well as for the selection of electives that best suit their needs and interests. Illustrative programs are available from the department.

At least 40 of the total hours required for the bachelor’s degree in these programs must be in upper-division courses.

Management Curriculum

This option has been developed for the student who wants to specialize in management. Emphasis is placed on the principles of management for both farm and nonfarm agricultural businesses. The program permits in-depth inquiry into management and decision-making tools, and flexibility enough to permit an integrated complement of courses to fulfill an individual student’s needs.

Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Ec 340, 350, 360, 440, 450, 460, six of which must be in the same sequence</td>
<td>21</td>
</tr>
<tr>
<td>QMeth 215, Biom 310, or Biom 412</td>
<td>3-4</td>
</tr>
<tr>
<td>QMeth, Cpt S elective, or Ag Ec 410, 411</td>
<td>2-3</td>
</tr>
<tr>
<td>Acctg 230, 231</td>
<td>6</td>
</tr>
<tr>
<td>Junior-level accounting or Cpt S 150 and 151, 152, 153, or 154</td>
<td>3</td>
</tr>
<tr>
<td>Econ 102, 203, 301, and 320 or 340</td>
<td>12</td>
</tr>
<tr>
<td>Engl 101 and 201, 302 or 401</td>
<td>6</td>
</tr>
<tr>
<td>Spe 102, 250, 302, 330 or 331</td>
<td>3</td>
</tr>
<tr>
<td>Communications proficiency elective</td>
<td>3</td>
</tr>
<tr>
<td>Hum and Soc S (one from Mgt 301, Psych 306, 307 and 3 hours of 200-level or above)*</td>
<td>12</td>
</tr>
<tr>
<td>Bio S and Ph S electives (include 1 hour credit for lab)**</td>
<td>7</td>
</tr>
<tr>
<td>Math 201 and 202</td>
<td>6</td>
</tr>
<tr>
<td>Ag elective, excluding Ag Ec</td>
<td>12</td>
</tr>
<tr>
<td>Total hours specified</td>
<td>99</td>
</tr>
<tr>
<td>Other electives</td>
<td>21</td>
</tr>
</tbody>
</table>

*May not include Econ, but must meet the 6 hours General University Requirement in Arts and Humanities.

**In addition to Math 201

General Curriculum

This option permits the student to obtain both breadth and depth in agricultural economics without a high degree of specialization in any one field. However, the program does have sufficient flexibility to permit the student to emphasize special interest areas such as policy, resource economics, development, or marketing. Although any one of the three curricula offered in the department will prepare the student for graduate work in agricultural economics, this program is especially well suited for that purpose.

Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Ec: 9 hours from 340, 350, 360, 440, 450, 460, six of which must be in the same sequence</td>
<td>6</td>
</tr>
<tr>
<td>410 or 411; 6 hours 300 or above electives; 6 hours 400-level electives</td>
<td>24</td>
</tr>
<tr>
<td>QMeth 215, Biom 310, 412</td>
<td>3-4</td>
</tr>
<tr>
<td>QMeth or Cpt S elective or Ag Ec 410, 411</td>
<td>2-3</td>
</tr>
<tr>
<td>Acctg 230</td>
<td>3</td>
</tr>
<tr>
<td>Econ 102, 203, 301, 320 or 340, 401 or 402</td>
<td>15</td>
</tr>
<tr>
<td>Ag Electives, excluding Ag Ec</td>
<td>12</td>
</tr>
<tr>
<td>Engl 101 and 201, 301, or 401</td>
<td>6</td>
</tr>
<tr>
<td>Spe 102, 250, 302, 330, or 331</td>
<td>3</td>
</tr>
<tr>
<td>Communications proficiency elective</td>
<td>3</td>
</tr>
<tr>
<td>Hum and Soc S (9 hours must be 200-level or above)*</td>
<td>15</td>
</tr>
<tr>
<td>Bio S and Ph S (include 1 hour credit for lab)**</td>
<td>7</td>
</tr>
<tr>
<td>Math 201 and 202</td>
<td>6</td>
</tr>
<tr>
<td>Total hours specified</td>
<td>99</td>
</tr>
<tr>
<td>Other electives</td>
<td>21</td>
</tr>
</tbody>
</table>

*May not include Econ, but must meet the 6
hours General University Requirements in Arts and Humanities.
**In addition to Math 201

Technical Curriculum
This option is designed for the student who wants to obtain a broad background, with emphasis on the application of economics to agriculture. Of the three curricula, this offers the greatest flexibility and, as a result, a wide variety of programs of study can be developed to meet the specific interest of the student.

Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Ec: 340, 350, 370</td>
<td>9</td>
</tr>
<tr>
<td>400-level electives</td>
<td>6</td>
</tr>
<tr>
<td>Electives</td>
<td>6</td>
</tr>
<tr>
<td>Statistics elective</td>
<td>3-4</td>
</tr>
<tr>
<td>Accrg 230; B Law 210 or Ag Ec 335</td>
<td>6</td>
</tr>
<tr>
<td>Econ 102, 203, 301, and 320 or 340</td>
<td>12</td>
</tr>
<tr>
<td>Ag electives, excluding Ag Ec (9 hours must be in one department)</td>
<td>18</td>
</tr>
<tr>
<td>Engl 101 and 201, 301, or 401</td>
<td>6</td>
</tr>
<tr>
<td>Spe 102, 250, 302, 330 or 331</td>
<td>3</td>
</tr>
<tr>
<td>Communication proficiency elective</td>
<td>3</td>
</tr>
<tr>
<td>Hum and Soc S (6 hours must be 200-level or above)</td>
<td>12</td>
</tr>
<tr>
<td>Bio S and Ph S (include 1 hour for lab credit)</td>
<td>7-10</td>
</tr>
<tr>
<td>Math 101, 107, 140, 171, 201, 202, 220</td>
<td>3</td>
</tr>
</tbody>
</table>

Total hours specified 94
Other electives 26

*May not include Econ, but must meet the 6 hours General University Requirement in Arts and Humanities.

**Students must meet the 10 hours General University Requirements in the Bio S and Ph S fields and may substitute appropriate math courses in this requirement.

Minor in Agricultural Economics
A minor is offered in agricultural economics which requires that a student complete 16 hours of course work in the department of which 12 hours must be in upper-division courses. Students must also complete one of the four junior-senior program sequences, e.g., farm management, marketing, agri-business management, or resources. Students wishing to declare a minor should consult with an adviser as early as possible to develop the required program.

Transfer Students
Students planning to transfer to Washington State University from other institutions should take courses which will meet the 100- and 200-level course requirements in economics, accounting, English, speech, and General University Requirements in the natural and social sciences. All students planning to major in agricultural economics are encouraged to take intermediate algebra prior to entering Washington State University.

Preparation for Graduate Study
Students who plan to do work in agricultural economics beyond the bachelor's degree should consult their advisers as early as possible to develop a study program directed toward their goals.

Department of Agricultural Engineering
Professor and Chair, L. G. King; Professors, L. L. Boyd, J. E. George, R. E. Hermanian, C. A. Pettitbone, A. E. Powell, H. Waeli; Associate Professors, D. L. Bassett, D. C. Davis, G. M. Hyde, L. G. James, D. K. McCool, K. E. Saxton, J. B. Simpson; Assistant Professors, R. G. Evans, W. B. Symons.

AGRICULTURAL ENGINEERING
Agricultural engineering is the application of engineering science to agriculture. Basic knowledge from almost all fields of engineering is utilized and the whole of agriculture is encompassed. Agricultural engineers may be involved in any of the many activities necessary for or in support of the production, processing, storage, transportation, and marketing of agricultural commodities. The technical divisions of agricultural engineering include: electric power and processing, food engineering, power and machinery, soil and water, and structures and environment. The demand is strong for agricultural engineering graduates in a variety of employment opportunities. Many graduates are employed as design or development engineers for private industries or governmental agencies. Others prepare for teaching and/or research careers, or seek self-employment in farming, consulting, or other agriculturally oriented enterprises.

The curriculum leading to the Bachelor of Science degree in Agricultural Engineering is accredited by the Accreditation Board for Engineering and Technology.

The student must apply to the department for certification of agricultural engineering as
a major. Deadlines for receipt of applications are November 15 for spring semester and
April 15 for summer and fall semester. Criteria for selection of certified majors include
g.p.a., normal progress, and number of repeats. Details are available in the departmental
office.

Description of Courses

For explanation see Index under "Symbols"

Ag E
110 Introduction to Agricultural Engineering 1 (0-3) For freshmen. Introduction to
design and agricultural engineering as a profession.
154 Creative Engineering 1 (0-3) Prereq Ag E 110. Engineering imagination,
origin, and development of design ideas, and conversion of ideas to mean-
ful reality.
354 Agricultural Engineering Analysis 3
(2-3) Prereq Cpt S 203; Math 315 or c/.
Analysis of physical and biological systems by digital computer methods.
361 Principles of Farm Machinery 3 (2-3)
Prereq C E 212. Operating principles, func-
tional components, and related motion
force, and power requirements.
380 (486) Farm Electrification Engineering
3 (2-3) Prereq E E 214 or c/.
Design and practice with electric power and
electronics in agriculture, motors, controls,
instrumentation.
385 Principles of Environmental Control 3
Prereq C E 315, M E 301 or c/.
Principles of heat and mass transfer applied
to agricultural structures; system
design; equipment selection.
390 Introduction to Soil and Water Engi-
neering 3 (2-3) Prereq C E 315; Soils
201. Fundamentals of soil and water
engineering including agricultural hy-
drology and hydraulics, erosion control,
and water quality.
451 Seminar 1 May be repeated for credit;
cumulative maximum 2 hours. Prereq
junior or senior. Readings and inter-
views, research, and oral presenta-
tion of professional subjects.
455 Agricultural Engineering Design I 1
(0-3) Prereq senior in Engr. Determina-
tion of background information for
design; selection and evaluation of de-
sign concepts.
456 (472) Agricultural Engineering Design
II 3 (1-6) Prereq Ag E 455. Continu-
ation of Ag E 455. Detailed design of an
agricultural engineering-related pro-
cess, machine, structure, or system.
462 (362) Internal Combustion Engines 3
(2-3) Prereq M E 301; C E 212. Theory
and design; effect of compression ratio,
fuel, weight transfer, traction, and hitching on tractor performance.
471 Farm Structures Design 3 Prereq C E
314. Engineering analysis and practice
applied to concrete foundations and
development of design in wood and steel for
farm buildings.
482 Microcomputer Controls in Agriculture
3 (2-3) Prereq Ag E 380. Microcomputer-based control systems with empha-
asis on agricultural applications. Credit
not granted for both Ag E 482 and 582.
487 Food Process Engineering 3 Prereq
Ag E 385 or F S 433 and Math 140.
Design of food processing systems; food
properties; thermal and physical
processes. Credit not granted for both
Ag E 487 and 587.
491 Irrigation Engineering 3 (2-3) Prereq
Ag E 390. Theory and design of gravity,
sprinkler, and trickle irrigation systems;
water requirements and sources; effi-
cient use of water and energy. Credit
not granted for both Ag E 491 and 591.
495 Internship in Agricultural Engineering
V 1-3 May be repeated for credit; cumu-
lative maximum 6 hours. Not open to
freshmen. Prior approval of supervisor
and adviser required. Work experience
related to academic learning.
496 Conservation Engineering 3 (2-3) Prereq
Ag E 390. Predicting occurrence and
disposition of water on agricultural
watersheds; erosion processes; water
and erosion control structures and meth-
ods; construction practices. Credit not
granted for both Ag E 496 and 596.
499 Special Problems V 1-4 May be repeated
for credit.
551 Advanced Agricultural Engineering
Topics 1-4 May be repeated for credit;
cumulative maximum 6 hours. Directed
group study of selected advanced topics
in agricultural engineering.
555 Natural Channel Flow 3 (2-3) Prereq
C E 451. Hydraulics of non-uniform
flow in irregular channels; unsteady
flow, flow routing, sediment transport
and density currents. Cooperative
course taught at the University of
Idaho.
Fluid Mechanics of Porous Materials 3
Prereq Math 273. Statics and dynamics of multi-flow systems in porous materials, properties of porous materials; steady and unsteady flow. Cooperative course taught at the University of Idaho.

Microcomputer Controls in Agriculture 3 (2-3) Graduate level counterpart of Ag E 482; additional requirements. Credit not granted for both Ag E 482 and 582.

Instrumentation and Measurements 3 (2-3) Prereq Math 172; Phys 102 or 202. Instrumentation systems and measurement concepts, electronic signal-conditioning components and circuitry, digital electronics and microprocessor basics.

Food Process Engineering 3 Graduate level counterpart of Ag E 487; additional requirements. Credit not granted for both Ag E 487 and 587.

Advanced Theory of Irrigation Water Requirement 3 Energy balance and consumptive use of water; influence of farm and project irrigation system design criteria, management, and efficiencies.

Irrigation Engineering 3 (2-3) Graduate level counterpart of Ag E 491; additional requirements. Credit not granted for both Ag E 491 and 591.

(591) Advanced Theory and Design of Irrigation Systems 3 (2-3) Prereq Ag E 491/591. Design and development of irrigation water application systems. (a/y)

Drainage Engineering 3 (2-3) Prereq Soils 201; C E 315 or Ag M 344. Engineering principles applied to surface and sub-surface drainage problems; investigation, design, materials, and construction of drainage systems.

Drainage Investigation and Design 3 (2-3) Prereq Ag E 593. Systematic study of drainage investigation, design, materials, construction, and inspection applied to agriculture. Continuation of Ag E 593.

Water Resources Seminar 1 May be repeated for credit; cumulative maximum 2 hours. Prereq senior or graduate standing. Oral presentations and discussions of leading research on water resources and water policies.

Conservation Engineering 3 (2-3) Graduate level counterpart of Ag E 496; additional requirements. Credit not granted for both Ag E 496 and 596.

Special Projects or Independent Study Variable credit.

Master's Research, Thesis, and/or Examination Variable credit.

Master's Special Problems, Directed Study and/or Examination Variable credit.

Doctoral Research, Dissertation, and/or Examination Variable credit. (For PhD in engineering science only.)

Schedule of Studies

The Bachelor of Science degree in Agricultural Engineering requires a total of 124 semester hours. At least 45 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Freshman Year

First Semester
- Ag E 110 Intro Ag E 1
- Engl 101 Composition 3
- M E 101 Graphic Design 2
- Math 171 Calculus I 4
- Chem 105 Prin of Chemistry 4

Second Semester
- Ag E 154 Creative Engr 1
- Arts and Hum Elective 3
- C E 101 Intro Survey 3
- Math 172 Calculus II 4
- Math 220 Linear Algebra 2
- Soc S Elective 3

Sophomore Year

First Semester
- Cpt S 203 Cpt Prag for Engrs 2
- C E 211 Statics 3
- Phys 201 Classical Physics 4
- Bio S 103 or Bio S Elective 4
- Econ 201 Contemp Econ 4

Second Semester
- Phys 202 Classical Physics 4
- Math 315 Diff Equations 3
- C E 212 Dynamics 3
- Ag E 354 Engr Analysis 3
- Arts & Hum Elective (GUR) 3

Junior Year

First Semester
- C E 314 Mech of Materials 3
- C E 315 Mech of Fluids 3
- M E 301 Fund of Thermodynamics 3
- Ag E 385 Prin of Env Control 3
- Soils 201 Soils 3
Second Semester
Ag E 361 Prin of Farm Mach
Ag E 390 Soil & Water Engr
EE 214 Design Analog & Dig
Ag E 471 Farm Struct Design
Ag E 451 Seminar

Senior Year
First Semester
Ag E 455 Ag Engr Design I
EE 463 Engr Admin
Math 273, 340, or Stat 420
Ag E Elective
Engr Elective
Communication Elect (GUR)

Second Semester
Ag E 456 Engr Design II
EE 304 or Arts & Hum (GUR)
Ag E Elective
Engr Design Elective
Engr or Sci Elective

Ag E electives must be selected from at least two of the following groups:
(a) Ag E 462
(b) Ag E 482/582
(c) Ag E 487/587
(d) Ag E 491/591, 593, or 496/596

Transfer Students
Students who plan to transfer to Agricultural Engineering at Washington State University from other institutions should coordinate their programs early with the Department Chair to select courses that will be applicable to degree requirements. A strong preparation in mathematics and physics, and proper selection of electives will minimize the time required to complete bachelor's degree requirements.

AGRICULTURAL MECHANIZATION
The Department of Agricultural Engineering prepares students in agricultural mechanization for the application of technology to operations or management in agriculture. The areas of application are: mechanized farming, services, management of agriculturally oriented businesses, sales, and promotional work in agricultural communities.

Emphasis is placed upon the practical application of technology to agricultural enterprises through engineering methods. This prepares the student to own, operate, and manage his own enterprise or provide services for private or governmental entities.

A wide variety of agricultural mechanization courses is available to non-majors in support of programs in other departments. Many courses can be used as electives by students who wish to explore the field or use the information for other personal reasons.

The curriculum leading to the Bachelor of Science degree in Agricultural Mechanization is approved by the American Society of Agricultural Engineers. The department also offers a minor in Agricultural Mechanization.

Description of Courses
For explanation see Index under "Symbols"

Ag M
110 Introduction to Agricultural Mechanization 1 (0-3) For freshmen. Basic skills for analyzing, solving, and presenting mechanization problems.
201 Metals Shop Practices 3 (1-6) Theory, applications, and practices of welding, machining, and associated skills in using metals.
203 Building Construction 3 (2-3) Principles and practices in farm building construction; foundations, frames, materials, tools, and plans; experience with tools and materials.
210 Agricultural Mechanics 3 Prereq Math 101. Theory of agricultural mechanics, including elements of basic physics, the energy concept, angles, and distance.
211 Agricultural Machinery 3 (2-3) Principles, materials of construction, care, capacity of tillage, planting, spraying, harvesting, and materials handling machinery.
312 Engines and Tractors 3 (2-3) Principles of engine operation, fuels, combustion, efficiency, power transmission, energy conversion, power measurement, tractor safety and costs.
313 Small Engine Repair 1 (0-3) Prereq Ag M 312 or c/f. The repair, adjustment, protective maintenance, operation, and safety of the small gasoline engine.
321 Agricultural Building Design 3 (2-3) Prereq Ag M 203. Building orientation and location, space requirements, and layout; structural requirements and design of foundations, frames, and connections.
331 Agricultural Electrification 3 (2-3) Basic electricity, wiring, and electrical applications in agricultural production.
344 Irrigation and Drainage 3 Prereq Math
101; Soils 201. Principles of irrigation and drainage, water measurement, irrigation methods and practices, selection of irrigation system components.

345 Irrigation Laboratory 1 (0-3) Prereq Ag M 344 or C/. Principles of soil moisture measurement techniques, water measurement, pumps and pump efficiencies, conveyance and distribution systems.

346 Turf Irrigation Systems 1 (0-3) Design, construction and operation of irrigation systems for turf and landscape plantings.

402 Methods, Materials, and Machines for Teaching Ag Mechanics 3 (1-6) Prereq Ag M 201, 203; 9 hrs Educ. Development of shop programs in project planning, demonstrations, and skills performance; safety and management of materials, tools, and machines.

403 Laboratory Projects Teaching Techniques 1 (1-3) May be repeated for credit; cumulative maximum 2 hours. Teaching techniques for laboratory projects in agricultural mechanics.

416 Mobile Hydraulics 3 (2-3) Prereq Ag M 312. Fluid power principles applied to the operation, selection, and maintenance of agricultural machinery.

426 Energy Concepts in Agricultural Structures 3 Prereq Ag M 203. Heat transfer, psychrometrics applied to temperature-moisture relationships in agricultural structures; renewable alternative energy sources. Credit not granted for both Ag M 426 and 526.

433 Agricultural Processing 3 Same as F S 433.

451 Seminar 1 Same as Ag E 451.

481 Advanced Agricultural Mechanization Topics V 1-4 May be repeated for credit; cumulative maximum 8 hours. By interview only.

490 Instructional Practicum V 1-4 May be repeated for credit; cumulative maximum 4 hours.

495 Internship in Agricultural Mechanization V 1-3 May be repeated for credit; cumulative maximum 6 hours. Not open to freshmen. Prior approval of supervisor and adviser required. Work experience related to academic learning.

499 Special Problems V 1-4 May be repeated for credit.

526 Energy Concepts in Agricultural Structures 3 Graduate level counterpart of Ag M 426; additional requirements.

Credit not granted for both Ag M 426 and 526.

Schedule of Studies

The Bachelor of Science degree in Agricultural Mechanization requires a total of 120 credit hours for graduation. Of these, at least 40 credit hours must be courses numbered 300 or above.

Freshman Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag M 201 Metals Shop</td>
<td>3</td>
</tr>
<tr>
<td>Ag M 110 Intro Ag M</td>
<td>1</td>
</tr>
<tr>
<td>Chem 101 Intro Chem</td>
<td>4</td>
</tr>
<tr>
<td>Engl 101 English Composition</td>
<td>3</td>
</tr>
<tr>
<td>Math 101 Intermediate Algebra</td>
<td>3</td>
</tr>
</tbody>
</table>

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag M 210 Ag Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>Chem 102 Chemistry Related to Man</td>
<td>4</td>
</tr>
<tr>
<td>Bio S 103 Intro Biology</td>
<td>4</td>
</tr>
<tr>
<td>Arts and Hum Elective</td>
<td>3</td>
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</table>

Sophomore Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag M 203 Ag Bldg Constr</td>
<td>3</td>
</tr>
<tr>
<td>Chem 240 or Phys 101</td>
<td>4</td>
</tr>
<tr>
<td>Bio S 104 or Bot 201</td>
<td>4</td>
</tr>
<tr>
<td>Ag Elective</td>
<td>3</td>
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</tbody>
</table>

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag M 211 Farm Machinery</td>
<td>3</td>
</tr>
<tr>
<td>Acctg 230 Principles of Acct</td>
<td>3</td>
</tr>
<tr>
<td>Com Prof Elective</td>
<td>3</td>
</tr>
<tr>
<td>Soc S Elective</td>
<td>3</td>
</tr>
<tr>
<td>Ag Ec 201 Econ Mgmt Ag</td>
<td>3</td>
</tr>
</tbody>
</table>

Junior Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag M 321 Ag Building Design</td>
<td>3</td>
</tr>
<tr>
<td>Ag Ec 340 Farm Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>Soils 201 Soils</td>
<td>3</td>
</tr>
<tr>
<td>Ag Elective</td>
<td>3</td>
</tr>
<tr>
<td>Arts and Hum Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag M 312 Engines and Tractors</td>
<td>3</td>
</tr>
<tr>
<td>Ag M 331 Ag Electrification</td>
<td>3</td>
</tr>
<tr>
<td>Ag M 451 Seminar</td>
<td>1</td>
</tr>
<tr>
<td>Cpt S 150, 153</td>
<td>4</td>
</tr>
<tr>
<td>Ag Ec 335 or B Law 210</td>
<td>3</td>
</tr>
<tr>
<td>Ag Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

Senior Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag M 344 Irrigation &amp; Drainage</td>
<td>3</td>
</tr>
<tr>
<td>Ag M 345 Irrigation Laboratory</td>
<td>1</td>
</tr>
</tbody>
</table>
Turf management opportunities include golf courses and playfields. Graduates are qualified for careers in agri-business, corporate and technical farm management, and research, sales, and service positions. Positions are available in government and commercial agencies such as Agricultural Research Centers, Agricultural Extension Services, State Departments of Agriculture, Agricultural Research Service, Natural Resources and the Soil Conservation Service as well as in food processing companies, insurance agencies, and commercial concerns dealing with farm products, fertilizers, and agricultural chemicals and seeds. Opportunities also exist for employment and further study in other countries. Teaching, research, and extension careers are available in community colleges and universities for graduates with advanced degrees.

The Department offers courses of study leading to the degree of Bachelor of Science in Agronomy, Bachelor of Science in Soils, Master of Science in Agronomy, Master of Science in Soils, and Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Agronomy

101 Introductory Field Crop Science 3 Production and adaptation of cultivated crops; principles affecting growth, development, management, and utilization.

201 Crop Growth and Development 3 (1-6) Prereq Bio S 103 or Agron 101 or c/. Principles and techniques related to growth, development, and culture of crop plants.

250 Crop Identification and Grading 1 (0-3) Identification and grading of agronomic crops.

301 Turfgrass Culture 3 (2-3) Principles of establishment and management of turf for lawns, parks, golf courses. Field trip required.


303 Grain Crops 3 Prereq Bot 201 or Bio S 104. Adaptation, production, and utilization of cereals and alternate crops. Field trip required.

304 (474) Cereal Products 2 Same as F S 304.

305 Principles of Weed Science 3 (2-3) In-
introduction to weed science; weed identification, biology, and control; herbicides and factors influencing their use.

405 Seed Processing 1 (0-3) Prereq Agron 250, 410. Principles and processes of separating seeds of different physical characteristics. Field trip required.

410 Seed Production and Technology 3 (2-3) Prereq Bio S 104 or Bot 201; Bot 320. Principles of seed production, physiology and quality evaluation. Field trip required.

411 Environmental Crop Physiology 3 Prereq Bot 320. Effects of environment and management on crop growth and development.

412 Seminar 1 May be repeated for credit. Current literature and reports on research or special topics.

445 (345) Plant Breeding 3 Prereq GenCB 301. Genetic principles applied to the improvement of plants. Field trip required.

469 Vegetable Seed Production 1 Survey of vegetable seed industry, production methods and quality evaluation. Joint course taught with the University of Idaho. (a/y)

496 Advanced Topics in Agronomy V 1-3 Prereq Bot 320 or Bio S 372.

499 Special Problems V 1-4 May be repeated for credit.

501 Agronomic Research Techniques 2 Prereq BC/BP 364. Biological and physical principles used in environmental crop physiology research. (a/y)

504 Advanced Plant Breeding 4 Prereq Agron 345. Genetic, cytotenic, and statistical theories and principles underlying modern methods. (a/y)

505 Improvement of Crop Quality 3 Prereq Agron 445, BC/BP 364 or Bot 320. Principles and methods of crop quality improvement by crop management, plant breeding and integrated approaches. (a/y)

507 Herbicide Development and Application 3 (2-3) Prereq Agron 305; Bot 320; Soils 201. Herbicide discovery, formulation, toxicity, and fate in soils; application equipment; professions in weed science. Joint listing with the University of Idaho. (a/y)

508 Seed Physiology 3 Prereq BC/BP 364. Physiology of seed development, physiology and biochemistry of germination; mechanisms of dormancy, inhibition and stimulation. (a/y)

509 Physiology in Plant Breeding 3 Prereq GenCB 301; Bot 320. Theory and methodology associated with the use of physiological and biochemical techniques in plant breeding programs. (a/y)

510 Seminar 1 May be repeated for credit. Literature review; preparation and presentation of reports in crop science.

512 Topics in Agronomy V 1-2 May be repeated for credit. Concepts of plant breeding, seed physiology, and technology; crop physiology and management.

518 Plant Stress Physiology 2 Prereq Bot 320 Responses of plants to temperatures, water, radiation, and other environmental stresses. Cooperative course taught at the University of Idaho. (a/y)

519 Physiology of Flowering 2 Prereq Bot 320. Vernalization photoperiodism and biochemistry of flowering processes; models. Cooperative course taught at the University of Idaho. (a/y)

538 Properties and Functions of Herbicides 2 Prereq Bot 320. Physical and chemical properties and mode of action of herbicides, their effects on plant structure, internal mechanisms, processes and sites of action. Cooperative course taught at the University of Idaho. (a/y)

569 Applied Seed Physiology 2 (1-3) Prereq Bot 320. Effect of environment on development aspects of important seed species, storage, longevity, dormancy, seed and seedling vigor and early events in germination. Cooperative course taught at the University of Idaho. (a/y)

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

General Departmental Requirements

At least 40 of the total hours required for this degree must be in upper-division courses.

CORE REQUIREMENTS

The core courses are common to all agronomy majors and include General University Requirements and supporting courses. The three
departmental undergraduate curricula offer flexibility in courses and selection of electives that best suit the individual student's needs and interests in consultation with the adviser.

**Hours**

Agron 201, 250, 305, 445, 411, 412, and 499(2)  16
Bot 320  3
GenCB 301  3
Soils 201  3
Pl P 329  3
Entom 340 or 343  3
Chem 105, 106, 107 (or 101, 102) and 240  12
Math Elective  3
Biom Elective  3
Com Prof Electives (inc Spe)  6
Bio S 103 and 104 or Bot 201  8
Hum Electives  6
Sec S Electives (inc Econ or Ag Ec 201)  6

Computer Science recommended

In addition to core courses students must select either the technical, business and industry, or science curriculum.

**TECHNICAL**

Emphasis is on basic principles and application techniques for production and management. The courses are concerned with the production of field crops processing and marketing agronomic products. Students in this curriculum must complete one of the listed options.

**Production and Management Option.** For the student who wishes to engage in farming or corporate farm management and field agronomy positions.

**Hours**

Agron Electives  10
Ag Ec 340  3
Soils 301, 401 and 402  6
Ag M 344  3

**Plant Protection Option.** For students who wish to study pest control and environmental quality (agricultural chemicals).

**Hours**

Agron Electives  5
Bact 101 or 201  4-5
Bio S 372, or Soils 407, or Hort 417  3-4
Pl P 405 or Entom 450 or IPM 452  2-3
Soils 301, 401 and 402  6
Ag M 344  3

**Turf Management Option.** For the student who wishes to specialize in golf course supervision and similar recreation positions involving agronomic management techniques and personnel relations.

**Hours**

Agron 301, 302, 499  8
L A 264  3
Ag M 346  1
Mgmr Elective  3
Pl P 405 or Entom 450 or Hort 417  3
Ag M 312 and 313  4
Ag M 344  3
Soils 301, 401 and 402  6

**Soils Option.** For students seeking training in soil and land management and plant/soil relationships.

**Hours**

Agron Electives  5
Geol 101 or 102  4
Soils 400 and 415 or 411 or 417  5-6
Soils 301, 401 and 402  6
Ag M 344  3

**BUSINESS AND INDUSTRY**

For students wishing to specialize in management with agri-business agencies.

For a minor in agricultural economics, see the Ag Ec adviser.

**Hours**

Agron Electives  5
Soils 301  2
Ag Ec 340, 350 or 370 and Elective  12
Accrg 230  3
Econ 320 or 301  3
B Law 210 or Ag Ec 335  3

**SCIENCE**

This curriculum prepares students for advanced studies as scientists in the areas of crop physiology, plant breeding, and environmental quality. Students may prepare for research careers with industry, as technicians and experimental aides, or for teaching and research positions in colleges, universities, and governmental agencies. Emphasis is given to basic principles and techniques related to plant morphology and metabolism. Students in this curriculum must complete:

**Hours**

Agron Electives  5
Chem 217 or 221  8
BC/BP 364, 366, or 563, 564  4-8
Math 171  3
Phys 101, 102  8
Bact 101 or 201  4-5
BC/BP 417, Bio S 305 or Bot 332  2-4
GenCB 302 or F S 371  2-4
Biom 412  3
Minor
A minor in agronomy may be obtained by students from other departments. See Agronomy adviser.

Transfer Students
Students planning to transfer to Washington State University should take courses which meet the agronomy core requirements.

Program in American Studies

Professor and Program Head, R. O. Johnson, English; Advisors: D. L. Ashby, History; J. R. Elwood, English; M. G. Land, English; D. H. Stratton, History.

At the MA and PhD levels, the interdisciplinary program in American Studies is offered jointly by the Department of History and English, with the assistance of the Department of Speech. The Bachelor of Arts degree in American Studies is offered by the participating departments listed below. The American Studies program is integrative: it investigates the literary historical, sociological, mythical, ethnic and intellectual backgrounds of the United States. It is a study of why, in the words of Henry James, it is a complex fate to be an American.

The bachelor’s degree program, in addition to preparing students for graduate work in the fields of American literature and history, as well as American Studies, offers excellent preparation for law school, and for the fields of mass communications and government service.

Degree Requirements

The program consists of a core of 39 hours, plus various 12-hour areas of concentration listed below. Courses in the core and areas of concentration may also be used to satisfy General University Requirements, where applicable.

Core Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Hist 110, 111 American History</td>
<td>6</td>
</tr>
<tr>
<td>Engl 245, 246 American Literature</td>
<td>6</td>
</tr>
<tr>
<td>Engl/Hist 316 Introduction to American Studies</td>
<td>3</td>
</tr>
<tr>
<td>Two upper-division courses in American history</td>
<td>6</td>
</tr>
</tbody>
</table>

Two upper-division courses in American literature 6
Two courses, taken in two different departments from: Phil 436, Pol S 300, 318, 427, 434, 453; Soc 331, 340, 342, 351; Spe 425 6
FA 304 or Mus 362 3
Engl 470, American Culture Series 3
Total 39

Areas of Concentration

One option not listed below is to be considered “open.” Superior students, with the approval of their advisers, may be permitted to investigate other areas by designing their own programs and taking courses that will aid in their research. Thus, certain students may wish to investigate the effects of, e.g., engineering, science, the graphic arts, theatre, cinema, or mass communications on American culture.

ANTHROPOLOGY AND NATIVE AMERICAN STUDIES

(1) Two courses (6 hours) from:
Anth 101, 350; Na Am 101, 201; Anth/Na Am 320, 331

(2) Two courses (6 hours) from:
Anth/Na Am 422, 451; Na Am/Anth 420; Anth 446

BLACK STUDIES
BI St 101, 310, 311
BI St 324 or 381

CHICANO STUDIES
Ch St 110 and 372
Two courses from:
Ch St 220, 248, 272, 313, 321, 383, 411

HISTORY
12 hours from:
Hist 210, 310, 311, 322, 325, 370, 411, 412, 413, 414, 416, 417, 418, 419, 420, 421, 422, 423, 429, 486, 487

LITERATURE
12 hours from:
Engl 319, 320, 368, 369, 470, 471, 472

POLITICAL SCIENCE
Pol S 101 and 434
One course from:
Pol S 300, 402, 404

One course from:
Pol S 318, 417, 427, 450, 455

SOCIOLOGY
12 hours from:
Soc 330, 331, 340, 342, 351 or 450, 361 or 362, 373, 384

83
Preparation for Graduate Study

Students interested in the Master of Arts degree program in American Studies should offer preparation approximating the undergraduate program described above, or bachelor's degree in English or History. Students with degrees in other humanities or social sciences areas may be accepted. Students interested in the PhD degree program must have the MA in English, History or American Studies. Every student should be well grounded in at least one modern European foreign language.

Department of Animal Sciences


The department offers courses of study leading to the degrees of Bachelor of Science in Animal Sciences, Master of Science in Animal Sciences, and Doctor of Philosophy. The department also participates in the graduate programs in Nutrition and Genetics and Cell Biology which offer Master of Science and Doctor of Philosophy degrees.

Bachelor's Program

The curriculum is designed to prepare students for positions in animal agriculture, for positions with industrial and commercial firms and government agencies related to animal agriculture and to prepare students for advanced study programs involving research, teaching or veterinary medicine.

Core courses are required for majors in the department. Prior to their junior year students select one of eleven options to further their interest. These options specify courses in addition to the core courses.

Six production options including general livestock, beef cattle and sheep, dairy cattle, horses, swine and poultry permit specialization in animal commodity areas. These options emphasize commercial animal agriculture operations for students intending to work in farm production or in related industries. Employment opportunities relate to herds and flocks, feedlots, general management including self-employment, and to sales promotion for livestock and poultry operations. Further opportunities are with financial organizations, animal product processors and sales, feed suppliers, artificial insemination organizations and miscellaneous field representatives serving animal agriculture.

Meats is an option available to students interested in carcass animal evaluation and product processing. Graduates also enter federal employment.

Animal biology, animal breeding, animal nutrition and animal physiology are individual options dealing with disciplines applicable across animal commodity groups. Employment opportunities are found with laboratories, pharmaceutical companies, reproduction service agencies and with feed companies. In addition, the animal biology option prepares students for entrance into the College of Veterinary Medicine. Each of the four options is also used in preparation for graduate studies for further specialization in the disciplines.

Description of Courses

For explanation see Index under "Symbols"

A S

101 Farm Animals That Serve Mankind 3
Genetic, physiological, and nutritional principles of animal production, importance of farm animals in the food supply of modern society. Field trip required.

168 Basic Equitation 1 Basic horsemanship and riding principles for students with no riding experience.

172 (284) Dairy Cattle Management Laboratory 1 (0-3) May be repeated for credit; cumulative maximum 2 hours. Management practices associated with a dairy enterprise.

174 (280) Beef Cow-Calf Management Laboratory 1 (0-3) May be repeated for credit; cumulative maximum 2 hours. Management practices associated with a beef cow-calf enterprise for students without experience.
176 (282) Sheep Management Laboratory 1 (0-3) Management practices associated with a farm flock sheep enterprise.

178 (283) Swine Management Laboratory 1 (0-3) Management practices associated with a swine enterprise.

213 Applied Animal Nutrition 3 Prereq one sem Chem; one sem Bio S. Not open to A S majors. Characteristics of nutrients, nutritional requirements, ration calculations and feeding practices for farm animals. Credit not granted for both A S 213 and 313.

260 (250) Live Animal and Carcass Evaluation 3 (1-6) Basic principles of live animal and carcass evaluation.

264 (204) General Poultry Science 3 (2-3) Breeds, breeding, physiology, incubation, brooding, nutrition, products technology, housing, equipment, and management.

266 (288) Horses and Horsemanship 3 (2-3) Not open to first-year freshmen. History and evolution; anatomy and physiology; principles of selection; care and basic training of horses.

268 Intermediate Equitation 1 Horsemanship and riding principles for students with riding experience.

269 English Equitation 1 Prereq A S 268. Intermediate principles of forward seat riding.

270 Western Equitation 1 Prereq A S 268. Intermediate principles of stockseat riding.

272 (212) Dairy Cattle Traits 2 (1-3) Evaluating form and function in dairy cattle; measurement of production and evaluation of type.

301 Principles of Nutrition 3 Prereq Bio S 102 or 104; Chem 102; Chem 240 or c/. Digestion, absorption, metabolism, and function of nutrients.

313 Feeds and Feeding 3 (2-3) Prereq A S 301. Practices, requirements, nutritive characteristics and calculations of rations for animals. Credit not granted for both A S 213 and 313.

330 (364) Genetics of Farm Animals 3 (2-3) Prereq GenCB 301. Genetic principles applied to breeding of farm animals.

350 (366) Reproduction of Farm Animals 3 Anatomy and physiology of reproductive organs; hormones of reproduction; production of gametes; artificial insemination; fertilization; prenatal development; fertility and infertility.

351 (368) Reproduction of Farm Animals Laboratory 1 (0-3) Prereq A S 350 or c/. Laboratory and field techniques used in animal reproduction involving hormones, artificial insemination, semen evaluation and pregnancy.

360 (315) Meat Science 3 (2-3) Anatomy, slaughter, classification, and processing of red meat animal species.

378 (397) Advanced Livestock and Meat Selection and Evaluation 2 (0-6) May be repeated for credit. Prereq A S 272 or 260. Principles and practices of livestock and meat selection and evaluation.

380 (325) Seminar 1 May be repeated for credit. For juniors.

398 Special Topics in Animal Sciences V 1-5 Current topics in animal sciences.

399 Practicum V 1-8 Directed experience in livestock production and related fields.

404 Non-Ruminant Nutrition 3 (2-3) Prereq A S 313. Physiology of digestion, nutrient requirements, and metabolism deficiency signs; ration formulations and mixing.

410 Ruminant Nutrition 3 Prereq A S 313. Anatomy, physiology, and metabolism in ruminant nutrition.

415 Animal Nutrition Laboratory 1 (0-3) Prereq A S 301. Quality control, proximate analysis, and other laboratory methods related to nutritional experiments with animals.

428 Topics in Animal Breeding 2 May be repeated for credit; cumulative maximum 4 hours. Prereq A S 330. Systems of selection and mating for genetic improvement in farm animals. Credit not granted for both A S 428 and 528.

440 (403) Physiology of Domestic Animals 3 Prereq A S 350. Basic animal functions; relationship and difference between domestic animals; measurement of functional processes.

441 (405) Physiology of Domestic Animals Laboratory 1 (0-3) Prereq A S 440 or c/. Measurement of functional processes in domestic animals.

444 (423) Environment Aspects of Animal Management 3 (2-3) Prereq A S 301; A S 440 or Zool 251. Relations of the thermal, social, and disease environments to animal function and performance. (a/y)

452 (413) Physiology of Lactation 3 Prereq A S 350. Anatomy, physiology, and endocrine control of mammary gland development and milk secretory process.
<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Description</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>454</td>
<td>Artificial Insemination and Pregnancy Detection 2</td>
<td>Prereq A S 351</td>
<td>Techniques in semen handling, insemination and pregnancy detection in cattle.</td>
<td>2</td>
</tr>
<tr>
<td>464</td>
<td>Commercial Poultry Operation 2</td>
<td>Prereq A S 313</td>
<td>Field observations of poultry farm operations, feed manufacturing, hatchery operations, marketing agencies, and poultry processing.</td>
<td>3</td>
</tr>
<tr>
<td>466</td>
<td>Horse Production 3</td>
<td>Prereq A S 313</td>
<td>Principles of breeding, feeding, and management of horses.</td>
<td>2</td>
</tr>
<tr>
<td>472</td>
<td>Dairy Cattle Production 3</td>
<td>Prereq A S 313</td>
<td>Principles of breeding, feeding, and management of dairy cattle.</td>
<td>2</td>
</tr>
<tr>
<td>474</td>
<td>Beef Cattle Production 3</td>
<td>Prereq A S 313</td>
<td>Principles of breeding, feeding, management, and marketing of purebreds and commercial beef cattle.</td>
<td>3</td>
</tr>
<tr>
<td>476</td>
<td>Sheep Science 3</td>
<td>Prereq A S 313</td>
<td>Breeding, feeding, management, and marketing of commercial and purebred sheep; wool studies. Cooperative course taught at the University of Idaho.</td>
<td>3</td>
</tr>
<tr>
<td>499</td>
<td>Special Problems V 1-4</td>
<td></td>
<td>May be repeated for credit.</td>
<td>1-4</td>
</tr>
<tr>
<td>500</td>
<td>Seminar in Nutrition 1</td>
<td></td>
<td>May be repeated for credit.</td>
<td>2</td>
</tr>
<tr>
<td>505</td>
<td>Experimental Nutrition 3</td>
<td>Prereq Chem 217</td>
<td>Laboratory techniques used in nutritional research; modern biochemical methods of analysis; introduction to physiological chemistry.</td>
<td>3</td>
</tr>
<tr>
<td>510</td>
<td>Rumen Microbiology 3</td>
<td>Prereq A S 410</td>
<td>3 hrs microbiology. Identify and characterize bacterial and protozoa and their metabolism in the rumen of domestic and wild herbivores.</td>
<td>3</td>
</tr>
<tr>
<td>512</td>
<td>Vitamins 2</td>
<td>Prereq A S 404</td>
<td>Role of vitamins in the nutrition of animals; emphasis on fat soluble vitamins.</td>
<td>3</td>
</tr>
<tr>
<td>514</td>
<td>Energy Metabolism 3</td>
<td>Prereq A S 404</td>
<td>Biochemical, physiological, and nutritional aspects of energy metabolism.</td>
<td>3</td>
</tr>
<tr>
<td>516</td>
<td>Protein and Amino Acid Metabolism 2</td>
<td>Prereq A S 404</td>
<td>Biochemical physiological and nutritional aspects of protein and amino acid metabolism.</td>
<td>4</td>
</tr>
<tr>
<td>518</td>
<td>Mineral Metabolism 3</td>
<td>Prereq A S 404</td>
<td>Dietary levels, absorption, excretion, metabolism, and interactions of minerals.</td>
<td>3</td>
</tr>
<tr>
<td>528</td>
<td>Topics in Animal Breeding 2</td>
<td></td>
<td>Graduate level counterpart of A S 428; additional requirements. Credit not granted for both A S 428 and 528.</td>
<td>2</td>
</tr>
<tr>
<td>530</td>
<td>Analysis and Interpretation of Animal Experiments 2</td>
<td>Prereq A S 330</td>
<td>Analysis and interpretation of animal experiments and the use of computers in processing data; discussion of student's research problems.</td>
<td>3</td>
</tr>
<tr>
<td>540</td>
<td>Seminar in Animal Physiology 1</td>
<td></td>
<td>Joint course taught with the University of Idaho.</td>
<td>2</td>
</tr>
<tr>
<td>548</td>
<td>Endocrine Physiology 3</td>
<td>Prereq BC/BP 364</td>
<td>Physiology and chemistry of endocrine systems and mechanisms of action of hormones on organs and cellular processes in mammals.</td>
<td>2</td>
</tr>
<tr>
<td>549</td>
<td>Endocrine Physiology Laboratory 1</td>
<td>A S 548 or c/.</td>
<td>Modern techniques in endocrinology; immunoassays, receptor assays; hormone measurement and hormone effects in animals.</td>
<td>2</td>
</tr>
<tr>
<td>550</td>
<td>Advanced Reproduction 4</td>
<td>Prereq A S 350</td>
<td>Physiology of sexual maturation; gametogenesis; sexual cycle; fertilization; embryonic development; physiological, chemical, and immunological characterization of hormones of reproduction.</td>
<td>3</td>
</tr>
<tr>
<td>598</td>
<td>Advanced Topics in Animal Sciences V 1-2</td>
<td></td>
<td>May be repeated for credit. Recent research in various disciplines of animal sciences.</td>
<td>1-2</td>
</tr>
<tr>
<td>600</td>
<td>Special Projects or Independent Study Variable credit.</td>
<td></td>
<td>Master's Research, Thesis, and/or Examination Variable credit.</td>
<td>1-2</td>
</tr>
<tr>
<td>800</td>
<td>Doctoral Research, Dissertation, and/or Examination Variable credit.</td>
<td></td>
<td>Doctoral Research, Dissertation, and/or Examination Variable credit.</td>
<td>1-2</td>
</tr>
</tbody>
</table>

**Schedule of Studies**

At least 40 of the total hours required for the
bachelor's degree in this program must be in upper-division courses.

Core Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts and Hum Elective</td>
<td>6</td>
</tr>
<tr>
<td>Ag Ec 201 or Econ 203</td>
<td>3</td>
</tr>
<tr>
<td>Soc S Elective</td>
<td>3</td>
</tr>
<tr>
<td>Engl 101 and 201</td>
<td>6</td>
</tr>
<tr>
<td>Ag 205 or Spe 102</td>
<td>3</td>
</tr>
<tr>
<td>Math 107 or 201</td>
<td>3</td>
</tr>
<tr>
<td>Bio S 103 and 104</td>
<td>8</td>
</tr>
<tr>
<td>Chem 101 and 102 or 105 and 106</td>
<td>8</td>
</tr>
<tr>
<td>Chem 240</td>
<td>4</td>
</tr>
<tr>
<td>Biom 310 or 412</td>
<td>3</td>
</tr>
<tr>
<td>GenCB 301</td>
<td>3</td>
</tr>
<tr>
<td>V An 308</td>
<td>3</td>
</tr>
<tr>
<td>A S 440 and 441 or Zool 251</td>
<td>4</td>
</tr>
<tr>
<td>A S 301, 313, 330, 350, 351, and 380</td>
<td>14</td>
</tr>
</tbody>
</table>

One of the following options must be chosen. The courses listed for that option are required in addition to the above core.

General livestock: A S 260, 360; three of A S 464, 466, 472, 474, 476, 478; Ag Ec 210, 340; Ag Ec 335 or B Law 210; Ag Ec 430 or Acctg 230; Agron 302.

Beef cattle and sheep: A S 260, 360, 410, 454; A S 174, 474 or A S 176, 476, Ag Ec 210, 340; Ag Ec 335 or B Law 210; Ag Ec 430 or Acctg 230; Agron 302 or FRM 352; VMS 261.

Dairy cattle: A S 172, 272, 410, 452, 454, 472; Ag Ec 210, 340; Ag Ec 335 or B Law 210; Ag Ec 430 or Acctg 230; Agron 302; F S 305; VMS 261.

Horses: A S 260, 266, 404, 466; Ag Ec 210, 340; Ag Ec 335 or B Law 210; Ag Ec 430 or Acctg 230; Agron 302; Ag M 203; VMS 261.

Swine: A S 178, 260, 360, 404, 478; Ag Ec 210, 340; Ag Ec 335 or B Law 210; Ag Ec 430 or Acctg 230; Agron 302; VMS 261.

Poultry: A S 264, 404, 464; one of A S 260, 360, F S 102 or 305; Ag Ec 210, 340; Ag Ec 335 or B Law 210; Ag Ec 430 or Acctg 230; VMS 261.

Meats: A S 260, 360, 378; one of A S 464, 466, 472, 474, 476 or 478; Ag Ec 210; Bact 101 or 201; F S 370; VMS 261.

Animal breeding: A S 428, 499; one of A S 464, 466, 472, 474, 476 or 478; one of A S 260, 360, F S 102 or 305; BC/BP 364; Math 140, 141 in lieu of Math 107 or 201; Cpt S 210; Biom 412; Ag Ec 411; GenCB 302.

Animal biology: One of A S 464, 466, 472, 474, 476 or 478; one of A S 260, 360, F S 102 or F S 305; an additional 3 hrs of A S 172, 174, 176, 178, 264, 266, 464, 466, 472, 474, 476 or 478; Ag Ec 335 or 430; B Law 210 or Acctg 230; Bact 201; BC/BP 364; Phys 101, 102.

Nutrition: A S 404, 410; one of A S 464, 466, 472, 474, 476 or 478; one of A S 260, 360, F S 102 or 305; Chem 105, 106 and 217; Chem 340, 341, 342 in lieu of Chem 240; Math 140, 141 in lieu of Math 107 or 201; Phys 101, 102.

Animal physiology: A S 444 or 452; one of A S 464, 466, 472, 474, 476 or 478; one of A S 260, 360, F S 102 or 305; BC/BP 364; Chem 217; two of Zool 315, 320, 352, 353, 473, 474 or Bact 201, 310, 412; Phys 101, 102; Math 202.

Minor in Animal Sciences

A minor requires a minimum of 16 semester hours, half of which must be in upper-division work. Students wishing to declare a minor should consult the department as early as possible to develop an approved schedule of courses.

Transfer Students

Students planning to transfer to the Department of Animal Sciences, Washington State University, from community colleges or other institutions should complete as many of the required courses in chemistry, biological sciences, physics, and mathematics as possible.

Department of Anthropology

Associate Professor and Department Head, G. L. Gamble; Professors, R. E. Ackerman, J. H. Bodley, W. D. Lipe, R. A. Littlewood, P. J. Mehriinger, J. Sheppard, W. Willard; Professor Emeritus, R. D. Daugherty; Associate Professors, C. E. Gustafson, F. A. Hassan, G. S. Krantzi, D. A. Messerschmidt; Assistant Professors, M. S. Fleisher, T. A. Konler, W. Millsap.

The courses in anthropology are designed to familiarize the student with human evolution, the prehistoric development of culture, linguistics, and the role of cultural systems in contemporary Western and non-Western societies. The major in anthropology receives training in anthropological theory, archaeology, human development, human society and
culture, linguistics and linguistic anthropology. Positions open to anthropologists include those in teaching, research, museum work, state and federal agencies, and private consulting firms. In addition, anthropology provides a strong option for a liberal arts education.

Courses within archaeology are designed to broaden opportunities for students interested in interdisciplinary problems relating to human prehistory by integrating traditional course work with courses in Quaternary geomorphology, chronology, and paleoecology. Courses are taught by staff members with specialties in geology, paleontology, and vertebrate paleontology. Additional work in related fields is encouraged at WSU and through exchange courses with the University of Idaho. The interdisciplinary emphasis is enhanced by the diverse environmental settings of the state and emphasis on field work.

The extensive anthropological collections in the library include the Human Relations Area Files and the Peabody Museum Catalog of anthropological publications. The collections of the Laboratory of Anthropology are also available for study. The department maintains a small museum which contains displays on human evolution, archaeology, and the material cultures of non-Western peoples. This museum is open to the public and special tours can be arranged.

The department offers a course of study leading to the degrees of Bachelor of Arts, Master of Arts, and Doctor of Philosophy in Anthropology.

Description of Courses

For explanation see Index under "Symbols" Anth


198 [S] Anthropology Honors 3

201 [H] Art and Society 3 Art as an expression of social and cultural systems in preliterate societies.

203 [S] Peoples of the World 3 Principles of cultural anthropology through study of various ethnic groups from different parts of the world.

230 [S] Introduction to Archaeology 3 (2-3) Development of a dynamic picture of past human behavior from archaeological evidence.

250 Introduction to Linguistics 3 Introduction to the scientific study of language.

256 The Organization of English 3 Same as Engl 256.

260 [B] Introduction to Physical Anthropology 3 Evidences for human evolution; processes of racial diversification; techniques of physical anthropology.

300 Field Methods V 6-8 Prereq permission by application. Practice in methods of archaeological, ethnological, or linguistic field research.

301 [S] Culture and Personality 3 Prereq Anth 101 or Soc 101. The individual as the product and carrier of culture; personality development in selected world societies; anthropological concept of personality types.

303 [S] Religion in Culture 3 Prereq Anth 101 or 203. Preliterate and modern religious concepts, practices, and practitioners; origin and function of religion.

304 [H] Anthropology and World Problems 3 Prereq Anth 101 or 203. Data and techniques of physical and cultural anthropology applied to the solution of social and political problems.

309 [S] Cultural Ecology 3 Prereq 3 hrs Anth. Major findings of ecological anthropology relating to problems of population, resources, and environment in primitive cultures.

320 [S] Native Peoples of North America 3 Culture areas of North America; comparison of representative aboriginal cultures.

329 (429) Peoples of Asia 3 May be repeated for credit; cumulative maximum 6 hours. Traditional and/or contemporary cultures of South, Southwest, Southeast, East, and Central Asia.

330 [S] Origins of Culture and Civilization 3 Prereq 3 hrs Anth. Archaeological traces of people in the Old World from the emergence of thought and culture to the first great civilizations.

331 [S] America Before Columbus 3 Prereq 3 hrs Anth. Cultures and environments of North/Middle America from the arrival of the earliest hunter-gatherers to the complex Mayan and Aztec civilizations.

336 [H] Classical Archaeology 3 Classical Mediterranean civilizations: effects on Western art, architecture, social processes.

350 [S] Speech, Thought and Culture 3 The role of language in social situations and as a reflection of cultural differences.
351 Crime and Punishment in Primitive Society 3 Prereq Anth 101. Crime and punishment in nonwestern, nonliterate societies. (a/y)

355 [H] Language in History 3 Writing systems, language in reconstruction of culture history, language families, evolution, and paralles.

401 History of Anthropological Theory 3 Prereq 6 hrs Anth. Development of theories in cultural anthropology; contributions of specific individuals; representative classics. Credit not granted for both Anth 401 and 501.

402 Introduction to Kinship Studies 3 Prereq Anth 101; Soc 101; Psych 350. The sociology of kinship and social organization; social forms and processes in a comparative perspective. Credit not granted for both Anth 402 and 502.

403 Economic Anthropology 3 Prereq Anth 101; Soc 101; Econ 101. Introduction to economic organization and processes in comparative perspective; tribal (primitive) and peasant economies. Credit not granted for both Anth 403 and 503. (a/y)

405 Anthropology and Education 3 Anthropological perspectives on enculturation bicultural/bilingual education; anthropology and public. Credit not granted for both Anth 405 and 505.

420 Native American Perspectives on the Ecology 3 Same as Na Am 420.

422 Native Peoples of the Pacific Northwest 3 Prereq Anth 101. Aboriginal cultures of the Northwest Coast and Plateau regions of North America. Credit not granted for both Anth 422 and 522.

424 Peoples of the Pacific 3 Prereq Anth 101 or 203. Culture areas of the Pacific; the major cultural types of Polynesia, Micronesia, Melanesia, and New Guinea. Credit not granted for both Anth 424 and 524.

426 Native Peoples of Middle and South America 3 Prereq Anth 101, 203. Culture history, culture areas and typologies; the impact of Europeans; theoretical problems and current research. Credit not granted for both Anth 426 and 526.

430 Introduction to Archaeological Method and Theory 3 Prereq Anth 230 and 330 or 331. Archaeological theory in anthropological perspective; current trends in method and theory in American ar-

435 Cultural Resource Management 3 Role of archaeology in preserving the nation's cultural heritage; environmental impact statements, antiquity laws, public involvement; the archaeologist as a cultural resource manager. Credit not granted for both Anth 435 and 535.

436 Ethnoarchaeology 3 Multidisciplinary approach (archaeology, ethnography and history) to the interpretation of man's past cultures. Credit not granted for both Anth 436 and 536.


450 Descriptive Linguistics 3 Introduction to analysis and description of natural languages; phonological, syntactic, and semantic analysis of data from a variety of languages. Credit not granted for both Anth 450 and 550.

456 Historical Linguistics 3 Prereq Anth 450. Historical study of language, sound change, grammatical change, semantic change. Credit not granted for both Anth 456 and 556.

462 Human Issues in International Development 3 Prereq senior or graduate student. Interdisciplinary analysis of complex interaction between tradition and modernity in Third World society, and its attendant human predicament.


465 Evolution of Man 3 Prereq Anth 260. Human origins in the light of the fossil record and evolutionary theory. Credit not granted for both Anth 465 and 565.

466 Human Osteology 3 (2-3) Prereq Anth 260. Observations and measurements of human skeleton; variations based on age, sex, and race; comparisons with fossil man and higher primates. Credit not granted for both Anth 466 and 566.

471 Man's Past Environments 4 (3-3) Quaternary problems and interpretation of Quaternary environments involving integration of geological, archaeological,
botanical, and zoological data.

500 Field School 4 (1-9) Training in gathering and analyzing field data.

501 History of Anthropological Theory 3 Graduate level counterpart of Anth 401; additional requirements. Credit not granted for both Anth 401 and 501.

502 Introduction to Kinship Studies 3 Graduate level counterpart of Anth 402; additional requirements. Credit not granted for both Anth 402 and 502.

503 Economic Anthropology 3 Graduate level counterpart of Anth 403; additional requirements. Credit not granted for both Anth 403 and 503.

504 Culture Change and Modernization 3 Culture change through the processes of innovation, diffusion, and acculturation.

505 Anthropology and Education 3 Graduate level counterpart of Anth 405; additional requirements. Credit not granted for both Anth 405 and 505.

506 Seminar in Primitive Art 3 By interview only. Art as an expression of social and cultural systems in nonliterate societies; art is examined as affective behavior. (a/y)

507 Advanced Studies in Culture Theory 3 May be repeated for credit; cumulative maximum 6 hours. Prereq 6 hrs Soc S. Evaluation of major theories and methods and their relationship to problems in cultural-social analysis.

509 Ecological Anthropology 3 Ecological principles applied to problems involving human populations.

510 Seminar in the Synthesis of Cultural Anthropology 3 Major developments and issues in cultural and social anthropology.

512 Primitive Stoneworking 3 Aboriginal stoneworking methods and their application to archaeology.

513 Applied Anthropology 3 By interview only. History and contemporary directions of applied anthropology; theory and method; international and community development issues; case study.

515 Theory and Method in Ethnohistory 3 Ethnohistorical research: theoretical assumptions and methodologies; evaluating primary and archival materials; ethnographic inference.

517 Seminar in Symbolic Systems and Behavior 3 Prereq Anth 101. Symbolic systems as structures and processes.

and cognition; perception and exploitation of natural world; symbolic, linguistic and psychological anthropology.

520 Area Seminars 3 May be repeated for credit. Ethnology of areas such as Southeast Asia, Africa, or specific countries such as Canada, China, Indonesia.

522 Native Peoples of the Pacific Northwest 3 Graduate level counterpart of Anth 422; additional requirements. Credit not granted for both Anth 422 and 522.

524 Peoples of the Pacific 3 Graduate level counterpart of Anth 424; additional requirements. Credit not granted for both Anth 424 and 524.

526 Native Peoples of Middle and South America 3 Graduate level counterpart of Anth 426; additional requirements. Credit not granted for both Anth 426 and 526.

530 Introduction to Archaeological Method and Theory 3 Graduate level counterpart of Anth 430; additional requirements. Credit not granted for both Anth 430 and 530.

532 Pro-Seminar in North American Archaeology 3 May be repeated for credit. Integration of field data with problem approaches in archaeology, generation of theoretical constructs; development of new orientations.

535 Cultural Resource Management 3 Graduate level counterpart of Anth 435; additional requirements. Credit not granted for both Anth 435 and 535.

536 Ethnoarchaeology 3 Graduate level counterpart of Anth 456; additional requirements. Credit not granted for both Anth 456 and 536.

537 Quantitative Methods in Archaeology 3 May be repeated for credit; cumulative maximum 6 hours. Prereq undergraduate Stat course. Exploratory data analysis, inferential statistics, locational analysis, interactive terminal use and batch statistical processing applied to archaeological problems.

538 Prehistory of Selected Areas V 1-3 May be repeated for credit; cumulative maximum 9 hours.

540 Prehistory of Northwest Coast 3 Archaeology of Northwest Coast.

542 Prehistory of Alaska and Eastern Siberia 3 Prehistoric cultural developments in the Arctic and sub-Arctic zones of Asia and North America.

543 Plateau Prehistory 3 Archaeology of the
Historical Archaeology 3 Excavations and analysis of historical archaeological sites; acculturational implications. Cooperative course taught at the University of Idaho.

Lithic Technology 3 Prereq Anth 412. Basic concepts involved in the interpretation of lithic artifacts via replicative systems analysis.

Descriptive Linguistics 3 Graduate level counterpart of Anth 450; additional requirements. Credit not granted for both Anth 450 and 550.

Seminar in Phonology 3 Prereq Anth 450. Current theories and methods in the analysis of the phonological component of natural language. (a/y)

Seminar in Syntax 3 Prereq Anth 450. Current theories and methods in the analysis of the syntactic component of natural language. (a/y)

Sociocultural Linguistics 3 The role of language in culture, cognition and society. (a/y)

Seminar in Anthropological Methods 3 Prereq Anth 450, 510. Elicitation, recording techniques and analysis of sociocultural, and linguistic field data; field work and seminar orientation.

Historical Linguistics 3 Graduate level counterpart of Anth 456; additional requirements. Credit not granted for both Anth 456 and 556.

Seminar in Language Structure 3 May be repeated for credit; cumulative maximum 9 hours. Linguistic study of structures of selected languages or language groups.

Seminar in Linguistics 3 May be repeated for credit. History of theory of linguistics; sociolinguistics; linguistics and reconstruction of culture history; mathematics and computer linguistics.


Human Races 3 Graduate level counterpart of Anth 463; additional requirements. Credit not granted for both Anth 463 and 563.

Evolution of Man 3 Graduate level counterpart of Anth 465; additional requirements. Credit not granted for both Anth 465 and 565.

Human Osteology 3 (2-3) Graduate level counterpart of Anth 466; additional requirements. Credit not granted for both Anth 466 and 566.

Seminar in Physical Anthropology 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Anth 260. Investigations of selected areas of research in modern physical anthropology.

Sediments and Quaternary Environments 4 (3-3) Sediment-forming processes, sedimentological techniques, reconstruction of quaternary environments, and paleoecological analysis of archaeological sediments. Field trip required.

Archaeological and Quaternary Stratigraphy 4 (3-3) Prereq Anth 570. Stratigraphic classification, field procedures, presentation of data, stratigraphy and quaternary environments; the quaternary record, and case studies of archaeological sites. Field trip required.

Identification of Faunal Remains 4 (2-6) Prereq Anth 471; Soils 404. The relevance of faunal remains in archaeological context; excavating, preserving, and identifying bones commonly encountered in archaeological sites. Field trip required.

Introduction to Quaternary Vertebrates 4 (3-3) Prereq Anth 471. Ecological and paleoecological techniques as tools for enhancing interpretation of problems in prehistory, importance of faunal changes through time. Field trip required.

Palynology 4 (3-3) Pollen and spore morphology, evolution, production, dispersal, and preservation; index fossils, dating, archaeology, and vegetational history. Field trip required.

Quaternary Vegetation and Climate 4 (2-6) Prereq Anth 576. Reconstruction of Quaternary environments and climatic change through studies of fossil pollen, plant macrofossil assemblages, tree rings. Field trip required.

Paleoecology 3 Past environments, stressing the interrelations of physical and biological factors. Cooperative course taught at the University of Idaho.

Special Topics in Anthropology 3 May be repeated for credit; cumulative maximum 9 hours. Examination of current areas of anthropological theory and research.
592 Special Topics in Anthropology 3 May be repeated for credit; cumulative maximum 9 hours. Examination of current areas of anthropological theory and research.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

**Schedule of Studies**

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses. A student majoring in this curriculum is required to take a minimum of 30 hours in anthropology. A student minoring in anthropology is required to take a minimum of 16 hours in anthropology, half of which are to be in upper-division courses.

The anthropology major must achieve a grade of C- or better in two courses from each of the following series:

(a) Anth 203, 320, 422, 424, 426, 429;
(b) Anth 260, 463, 465, 466;
(c) Anth 230, 330, 331, 336, 430, 435, 436, 446, 456;
(d) Anth 250, 350, 355, 450, 456;
(e) Anth 101 or 198, 201, 301, 303, 304, 309, 401, 402, 403, 446.

 Majors in anthropology are advised to take advanced work in two supporting fields.

**Preparation for Graduate Study**

As preparation for work toward an advanced degree a student should have completed not less than 18 hours in anthropology.

**Department of Architecture**


The Department of Architecture offers courses of study in three fields—architecture, construction management, and architectural studies. The degrees offered are Bachelor of Architecture, Bachelor of Science in Construction Management, and Bachelor of Science in Architectural Studies.

Architects are trained to perform professionally in a wide range of design and construction related areas and assume important roles in the creation of a better built environment. They may work as independent practitioners, for large corporate firms or for governmental organizations. Architects are required to possess a high level of intuitive, analytical, and technical skills combined with a deep understanding of human values and needs.

The construction manager is expected to be conversant in a wide variety of structures that make up man's physical environment. This includes properties of materials and construction systems and how they are fabricated to produce buildings. The student is expected to develop an inquisitive and inventive mind to deal with new construction methods and management techniques. It is also important that the person in construction management be knowledgeable of the field of business. Courses are offered in a variety of departments to assure this breadth of understanding.

The department is a member of the Association of Collegiate Schools of Architecture and the Associated Schools of Construction. Student chapters of the American Institute of Architects and the Associated General Contractors provide a professional link with their professional counterparts. The professional Bachelor of Architecture degree program is accredited by the National Architectural Accrediting Board.

**Description of Courses**

For explanation see Index under "Symbols"

Arch

101 Graphic Communication I 3 (1-6)
Drawing to perceive three-dimensional space; freehand (architectural) drawing, drafting, isometric and orthographic drawing; perspective, shades and shadows, lettering, and rendering techniques.

102 Graphics Communication II 3 (0-6)
Prereq Arch 101. Continuation of Arch 101. Refinement of presentation techniques; exposure to other perspective drawing and presentation methods.

120 [H] Architectural History I 3 Devel-
opment from prehistory to the Gothic Cathedral; influences of society, climate, materials on buildings from simple shelters to monumental architecture.

121 [H] Architectural History II 3 Development of American architecture; cave dwellings, native American progress, colonial styles to contemporary architecture; effects of European styles upon America.

201 Introductory Design I 3 (0-6) Prereq Arch 101, 102. Two- and three-dimensional basic designs as visual and structural phenomena.

202 The Built Environment 3 Planning and design of the built environment; products, interiors, structures, landscapes, cities; factors and process affecting environmental quality.

203 (207) Introductory Design II 3 (0-6) Prereq Arch 201. Determinants of traditional, contemporary and future space enclosure systems.

301 Architectural Design 4 3 (0-12) Prereq major in Arch; c/ / in Arch 307. Small- to large-scale physical planning and architectural design problems with both natural and urban contexts.

303 Architectural Design 4 3 (0-12) Prereq Arch 301; c/ / in Arch 309. Continuation of Arch 301. Program analysis; conceptual and definitive design of small- to medium-scale architectural projects within the contemporary social and technological context.

307 Architectural Design Determinants 2 Prereq major in Arch; c/ / in Arch 301. Natural and human systems and technical factors affecting physical planning and architectural design.

309 Architectural Design Determinants 2 Prereq Arch 307; c/ / in Arch 303. Factors affecting the design of small- to medium-scale architectural projects within contemporary and technological context.

323 Ancient to Medieval Architecture 2 Prereq major in Arch. Development of western architecture from prehistory to late medieval: social, technical, and scientific influences.

324 Renaissance to 19th Century Architecture 2 Prereq Arch 323. Western architecture from the Renaissance and Baroque to the pioneers of the modern movement.

331 Materials and Construction I 3 Prereq Arch 101. Properties of building materials and construction applications.

332 (355) Materials and Construction II 3 (2-3) Prereq major in Arch or Cst M. Theory and application of various construction systems and materials; wood, masonry, concrete, steel utilizing contemporary communication.

342 Urban Theory 3 Prereq junior in Arch or Cst M. Principles and theories of urban and regional planning.

351 Architectural Structures I 3 Prereq junior in Arch or Cst M. Introduction to statics and mechanics; analysis and design of statically determinate architectural structures using timber, steel, and reinforced concrete systems.

352 Architectural Structures II 3 Prereq Arch 351. Continuation of Arch 351.

386 Reading Examination V 1-3 Prereq major in Arch or Cst M. Examination of summer reading from lists prepared by department.

401 Architectural Design 5 3 (0-10) Prereq Arch 303; c/ / in Arch 407. Program analysis; conceptual and definitive design of medium- to large-scale architectural projects within contemporary social and technological context.

403 Architectural Design 5 3 (0-15) Prereq Arch 401; c/ / in Arch 409. Contextual analysis; planning; conceptual and definitive design of community- or city- scale projects or institutions.

407 Architectural Design Determinants 2 Prereq Arch 309; c/ / in Arch 401. Factors affecting the design of medium- to large-scale architectural projects within contemporary social and technological context.

409 Architectural Design Determinants 2 Prereq Arch 407; c/ / in Arch 403. Factors affecting the planning and design of community- or city-scale projects or institutions.

411 Architectural Design 6 3 (0-18) Prereq Arch 403; c/ / in Arch 415. Integration of architectural determinants; programming, space and site plans, physical science, interiors and landscaping.

413 Terminal Design Project 6 3 (0-12) Prereq Arch 411, 415. Architectural project selected by the student and approved by the faculty.

415 Programming and Decision Theory 2 Prereq c/ / in Arch 411. Issues involved in organizing the information necessary to design; collection, organ-
ization, and preparation of program for terminal project.

423 Twentieth Century Architecture 2 PreReq Arch 324. History from the modern movement to today; principles of architectural design demonstrated in the work of 20th century architects.

424 Conservation of Historic Buildings 2 PreReq Arch 324. Theory and practice of architectural conservation; maintenance, repair, restoration, adaptive reuse; historic districts; incentives.

425 Architectural Theory I 2 PreReq Arch 423. Architectural criticism and evaluation as viewed from contemporary and historical precedents.

426 Architectural Theory II 2 PreReq Arch 423. Theory development and its effect on the design process.

432 Environmental Control of Buildings I 3 (2-2) PreReq major in Arch or Cst M. Building heating, ventilating, air conditioning systems, large and small scale; heat flow concepts; plumbing and water supply systems.

433 Environmental Control of Buildings II 3 (2-2) PreReq Arch 432. Building lighting, performance criteria and design; electrical distribution for large and small buildings, vertical transportation; building communication systems.

434 Acoustics 1 PreReq major in Arch or Cst M. Sound theory, control, acoustics, and reinforcement systems as applied to architectural problems.

437 Energy Use in Buildings 2 PreReq Arch 432. Energy use in contemporary buildings; conservation and alternate energy sources.

451 Construction Practice Management 3 (2-3) PreReq senior in Cst M. Construction industry organization and ethics; contract documents, their relationships, meanings, and significance in construction.


455 Critical Path Management Techniques 1 PreReq senior in Cst M or Arch. Architectural and construction applications for network programming and scheduling techniques.

461 Architectural Structures III 3 PreReq Arch 303, 352. Wind and seismic loads on architectural structures; high-rise structure systems; reinforced masonry systems, earth retaining structures and foundation systems.

462 Architectural Structures IV 3 PreReq Arch 401, 352. Deflection theory; analysis of statically-indeterminate architectural structure systems; case studies in preliminary architectural engineering for buildings.

470 Architectural Economics 3 PreReq senior in Arch or Cst M. Theory and practice of cost benefit analysis applied to architectural systems.

472 Construction Communications/Costs/ Codes 2 PreReq major in Arch. Design and construction delivery systems; codes, costs, specifications, manuals, and contract documents.

473 Architectural Business 2 PreReq Arch 472. Architect licensing process; techniques for and rationale of marketing architectural services; office organization and business methods applied to architecture.

480 Architecture Internship V 1-16 May be repeated for credit; cumulative maximum 16 hours. PreReq major in Arch or Cst M. Placement in an approved industrial, professional, or governmental situation for specialized or general experience.

490 Seminar in Architectural Design 1 May be repeated for credit; cumulative maximum 4 hours. PreReq major in Arch. Advanced study in architectural design.

491 Seminar in Architectural Communications 1 May be repeated for credit; cumulative maximum 4 hours. PreReq major in Arch. Advanced study in graphic communication.

492 Seminar in Architectural History 1 May be repeated for credit; cumulative maximum 4 hours. PreReq major in Arch; Arch 426. Advanced study in architectural history.

493 Seminar in Environmental Control I 1 May be repeated for credit; cumulative maximum 4 hours. PreReq major in Arch or Cst M. Advanced study in environmental control of buildings.

494 Seminar in Urban and Regional Planning 1 May be repeated for credit; cumulative maximum 4 hours. PreReq Arch 342. Advanced study in urban and regional planning.

495 Seminar in Construction Management 1 May be repeated for credit; cumulative maximum 4 hours. PreReq senior in Cst M. Advanced study in construction
practice management.

496 Seminar in Computer Application I May be repeated for credit; cumulative maximum 4 hours. Prereq Cpt S 203. Architectural and construction applications of computers in graphics, management, structures.

497 Seminar in Professional Practice I May be repeated for credit; cumulative maximum 4 hours. Prereq senior in Arch. Advanced study in architectural practice management.

498 Seminar in Architectural Structures I May be repeated for credit; cumulative maximum 4 hours. Prereq Arch 301, 351 or c//. Advanced study in architectural structures systems.

499 Special Problems V 1-4 May be repeated for credit.

General Requirements

1. Students who wish to transfer from another institution may find it possible to take some or all of the first two years elsewhere. See the WSU bulletin, Transfer Programs for Community Colleges, or contact the department for information.

2. A student may not take any courses required by the department on a pass-fail basis without written permission of the adviser.

3. Under no circumstances may a student be enrolled in 300- or 400-level architecture courses without acceptance into and certification as a major in either Architecture or Construction Management.

4. Due to limitations of space and faculty, certification as a major in Architecture or Construction Management can be granted to only the most qualified students, based on satisfaction of minimum requirements, overall grade point, and demonstrated abilities.

Prospective applicants for certification are responsible for acquainting themselves with all requirements and procedures.

Schedule of Studies

PRE-ARCHITECTURE

Students who enter WSU as freshmen and have an interest in architecture should obtain an adviser in the Department of Architecture through the Curriculum Advisory Program. Specific requirements of the pre-architecture program are:

Complete 60 hours and 2 years of college-level work including the following:

**Freshman Year**

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Math 107</td>
<td>4</td>
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<tr>
<td>Com Prof GUR</td>
<td>3</td>
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<tr>
<td>Arch 101 Graphic Communication</td>
<td>3</td>
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<tr>
<td>Hum GUR</td>
<td>3</td>
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<tr>
<td>Soc S GUR</td>
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<table>
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<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tr>
<td>Math 171 or 206</td>
<td>4-3</td>
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<tr>
<td>Arch 102 Graphic Communication</td>
<td>3</td>
</tr>
<tr>
<td>Com Prof GUR</td>
<td>3</td>
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<tr>
<td>Soc S GUR</td>
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<td>Elective</td>
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**Sophomore Year**

<table>
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<tr>
<th>First Semester</th>
<th>Hours</th>
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<tr>
<td>Phys 201 or 101</td>
<td>4</td>
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<tr>
<td>Arch 201 Intro Design</td>
<td>3</td>
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<tr>
<td>Arch 331 Mat and Const</td>
<td>3</td>
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<tr>
<td>Electives</td>
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<table>
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<tr>
<th>Second Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Ph S Elective</td>
<td>3-4</td>
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<tr>
<td>Arch 203 Intro Design</td>
<td>3</td>
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<tr>
<td>Hum GUR</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>6</td>
</tr>
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</table>

**PROFESSIONAL PROGRAM**

Upon completion of the Pre-Architecture Program requirements or their equivalent for transfer students, application must be made for admission to the third year Professional Program (see requirements below). Successful completion of the three-year Professional Program requirements totaling 90 semester credits minimum, lead to the degree of Bachelor of Architecture. This accredited degree plus three additional years of professional experience and successful completion of the architectural license examination qualifies a person for registration as a licensed architect in the state of Washington.

Professional Program Entry Requirements

1. Satisfactory completion of all Pre-Architecture requirements or their equivalents including 60 semester credits total.

2. Submission of application for entry. Forms and instructions for application are available from the Office of Admissions and must be submitted prior to March 1 preceding fall registration. Transfer students must also submit an Application for Admission to the university. Successful applicants will be notified prior to June 1.
NOTE: Satisfactory progress in the Professional Program requires a grade of C or better be earned in all architectural design and determinants courses in the third, fourth, and fifth years.

**Junior Year**

*First Semester*
- Arch 301 Design 4
- Arch 307 Determinants 2
- Arch 323 History 2
- Arch Elective 3
- Arch 498 Struct Sem 1
- Arch 351 Structures I 2

*Second Semester*
- Arch 303 Design 4
- Arch 309 Determinants 2
- Arch 324 History 2
- Arch 432 Env Control Bldgs 3
- Arch 498 Struct Sem 1
- Arch 352 Structures II 3

**Senior Year**

*First Semester*
- Arch 401 Design 5
- Arch 407 Determinants 2
- Arch 423 History 2
- Arch 433 Env Control II 3
- Structures Elective 3

*Second Semester*
- Arch 403 Design 5
- Arch 409 Determinants 2
- Env Control Elective 3
- Elective 3
- Arch Elective 4

**Fifth Year**

*First Semester*
- Arch 411 Design 6
- Arch 415 Programming 2
- Arch Elective 3
- Arch 472 Const Comm 2
- Elective 2-3

*Second Semester*
- Arch 413 Design 6
- Arch 473 Business 2
- Electives 3
- Arch Elective 4

**BACHELOR OF SCIENCE IN ARCHITECTURAL STUDIES**

The Bachelor of Science in Architectural Studies is a program primarily for those who want to terminate their studies at the end of four years.

If, after being admitted into the department and spending at least one semester in the professional program, students find that their interests lie in a different but related area or specialty, they may choose to move into the architectural studies program. It can be used to help prepare a student to work in related fields such as technology, management, or community or regional development. It may be used as a foundation for graduate work in these areas.

It must be clearly understood that this program does not necessarily prepare a student for admission into the fifth year of the professional program nor prepare graduates for the Architect's License Examination.

All students desiring to obtain the architectural studies degree must certify as majors in that program for at least two semesters prior to graduation. At the time of certification, a specific schedule of studies leading to the degree will be developed by the student in consultation with the adviser.

**Program Requirements:**

1. Completion of the pre-architecture requirements and admission into the pre-professional program.

2. a. Arch 301, 307, 303, and 309 and completion of at least 25 additional upper-division credit hours in or supporting an area of emphasis. Specific schedule of studies must be approved, OR
   b. Completion of all required courses in the third and fourth years of the pre-professional architectural program.

**BACHELOR OF SCIENCE IN CONSTRUCTION MANAGEMENT**

The degree of Bachelor of Science in Construction Management is for those students who wish to work in the profession of construction management or in a management capacity in other facets of the construction industry.

Upon completion of the Pre-Architecture (Construction Management) Program requirements, or their equivalent for transfer students, application must be made for certification into the Construction Management program.

**Certification Requirements**

1. Satisfactory completion of a minimum of 45 semester credits including those courses or their equivalents in the first three semesters below.

2. Must have passed the following courses with a grade of "C" or better.

   Arch 101 Graphic Communications
   Phys 101 General Physics
Acctg 230 Principles of Accounting I
3. Submission of the "Academic Record Sheet." Forms and instructions for application are available from the Office of Admissions and must be submitted prior to January 15 proceeding spring registration. Transfer students must also submit an Application for Admission to the university. Successful applicants will be notified prior to the beginning of the spring semester.

**Freshman Year**

**First Semester**  
Com Prof GUR  
Math 107 Precalculus  
Arch 101 Graphic Comm I  
Humanities GUR  
Phys 101 General  
**Hours** 3 4 3 3 4  

**Second Semester**  
Com Prof GUR  
Math 206 Math Arch  
Econ 102 Economics  
Humanities GUR  
Phys 102 General  
**Hours** 3 3 3 3 4

**Sophomore Year**

**First Semester**  
Acctg 230 Accounting  
Econ 203 Economics  
Cpr S 150, 153  
Elective  
**Hours** 3 3 4 3  

**Second Semester**  
Acctg 231 Accounting  
B Law 210 Business Law  
Arch 331 Materials  
C E 101 Surveying  
Elective  
**Hours** 3 3 3 3 3

**Junior Year**

**First Semester**  
Arch 351 Structures  
Ins 320 Insurance  
Arch 434 Acoustics  
Elective  
Arch 532 Mar and Const  
**Hours** 3 3 1 2 3  

**Second Semester**  
Arch 352 Structures  
Arch 432 Env Controls  
Fin 325 Finance  
Arch 455 CPM in Const  
Elective  
**Hours** 3 3 3 1 5  

**Senior Year**

**First Semester**  
Arch 451 Const Practice  
Personnel Elective  
**Hours** 3 3

Arch 433 Env Controls  3  
Arch 495 Const Seminar  1  
Arch 470 Estimating  3  
Electives  4

**Second Semester**  
Arch 452 Const Practice  3  
Approved Bus/Econ Elective  3  
Elective  1  
Arch 342 Urban Theory  3  
Arch 495 Const Seminar  1

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**Program in Asian American Studies**

**Director, G. Nomura; Assistant Professor, S. Sumida.**

Asian American Studies offers an interdisciplinary study designed to provide a broad systematic understanding of Asian/Pacific Americans, quite distinct and apart from the traditional cultures of their forebears.

This program serves the following objectives:

1. An understanding of the humanistic, historical, social, economic, psychological, and political forces which have shaped Asian/Pacific American cultural heritages;

2. A review of the issues confronting contemporary Asian/Pacific American communities;

3. The development of resource materials for further in-depth research and study of the Asian/Pacific American experience.

A minor in Asian American Studies is offered. The minor requires 17 hours of credit chosen from the list below, including: (1) a minimum of 8 hours at the 300-level and above; and (2) 9 hours from the following core courses: AAS 201, 205, 301, 311, 405, 406, 495.

**Description of Courses**

*For explanation see Index under "Symbols"*

**AAS**

201 [S] Introduction to Asian American History 3  
History of Asian/Pacific Americans from the 19th century to 1965.

203 [S] Peoples of the World 3 Same as Anth 203.

205 Socio-Cultural Analysis of Asian American Communities 3 Multidisciplinary analysis of Asian/Pacific America
community development, structures, and issues; compares and contrasts new emerging communities with the old.

275 [S] Introduction to East Asian Culture 3 Same as Hist 275.

301 Contemporary Issues, 1965-Present 3 Social-psychological, political, economic, educational, and cultural issues which shape Asian/Pacific American identity and community today.

311 Asian American Literature 3 Asian American fiction, drama, poetry, and other arts, 1900-present; impact of Asian/Pacific American culture and experience upon these works.

315 Philosophy and Religion of China and Japan 3 Same as Phil 315.

358 Current Issues in Education 2 Same as Educ 358.

359 Current Issues in Education 2 Same as Educ 359.

405 Asian Communities in the American West, 1840 to 1940 3 Establishment of major Asian communities in the American West in light of political, economic, and social conditions before 1940.

406 Asian Americans in Contemporary Society 3 Asian/Pacific Americans in contemporary society with respect to their achievements, communities, issues, and activities in major institutions.

410 Ethnic Groups and Public Education 2 or 3 Same as Educ 410.

412 American Diplomatic History in the Twentieth Century 3 Same as Hist 412.

419 United States 1941-Present 3 Same as Hist 419.

421 The American Frontier 3 Same as Hist 421.

422 Political and Social History of the Pacific Northwest 3 Same as Hist 422.

424 Peoples of the Pacific 3 Same as Anth 424.

476 Revolutionary China, 1800 to Present 3 Same as Hist 476.

477 Modern Japanese History 3 Same as Hist 477.

495 Special Topics in Asian American Studies 3 May be repeated for credit; cumulative maximum 6 hours.

499 Special Problems V 1-4 May be repeated for credit.

Program in Astronomy

Professor and Program Head, T. E. Lutz; Professor, A. Marcus; Associate Professor, J. H. Lutz; Assistant Professor, B. Srinivasan; Visiting Professor, T. Ingerson.

Astronomy is the study of celestial bodies including the sun, planets, satellites, stars, and galaxies. The various courses offered in astronomy are intended to provide background for both liberal arts and science majors. The astronomy faculty are part of the Department of Pure and Applied Mathematics. The WSU Planetarium and the Jewett Observatory are used as instructional aids in the astronomy courses.

A minor in astronomy requires 16 hours as follows: a minimum of 10 hours upper-division astronomy courses which must include Astr 345 and at least one hour of Astr 499; 6 hours from Cpt S 330; Hist 381; Math 440, 441, 448; Phys 320, 341, 342, 350, 443; Stat 430.

Description of Courses

For explanation see Index under "Symbols"

Astr

135 [P] Descriptive Astronomy 3 Physical characteristics and motions of the bodies of the solar system, stars, nebulae, and galaxies. Credit not granted for both Astr 135 and 345.

345 Principles of Astronomy 3 Prereq Phys 102 or 202. Planets, the sun, stars, and galaxies; current topics in astrophysics and planetary research. Credit not granted for both Astr 135 and 345.

390 Aspects of the Night Sky 1 Prereq Astr 135 or 345 or Hist 381. Star names, magnitude scales, constellation identification and mythology, astronomical coordinates, solar, lunar and planetary motions, practical astronomy.

435 Astronomy and Astrophysics 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Math 172. Advanced topics in modern astronomy and astrophysics.

499 Special Problems V 1-4 May be repeated for credit.

538 Topics in Modern Astrophysics 3 May be repeated for credit; cumulative maximum 9 hours. Prereq Math 315. Problems of current astrophysical interest in the areas of stellar atmospheres, stellar interiors, gaseous nebulae, the interstellar medium and galaxies.

600 Special Projects or Independent Study Variable credit.
Department of Bacteriology and Public Health

Professor and Department Head, H. M. Nakata; Professors, D. J. Hinrichs, K. D. Spence; Associate Professors, R. E. Harlbert, L. P. Mallavia, K. L. Melvout, J. L. Pasnakas, W. R. Rayburn; Assistant Professors, W. T. Charnetzky, M. L. Kahn, M. F. Thomashow.

Bacteriology, often and properly called microbiology, is both a basic and an applied science. At the undergraduate level, the Department of Bacteriology and Public Health offers options in general bacteriology, environmental health, and in medical technology, all leading to a Bachelor of Science degree in Bacteriology and Public Health. Majors are required to develop a strong background in the basic sciences before taking courses in bacteriology and those required by the various options. Employment opportunities in industrial, government, hospital, and private laboratories and agencies are excellent for qualified graduates. Field training between the junior and senior years is highly recommended for environmental health majors. A one-year hospital internship in an accredited school of medical technology is required after graduation for those interested in becoming certified medical technologists. Career opportunities in these areas are also excellent. Majors may also prepare for advanced degrees and easily complete the requirements for application to medical, dental, veterinary or other professional schools.

At the graduate level, the department offers programs leading to the degrees of Master of Science in Bacteriology and Public Health and Doctor of Philosophy in Bacteriology. Areas in which the department is prepared to direct research include general and environmental microbiology, microbial ecology, microbial diseases of insects, molecular basis of cell-cell interactions and virulence, cellular immunology, and the regulation of the immune response, biology of microbial membranes, molecular genetics, microbial differentiation and rickettsial- and viral-host relationships.

Description of Courses

BACTERIOLOGY
For explanation see Index under "Symbols"

Bact
101 (B) Elementary Bacteriology and Public Health 4 (3-3) Students who receive a B grade in this course may substitute it for Bact 201 as a prereq for advanced courses. Biology of bacteria with special reference to man. Credit not granted for both Bact 101 or 201.
201 General Microbiology 5 (3-6) Prereq 1 yr college chem; 1 sem college biology. The classification, physiology, and techniques for cultivation of microorganisms, especially bacteria; applications to agriculture, medicine, and industry.
310 Medical Bacteriology 3 Prereq Bact 201; Chem 240. The bacterial pathogens and their relationship to disease.
311 Diagnostic Medical Bacteriology 2 (0-6) Prereq Bact 310 or c/. Techniques and tests for the identification of bacteria pathogenic for man.
365 Microbiology and Chemistry of Waters 3 (1-6) Prereq Bact 201. Major microbiological and chemical water pollutants; detection and removal.
410 Advanced Medical Microbiology and Mycology 3 Prereq Bact 310. Analysis of bacterial virulence determinants; fungal infections of man. (a/y)
412 Immunology 4 (2-6) Prereq Bact 310; Org Chem. Principles.
414 General Virology 3 Prereq GenCB 301; Org Chem. The biology of bacterial, animal, and plant viruses. Credit not granted for both Bact 414 and 415.
415 General Virology Laboratory 2 (0-6) Prereq Bact 414 or c/. Laboratory techniques concerning cultivation and characterization of viruses.
416 Microbiology of Foods 3 (2-6) Prereq Bact 201; Org and Quant Chem. Microorganisms important in food; reference to spoilage processes and their control.
420 Epidemiology 3 Prereq Bact 310. Epidemiological concepts; theoretical and quantitative aspects of distribution, dynamics, and determinants of disease in human populations.
428 Basic and Applied Microbial Physiology 3 Prereq Bact 201; BC/BP 364. Basic microbial physiology and its relevance to the processes of applied microbiology. Credit not granted for both Bact 428 and 528.
490 Field Training for Environmental Health Specialists 8 Prereq Bact 310,
311; junior or senior in Bact. Practical field training in environmental health with participation in an organized public health program.

499 Special Problems V 1-4 May be repeated for credit.

510 Molecular Biology of Microbial Morphogenesis 2 Current literature dealing with the molecular biology of microbial systems; models of eucaryotic differentiation. (a/y)

512 Immunology 3 The immune system at the animal, cellular, and molecular levels.

513 Research Techniques in Immunocemistry/Biology 2 (0-6) Prereq c/ in Bact 512 or intro immunology course.

514 General Virology 3 Graduate level counterpart of Bact 414; additional requirements. Credit not granted for both Bact 414 and 514.

528 Basic and Applied Microbial Physiology 3 Graduate level counterpart of Bact 428; additional requirements. Credit not granted for both Bact 428 and 528.

529 Research Techniques in Microbiology 3 (1-6) By interview only. Modern biochemical and physiological techniques for research studies in microbiology.

541 Seminar 1 May be repeated for credit. Literature reviews and research reports.

550 Mechanisms of Pathogenesis 2 Prereq Bact 310. Specific bacterial products and unique bacterial capabilities which enhance the virulence of individual organism. (a/y)

555 Intracellular Parasites 2 Prereq Bact 310; BC/BP 364. Bacteria which function as facultative or obligate parasites; bacterial factors which enhance and/or necessitate intracellular growth. (a/y)

556 Phycology 4 (3-3) Same as Bot 556.

560 Molecular Genetics 3 Same as GenCB 560.

570 Advanced Immunology 3 Prereq introductory course in immunology. Cellular and molecular regulation of the immune response. (a/y)

580 (514) Selected Topics in Microbiology 1 May be repeated for credit; cumulative maximum 2 hours. Prereq 9 hrs upper-division Bact.

592 Advanced Topics in Cell Biology 1-3 May be repeated for credit; cumulative maximum 7 hours. Same as GenCB 592.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in this department must be in upper-division courses. For majors, a total of 28 credit hours must be in the departmental courses and a minimum g.p.a. of 2.0 is required in these courses for graduation. The core requirements for the freshman and sophomore years are the same for bacteriology, medical technology, and environmental health options. None of the core courses or departmental courses may be taken pass-fail.

Core Requirements

Bio S 103, 104; Chem 105, 106, 207, 240; Math 107; Phys 101, 102; BC/BP 364, 366.

Bacteriology Option

Bact 310, 311, 412, 414, 415, 9 additional hours Bact; GenCB 301, and one advanced lecture-lab course outside the department are required as a minimum. Those contemplating graduate study are urged to take Chem 340-343 series in lieu of Chem 240, 371, 372; Math 171, 172.

Medical Technology Option

Same as Bact option except that Bact 350 and Zool 417 are required. Bact 350 partially fulfills requirement for 9 credits of Bact electives and Zool 417, the requirement for one advanced lecture-lab course outside the department. Bact 410 and Zool 251 are strongly recommended.

Environmental Health Option

Bact 310, Env H 350, 360, 365, 410, 420, 450 and Biom 412 are required. In addition, two area tracks are available: General Sanitation: Bact 416, Soils 404 and either Entom 448 or Zool 417. Occupational Health: Zool 251, Chem 427, V Ph 523.

Transfer Students

Students transferring from other institutions as juniors should have taken the equivalent of Bact 201; Chem 105, 106, and 217 or 240 (preferably both); Engl 101; Bio S 103, 104; one year of one modern foreign language in
college or two years in high school; and part of the required 21 hours in social sciences and humanities. The other required courses normally taken in the first two years may be taken in the upper-division program.

Preparation for Graduate Study
For admission to graduate study in bacteriology a student should have a bachelor's or master's degree and should present evidence of proficiency in academic work. Normally the applicant should have an undergraduate major in bacteriology, biological science, or chemistry; however, candidates with a good record in related fields may be well prepared for certain areas of advanced study in bacteriology.

Program in Biochemistry and Biophysics


Biochemistry and biophysics are interdisciplinary sciences which involve the application of methods and theories of chemistry and physics to the study of biological phenomena. The Program in Biochemistry and Biophysics includes faculty from chemistry, the Institute of Biological Chemistry and genetics and cell biology. Its purpose is to provide the specialized guidance and training necessary for students who wish careers in these modern areas of science. In addition, special options are available for students interested in premedicine, predentistry, and prevetinary science.

Program members are all active in research and have interests in: function and mechanism of contractile proteins, nuclear magnetic resonance studies of membranes and proteins, DNA repair mechanisms and chromatin structure, the structure and function of membrane components, control of eucaryotic gene expression, evolution of macromolecules, the biosynthesis and metabolism of waxes, inositol, monoterpenes, and other plant components, the structure and function of plant protease inhibitors, microbial metabolism and its regulation, evolution and function of the enzyme isocitrarte lyase, nematode development, the role of metabolites in animal diseases, mechanisms of hormonal control in animal systems, basic processes of the immune response, cell regulation by cyclic nucleotides, photosynthesis, structure and biosynthesis of glycoproteins, structure and function of fatty acid synthetase, chemotaxis, synthesis and export of bacterial proteins.

Undergraduate students interested in biochemistry should obtain a general background in biology, physics, chemistry and mathematics during the freshman and sophomore years.

Students interested in biophysics should obtain similar basic preparation and during the junior and senior years add advanced courses in a related field, e.g., physics, chemistry, or biochemistry. Within the major of biochemistry, pre-medical, -dental or -veterinary medicine options are available. The undergraduate minor in biochemistry requires a one semester analytical chemistry course with laboratory and two semesters of organic chemistry with laboratories each semester. In addition, the minor requires BC/BP 364 plus 7 additional units of biochemistry/biophysics (excluding BC/BP 563 or 564), 2 units of which must include laboratory courses. (BC/BP 563 plus 564 may be used to satisfy the requirement for 10 units of biochemistry/biophysics.)

The program offers courses of study leading to the degrees of Bachelor of Science in Biochemistry, Master of Science in Biochemistry, and Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

BC/BP
364 Introductory Biochemistry 3 Prereq Chem 106 and 107 or 212; Chem 240 or 340. Modern biochemistry for undergraduates in the biological sciences.
366 Introductory Biochemistry Laboratory 1 (0-3) Prereq BC/BP 364 or c/. Basic biochemical techniques.
371 Principles of Biophysical Chemistry 3 Prereq Chem 106 and 107 or 212; 1 sem OrgChem; 1 yr college physics; Math 172. Foundations of physical chemistry for students in the life sciences; thermodynamics, chemical equilibria, electrochemistry, kinetics.
372 Principles of Biophysical Chemistry 3 Prereq BC/BP 371. Transport processes; elementary quantum theory; chemical bonding; principles and ap-
applications of spectroscopy of macromolecules; statistical mechanics.

381 Biophysical Chemistry Laboratory 1 (0-3) Prereq BC/EP 371 or c/-. Chemical equilibria, thermodynamics, kinetics, and electrochemistry with particular application to life sciences.

382 Biophysical Chemistry Laboratory 1 (0-3) Prereq BC/EP 372 or c/-. Molecular structure, visible and ultraviolet spectroscopy, circular dichroism, resonance, and transport phenomena with particular application to life sciences.

499 Special Problems V 1-4 May be repeated for credit.

560 Molecular Genetics 3 Same as GenCB 560.

561 Biochemistry of Hormones and Hormone Receptors 2 Prereq BC/EP 563. Mechanisms of action of steroid and peptide hormones; methodology used in hormone research. (a/y)

563 General Biochemistry 3 Prereq Chem 212 or 217; 342. Structure and function of proteins and nucleic acids; fundamental principles of enzymology; chemical aspects of molecular biology.

564 General Biochemistry 3 Prereq BC/EP 563. Carbohydrate, amino acid and lipid metabolism and its control; biochemistry of vitamins; bioenergetics; photosynthesis; dinitrogen fixation.

565 Physical Biochemistry 3 Prereq 1 yr PChem; BC/EP 563 or c/-. Statistical thermodynamics of solutions of macromolecules and macromolecular structure; transport processes; biochemical spectroscopy. (a/y)

566 Biochemical Techniques 3 (1-6) Prereq BC/EP 564 or c/-. Advanced research methods.

567 Proteins and Enzymes 3 Prereq BC/EP 563. Enzyme mechanisms; protein structure and function; protein evolution. (a/y)

568 Advanced Topics in Biochemistry V 1-3 May be repeated for credit. Prereq BC/EP 564. Recent research in selected areas of biochemistry.

569 Nucleic Acid Biochemistry 3 Prereq BC/EP 563. Chemical and biological properties of DNA and RNA; enzymes acting on nucleic acids and current experimental methods. (a/y)

572 Magnetic Resonance 3 Prereq Chem 332. Basic theory and applications of NMR and ESR. (a/y)

591 Biochemistry Seminar 1 May be repeated for credit; cumulative maximum 5 hours. Required of all graduate students in biochemistry.

592 Advanced Topics in Cell Biology 1-3 May be repeated for credit; cumulative maximum 7 hours. Same as GenCB 592.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Freshman Year

First Semester

Chem 105 Principles 1 4
Bio S 103 Introductory 4
Engl 101 Composition 3
Math 107 Precalculus 3
Hum or Soc S Elective 3

Second Semester

Chem 106 Principles 1 3
Chem 107 Qual Analysis 2
Bio S 104 Introductory 4
Math 171 Calculus I 4
Engl 201 Expository Writing 2 3

Sophomore Year

First Semester

Chem 340 Organic 3
Chem 341 Organic Lab 2
Chem 221 Quant Analysis 4
Math 172 Calculus II 4
Hum or Soc S Elective 3

Second Semester

Chem 342 Organic 3
Chem 343 Organic Lab 2
Phys 201 Class Phys 4
Math 220 Linear Alg 2
Hum or Soc S Elective 4

Junior Year

First Semester

Phys 202 Class Phys 4
BC/EP 371 Biophys Ch 3
BC/EP 381 BP Chem Lab 1
GenCB 301 General 3
Foreign Language 4
This program leads to the degree of Bachelor of Science in Biology and Master of Science in Biology.

Four options are available for the Bachelor of Science degree: botany, general genetics, and biology education. A minor in biology is offered.

**Description of Courses**

For explanation see Index under "Symbols"

Bio S

101 [B] An Integrated Course in the Biological Sciences 3 Not open to students who have taken a college level course in general biology or botany. Credit not granted for more than one of Bio S 101, 102, 103.

102 [B] General Biology 4 (3-3) Not open to students who have taken a college-level course in general biology or botany. Nature of living things, methods, and function of diverse organisms. Credit not granted for more than one of Bio S 101, 102, 103.

103 [B] Introductory Biology 4 (3-3) Prereq 1 sem Chem or c/. First semester of a one-year sequence. Recommended for pre-professional students. The nature of life, structure, function, genetics, growth, and development. Credit not granted for more than one of Bio S 101, 102, 103.

104 [B] Introductory Biology 4 (3-3) Prereq Bio S 103 (Bio S 101 or 102 with a grade of A or B may be substituted); 2 sem Chem or c/. Continuation of Bio S 103. Biology of organisms; plants, animals, bacteria, ecology, and evolution.


372 General Ecology 4 (3-3) Environmental biology, unifying principles of ecology, populations, ecosystems, and human's role in a changing environment; introduction to human ecology.


430 Methods of Teaching Science 3 (2-3) Prereq 12 hrs science. Methods, philosophy, and structure of science with reference to their application in teach-
ing secondary school science courses.

440 Radiation Ecology 2 Same as Zool 440. (a/y)

450 Cell Biology 3 Same as GenCB 450.

474 Human Ecology 3 Prereq Bio S 104. Biological basis of interdisciplinary human ecology; applicability of ecological principles to Homo sapiens; emergence of man as the ecological dominant.

490 Natural History of Salmon River Canyon 2 Field course involving a guided raft trip with emphasis on the ecology, limnology, wildlife, and vegetation of the main Salmon River Canyon.

491 Natural History of Middle Fork Salmon River Canyon 2 Guided raft trip emphasizing the ecology, limnology, wildlife, and vegetation of Middle Fork Salmon River Canyon.

492 Natural History of Upper Main Salmon River 2 Field course involving a raft trip and emphasizing the ecology, limnology, wildlife, and vegetation of the Upper Main Salmon River Canyon.

499 Special Problems V 1-4 May be repeated for credit.

530 Statistical Ecology 3 Same as Zool 530. (a/y)

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study and/or Examination Variable credit.

Schedule of Studies

At least 40 of the total hours required for the bachelor's degree must be in upper-division courses. A student majoring in biology is required to take a minimum of 40 hours in biological science courses.

All majors are required to take the following courses: Bio S 103, 104, Bact 101 or 201, Bot 201, Zool 224, 225, GenCB 301, Chem 240 or 340 and 341, Phys 101 and 102 or 201 and 202, and Math 107.

In addition to the above requirements, students selecting the option must take:

General Option: Bio S 372 and a minimum of 12 additional hours in biological science including at least one course from Bot 322, 411, Entom 343, Zool 332, 417, 423, 428; and at least one course from Bot 320, Bio S 450, Zool 352, 353. Zool 405 is recommended.

Botany Option: Bio S 372, Bot 320, 332, 411 or 551, 460 or 462; electives from Bot 405, 410, 430, 436, Pl P 329, 421; Math 171 and 172 or Biom 412 or Cpt S 150 and 151, 152, 153 or 154. Chem 340, 341, 342, 343 and BC/BP 364 are recommended.

Genetics Option: GenCB 402, 499, BC/BP 364; at least one course from Bact 428, 429, Bot 320, GenCB 450, Zool 352; a minimum of six hours from GenCB 430, 502, 511, Hort 345, A S 364, Zool 405; and Math 171. Biom 412, Chem 340, 341, 342, 343, and Math 172 are recommended.

Biology Education Option: Bio S 430 and a minimum of 14 additional hours in biological science including at least one course in botany and one course in zoology; at least one course from Bot 322, Entom 343, Zool 332, 423, 428; at least one course from Bact 428, Bio S 450, Bot 320, Zool 352, 353; at least one course from Bio S 372, 474, Zool 330, 405; Geol 101 or Astr 135 for junior high candidates: Educ 300, 301, 303, 358 or 359, 402, 403 or 404, and 405 or 406; Psych 102 and H Ed 480 or 481.

Transfer Students

Transfer students must satisfy the program requirements for graduation. Science courses taken at other institutions will be evaluated and credits accepted where possible. Inquiries should be directed to the Program Head.

Preparation for Graduate Study

Students with undergraduate majors in such fields as bacteriology, biology, botany, zoology, and plant or animal sciences in the College of Agriculture may be prepared for graduate study in biology. Graduate Record Examination scores from the General Aptitude and Advanced Biology section are required.

Program in Black Studies

Assistant Professor and Director, F. Boateng; Associate Professor, T. Anderson; Assistant Professors, H. Shwunda, I. Smith; Teaching Assistant, H. Young.

The Black Studies Program examines from an interdisciplinary approach the historical, social, political behavior and economic experience of Afro-Americans and peoples of African descent.
throughout the world. The program teaches
the history of Afro-Americans and their con-
temporary status; the form and meaning of
the artistic expression of Afro-Americans and
Africans; and the similarities, distinctions, and
interaction between peoples of European and
of African descent in America.

The program is committed to the functions
of teaching, research, and community service
which serves to prepare the student for career
opportunities in the social and behavioral sci-
ences, and in the arts and humanities. Students
majoring in Black Studies and minors in an-
other area can move professionally into rel-
ated fields of graduate study offered by the
university.

Elected Black Studies courses provide non-
majors the opportunity to acquire knowledge
of Black people in the Americas, Africa, and
the Caribbean. The courses might also pro-
vide teachers with the background and train-
ing to teach Black-oriented courses.

The course of study leads to the degree of
Bachelor of Arts in Black Studies.

**Description of Courses**

For explanation see Index under "Symbols"

**Bl St**

101 [S] Introduction to Black Studies 3
Historical, cultural, sociological, and
political experiences of black people in
America and Africa.

102 [H] Black Visual Arts 3 Survey of
visual art from prehistoric Africa
through the modern black artist.

230 Food and Cultures of African Peoples
3 Same as HNF 230.

262 Music of Black Americans 2 Same as
Mus 262.

301 Spoken Swahili I 4 Conversational
Swahili designed to give basic knowl-
edge of the spoken language.

302 Spoken Swahili II 4 Continuation of
Bl St 301. Leads toward fluency in con-
versational Swahili.

310 [S] Afro-American History I 3 Historical
experiences of Blacks in America
from 1619 to 1899.

311 [S] Afro-American History II 3 Same as
Hist 311.

313 Civil Rights Movement in America 3
Historical development and analysis of
the Civil Rights Movement in the
United States from 1900 to present.

314 African History and Cultures 3 His-
torical development of Africa from the
era of conquest to colonialism and in-
dependence.

319 [H] Black Literature in America 1700-
1900 3 Survey of black literature cover-
ing the 18th century to early 1900.

320 [H] Black Literature in America, 1900
to Present 3 Same as Engl 320.

324 [S] Black Politics 3 Same as Pol S 324.

325 Women and Minorities in the Econ-
omy 3 Same as Econ 325.

370 [S] History of Blacks in the Western
U.S. The role and contributions of
blacks in the development of the West-
ern United States.

381 [S] Sociology of Black Americans 3
Same as Soc 381.

384 Topics in Afro-American Politics 3
Contemporary social, political, and
economic issues and influences affect-
ing the black population and the Amer-
ican polity.

410 Ethnic Groups and Public Education
2 or 3 Same as Educ 410.

420 Pan-Africanism and Black Ideology 3
Philosophical development, structure,
and movement toward African unity.

424 South Africa: From Pre-European Set-
tlement to Present 3 Prereq junior or
senior standing. The political, social,
and economic history of South Africa
in relation to current international
events and affairs.

454 The Black Family 3 Unique cultural
aspects of love, courtship, marriage,
and family styles of Black people as
affected by institutional racism in
America.

491 Education and Social Change in Africa
3 The role of education in the social,
political, and economic changes in Afri-
can countries; African education and
the modernization process.

498 Seminar 2 May be repeated for credit.

499 Special Problems V 1-4 May be repeat-
ed for credit.

**Schedule of Studies**

A Bachelor of Arts degree in Black Studies
requires a minimum of 37 hours in Black
Studies. A minor in Black Studies requires a
minimum of 18 hours including Bl St 310,
311, 314, and 381. Additional hours in Black
Studies may be elected by the student with the
advice of the Program Adviser. At least 40
of the total hours required for the bachelor's
degree in this program must be upper-division
courses. Students planning to transfer to this program should have completed all General University Requirements.

Majors are advised to complete the following courses during the freshman and sophomore years in addition to General University Requirements:

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bl St 101 Introduction to Black Studies</td>
<td>3</td>
</tr>
<tr>
<td>Bl St 102 Black Visual Arts</td>
<td>3</td>
</tr>
<tr>
<td>Bl St 262 Music Black Am</td>
<td>2</td>
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</tbody>
</table>

In addition majors are required to take the following upper-division courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Bl St 310 Afro-American History I</td>
<td>3</td>
</tr>
<tr>
<td>Bl St 311 Afro-American History II</td>
<td>3</td>
</tr>
<tr>
<td>Bl St 314 African Hist Cult</td>
<td>3</td>
</tr>
<tr>
<td>Bl St 319 Black Lit Amer</td>
<td>3</td>
</tr>
<tr>
<td>Bl St 320 Black Lit Amer</td>
<td>3</td>
</tr>
<tr>
<td>Bl St 324 Black Politics</td>
<td>3</td>
</tr>
<tr>
<td>Bl St 370 Hist Blacks West</td>
<td>3</td>
</tr>
<tr>
<td>Bl St 381 Soc Black Amer</td>
<td>3</td>
</tr>
<tr>
<td>Bl St 410 Ethnic Groups Pub Educ</td>
<td>3</td>
</tr>
<tr>
<td>Bl St 424 South Africa</td>
<td>3</td>
</tr>
<tr>
<td>Bl St 498 Seminar</td>
<td>2</td>
</tr>
<tr>
<td>Bl St 499 Special Problems</td>
<td>2</td>
</tr>
</tbody>
</table>

Recommended electives for program majors and minors: Bl St 301, 302, 262, 384, 312, 454; Soc 220, 321; and Educ 491.

Department of Botany


Botany is the basic plant science. The courses offered in the department are designed to meet the needs of three groups of students: (1) those planning to specialize in an applied science such as agronomy, bacteriology, forestry, horticulture, pharmacy, plant pathology, range management, and wildlife biology; (2) those wishing to study a biological science for its cultural or educational value; and (3) those who plan to specialize in botany. Those in the first group will desire to obtain as comprehensive a knowledge of the field as time will permit. The second group may find one year of introductory work sufficient. For the third group the department offers courses leading to advanced degrees in botany.

The department has laboratories and equipment suitable for graduate study in the major areas of botany, and special facilities for work in the fields of biochemistry, biophysics, physiology, chemotaxonomy, cytotaxonomy, anatomy, developmental morphology, ecology-population biology, and ultrastructure.

The department offers courses of study leading to the degrees of Master of Science in Botany and Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Bot


320 Introductory Plant Physiology 3 (2-3) Prereq Bio S 104 or Bot 201; Org Chem. Experimental course covering water relations, mineral nutrition, photosynthesis, respiration, and growth of plants.

329 General Plant Pathology 3 Same as PI P 329.


405 Principles of Organic Evolution 2 Same as Zool 405.


411 Plant Morphology 4 (3-3) Prereq Bio S 104 or Bot 201. The morphology and phylogeny of the algae, fungi, bryophytes and vascular plants. (a/y)

421 General Mycology 3 (2-3) Same as PI P 421. (a/y)


430 Principles of Plant Systematics 3 Prereq Bio S 104; 8 hrs biological science. Systematics of vascular plants: description, evolution, classification, nomenclature and current theory. Credit not granted for both Bot 430 and 530.

436 Agrobiology 3 (1-6) Prereq Bot 232.
Grasses and grasslike plants; economic importance of those in the West.

448 Evolutionary Ecology of Populations 3 Same as Zool 448. Credit not granted for both Bot 448 and 548.

450 Cell Biology 3 Same as GenCB 450.

460 Ecophysiology 3 Prereq Bot 320; Bio S 372. Relationships of biotic and abiotic environment to plant distribution and evolution through study of physiological processes. Credit not granted for both Bot 460 and 560.


499 Special Problems V 1-4 May be repeated for credit.

500 Seminar 1 May be repeated for credit. Prereq 20 hrs Bot.


505 Plant Physiology—Photosynthesis 1 Prereq Bot 320; BC/BP 364. Photosynthesis, photorespiration and the interrelationship of those biochemical, physiological, and environmental factors which determine plant productivity.

516 Experimental Methods in Plant Physiology 3 (1-6) Prereq Bot 320. Advanced techniques and instrumental methods applicable to research in plant physiology. (a/y)

524 Lower Fungi 2 (1-3) Same as Pl P 524. (a/y)

530 Principles of Plant Systematics 3 Graduate level counterpart of Bot 450; additional requirements. Credit not granted for both Bot 430 and 530.

533 Modern Methods in Systematics 4 (2-6) Prereq Bot 430 or Zool 511. Selecting, gathering, and analyzing morphological, cytological, chemical data for taxonomic and evolutionary studies.

548 Evolutionary Ecology of Populations 3 Same as Zool 548. Graduate level counterpart of Bot 468; additional requirements. Credit not granted for both Bot 448 and 548.

551 Plant Anatomy 4 (2-6) Prereq Bot 201. Developmental anatomy and morphology of vascular plants; economic forms.

552 Bryology 2 (1-3) Prereq Bot 201, 411. Systematics, evolution, and natural history of mosses and liverworts worldwide; history, literature, methods; field and laboratory experience. (a/y)

553 Biology of Lichens 2 (1-3) Prereq Bio S 104; Bot 201. Morphology, taxonomy, and ecology of lichens with emphasis upon identification. Cooperative course taught at the University of Idaho. (a/y)

556 Phycology 4 (3-5) Prereq Bact 201 or Bot 201. Biology of the algae; systematics, morphology, physiology, cytology, and ecology of algae with emphasis on freshwater forms. (a/y)

560 Ecophysiology 3 Graduate level counterpart of Bot 460; additional requirements. Credit not granted for both Bot 460 and 560.

562 Synecology 3 Graduate level counterpart of Bot 462; additional requirements. Credit not granted for both Bot 462 and 562.

563 Field Ecology 2 (0-6) Graduate level counterpart of Bot 463; additional requirements. Credit not granted for both Bot 463 and 563.

564 Plant Geography 3 Prereq Bot 332, 460.
or 462. Origin and distribution of major units of terrestrial vegetation; emphasis on North American. (a/y)

576 Palynology 4 (3-3) Same as Anth 576.

590 Advanced Topics in Botany 2-4 May be repeated for credit. Recent research in plant science.

592 Advanced Topics in Cell Biology 1-3 May be repeated for credit; cumulative maximum 7 hours. Same as GenCB 592.

600 Special Projects or Independent Study

Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Preparation for Graduate Study

Before undertaking graduate study, a student should have completed substantially the equivalent of the schedule of studies shown under the General Biology Program for the Botany option.

Undergraduate majors in such subjects as the applied plant sciences, the biological sciences, and the physical sciences may be well prepared for graduate study in this department. Students having deficiencies are given adequate opportunity to fulfill departmental requirements. Applicants should submit scores of the general aptitude and the advanced test in biology of the Graduate Record Examination.

Departments of Business

DEPARTMENT OF ACCOUNTING AND BUSINESS LAW


DEPARTMENT OF BUSINESS ADMINISTRATION


DEPARTMENT OF MANAGEMENT AND ADMINISTRATIVE SYSTEMS

Professor and Department Head, C. Morgan; Professors, L. Johnson, H. Lan; Associate Professors, V. Aggarwal, A. Chakravarty, M. Hammer, M. Wang; Assistant Professors, D. Baker, R. DeFilippi, G. Martin.

The study of business administration involves the understanding and application of knowledge developed in fields of accounting, information systems, finance and banking, human resources/personnel, management, marketing, quantitative methods, real estate, and transportation. Concepts from mathematics, sociology, psychology, anthropology, economics, and other disciplines are integrated in order to provide the individual with both a practical and theoretical understanding of business organization and its functions in our society. The broad education offered by this curriculum permits the student an almost unlimited range of employment opportunities in business, industry, and government.

The curricula leading to degrees in business administration at both the undergraduate and graduate levels are accredited by the American Assembly of Collegiate Schools of Business.

The business departments offer courses of study leading to the degrees of Bachelor of Arts in Business Administration, Master of Accounting, and Master of Business Administration.

Description of Courses

For explanation see Index under "Symbols"

Accounting

Acctg

230 Principles of Accounting I 3 Freshmen permitted if specializing in accounting. The structure and interpretation of accounts and financial statements.

231 Principles of Accounting II 3 Prereq Acctg 230. Introduction to managerial accounting; generation and use of accounting data for planning and controlling business operations.

330 Intermediate Accounting I 3 Prereq Acctg 231. Theory underlying the determination of income; analysis of financial statements.

338 Cost Accounting 3 Prereq Acctg 231. Management uses of cost information; cost systems and system design; cost analysis.
430 Advanced Accounting 3 Prereq Acctg 331. Partnership equities and extended forms of corporate ownerships and entities.
431 Accounting Theory 3 Prereq Acctg 331. Accounting theory and contemporary issues.
433 Accounting Systems 3 Prereq Acctg 330, 338; Cpt S 150 and 152 or 153. Accounting systems design; internal control and computerization.
434 Accounting for Public Organizations 3 Prereq Acctg 331. Conceptual and procedural accounting issues involving public sector organizations.
438 Advanced Cost/Managerial Accounting 3 Prereq Acctg 330, 338; Cpt S 150 and 152 or 153. Information and reporting needs of contemporary management for planning and control of operations.
439 Auditing 3 Prereq Acctg 331, 338, 433; Cpt S 150 and 152 or 153. Nature of auditing, generally accepted auditing standards, and audit procedures as related to auditing of financial statements by independent accountants.
498 Internship in Business V 1-15 By interview only. Internship with a business organization in professional and managerial activities.
499 Special Problems V 1-4 May be repeated for credit.
530 Accounting Theory 3 Recent developments with respect to the determination of income and the valuation of assets.
532 Contemporary Accounting Cases and Problems 3 Accounting theory applied to external financial reporting practices.
533 Administrative Control 3 Managerial evaluation of budgeting, cost accounting, and financial analysis techniques; their utilization in control of operations.
534 Survey of Accounting 4 Fundamentals of financial and managerial accounting; primarily for graduate students who wish to meet the MBA core requirements in accounting.
535 Tax Planning and Research 3 Prereq Acctg 335. Research on and formulation of federal tax plans for individuals and businesses.
538 Seminar in Cost/Managerial Accounting 3 Cost concepts, cost and managerial accounting systems; current issues and research in cost and managerial accounting.
539 Seminar in Public Accounting and Auditing 3 Prereq Acctg 439. Public accounting and auditing to present; emphasis on current issues including statistical sampling and computers.
596 Seminar 3 May be repeated for credit.
600 Special Projects or Independent Study Variable credit.
702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

Business Law

B Law
210 Law and Business I 3 Not open to freshmen. Fundamentals of business law; the legal system, legal reasoning and the law of contracts, torts, and agency.
410 Law and Business II 3 Prereq B Law 210. Legal aspects of government regulation of business; administrative law, antitrust law, and labor law.
414 Law of Real Estate 3 Prereq B Law 210. Legal principles and precedents as they apply to the real estate environment.
499 Special Problems V 1-4 May be repeated for credit.
510 Law for the Business Manager 3 Contract, tort, constitutional and administrative law; impact of government regulation on business. Credit not granted for both B Law 410 and 510.

Finance
Fin
325 Finance 3 Prereq QMeth 215 or c/; Acctg 231 or c/; Econ 201 or 203. Financial decision making, financial strategies, investment in current and fixed assets, financial instruments, and capital markets.
424 Commercial Bank Management 3 Prereq Fin 429. Problems facing bank managers and solution techniques; asset and liability management; loan pricing; banking structure; bank regulation.


426 Cases in Financial Management 3 Prereq Fin 325. Selected cases in finance; current and long-term financing; expansion; problems of small business.

427 Investments and Security Analysis 3 Prereq Fin 325. Investment objectives, security markets, market efficiency, and principles of security valuation.


429 Financial Institutions and Markets 3 Prereq Fin 325; Econ 320. Level and term structure of interest rates; characteristics of financial institutions and markets; financial futures.

496 Seminar 3 May be repeated for credit.

498 Internship in Business V 1-15 By interview only. Internship with a business organization in professional and managerial activities.

499 Special Problems V 1-4 May be repeated for credit.

502 Financial Management 3 Prereq Acctg 534; Econ 201 or 203. Financial management of the firm; capital budgeting, working capital management, capital acquisition, and dividend policy.

521 Interest Rates and Financial Markets 3 Prereq Fin 325. Real and nominal interest rates; bond pricing; term and risk structure of interest rates; investment and commercial banking; financial futures.


526 Problems in Financial Management 3 Prereq Fin 502. Application of financial principles to problems in financial management; credit policy, capital budgeting, leasing and mergers, cash management.

527 Investment Analysis 3 A decision-making approach to the problems of asset management for personal and business portfolio.

596 Seminar 3 May be repeated for credit.

600 Special Projects or Independent Study Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

Insurance

320 Risk and Insurance 3 Prereq B Law 210; Econ 102 or 201. Types of risk and methods of protection; life, property, and liability insurance.


421 Life and Health Insurance 3 Prereq Ins 320. Management of the life, health, and disability insurance risks facing the individual and society; private and public solutions.

498 Internship in Business V 1-15 By interview only. Internship with a business organization in professional and managerial activities.

499 Special Problems V 1-4 May be repeated for credit.

600 Special Projects or Independent Study Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

Management

Mgt

201 Introduction to Business Administration 3 Not open to freshmen. For non-majors. Management, marketing, production, finance, law, work behavior, organization theory.

301 Principles of Management and Organization 3 Principles of management and administration aimed at improving effectiveness of all types of organizations.

340 Operations Management 3 Prereq QMeth 215. The management of operations in business organizations; planning and control of work-flow; resource allocation, and utilization.

401 Organizational Behavior 3 Prereq Mgt 301. Organizational behavior, motivation, leadership, communications, deci-
sion-making, group dynamics.

440 Advanced Operations Management 3 Prereq Mgt 340. Advanced concepts of production and operations management; development of analytical skills in identifying and solving production and operations management problems.

448 Introduction to Management Information Systems 3 Prereq Cpt S 150 and one of 151, 152, 153, 154; Mgt 301. Systems design principles, computer capabilities, and information management theory that contribute to the requirements of decision-makers.

450 Personnel and Human Resources Management 3 Prereq QMeth 215; Mgt 301. Policy and practice in human resource utilization, selection, training, motivating, evaluating, and compensating employees; labor relations; EEO legislation.

452 International Business 3 Prereq Mgt 301. Theory of foreign direct investment, management of multinational corporations, and host country analysis.

453 Comparative International Management 3 Comparison of management systems of selected countries.

472 Systems Analysis and Design 3 (2-3) Prereq Cpt S 370; COBOL programming. The application of systems analysis to the design and development of business and management systems.

491 Business Strategy and Policy 3 Prereq completion of all other core courses. Overall management of the firm; top level decision-making and planning.

492 Small Business Policy 3 Prereq completion of all other core courses. Application of management theory and principles to small firms; applied consulting experience with operating businesses. By interview only.

496 Seminar 3 May be repeated for credit.

498 Internship in Business V 1-15 By Interview only. Internship with a business organization in professional and managerial activities.

499 Special Problems V 1-4 May be repeated for credit.

501 Management of Organizations 3 Leading, organizing, decision-making, planning, controlling, conflict management, and behavior in work organizations.

507 Computers and Systems for Managers 3 Data base concepts, management information systems, design of application programs, and computer concepts.

580 Information Systems Management 3 Prereq Mgt 501. Data processing organization; operations, application development, computer selection, management of computer personnel and systems.

581 Operations Management 3 Prereq Math 202; QMeth 215; Mgt 340. An analytical approach to solving problems in production and operations management.

582 Personnel and Human Resource Management 3 Prereq Mgt 501. Human resources and personnel administration; selection, training, compensation, performance appraisal, labor relations, health and safety, EEO legislation.

583 Organization Design 3 Prereq Mgt 501. Development and design of contemporary systems of organization and management.

584 Organizational Behavior 3 Prereq Mgt 501. Theory and models of organizational behavior; individual, interpersonal, and group dynamics; influence, motivation, communication, change; organization climate.

591 Business Strategy and Policy 3 Overall management of the firm; top-level decision-making and planning.

596 Seminar 3 May be repeated for credit.

600 Special Projects or Independent Study Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

Marketing

Mktg

360 Marketing 3 Functions, methods, and middlemen used in marketing the principal types of goods; price policies, cost of marketing; government regulation.

367 Consumer Behavior 3 Prereq Mktg 360. The investigation of social-psychological phenomena affecting consumer decision processes; learning theory and communication.

460 Marketing Management 3 Prereq Mktg 360. Use of the case method in the analysis of marketing policies; organization and control of marketing models activities.

462 Marketing Models and Analysis 3 Prereq Cpt S 150 and one of 151, 152, 153, 154; Math 201; QMeth 215; Mktg 360. The theory and evaluation of marketing models and their significance to the analysis of marketing problems.
467 Marketing Research 3 Prereq QMeth 215; Mktg 360. Survey and experimental methods as they relate to marketing research.

470 Retailing Management 3 Prereq Mktg 360. Retailing system; organization, merchandising models, pricing, promotion, location, and control procedures; management decision processes.

477 Promotion Management 3 Prereq Mktg 360. Text and case approach to integrating promotion into the marketing plan; methods, organization, communications, media selection, and campaigns.

498 Internship in Business V 1-15 By interview only. Internship with a business organization in professional and managerial activities.

499 Special Problems V 1-4 May be repeated for credit.

505 Survey of Marketing 3 Marketing management; relevance of marketing to company profitability and consumer satisfaction; decision regarding price, product, promotion, and distribution.

506 Marketing Management and Administrative Policy 3 Marketing management and administrative policies as they relate to concepts, strategies, and decision making.

560 Research Methodology 3 Prereq QMeth 215. Types of data needed and available, collection and analysis of data as they relate to decisional research.

565 Seminar in Marketing—Behavior/Economic Aspects 3 Marketing structure and behavior from economic and behavioral perspectives; social evaluation and behavioral implications of marketing strategy.

567 Consumer Behavior Theory 3 Prereq Mktg 305. Theory in consumer and buyer behavior; conceptual and empirical research role of purchase and consumption behavior on society and marketing.

568 Social Issues in Marketing 3 Prereq Mktg 305. Productivity and efficiency in marketing; public policies and marketing structure and performance; marketing policies and consumer welfare.

600 Special Projects or Independent Study Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

Quantitative Methods

QMeth

215 Statistics 4 (3-3) Prereq Math 202 or c/. Data presentation, probability, distributions, hypothesis testing, estimation, time series, and simple linear regression as applied to business.

344 Principles of Optimization 3 Same as Math 364.

412 Statistical Methods for Management 3 Prereq QMeth 215; Math 202 or 171. Chi-square, analysis of variance, and nonparametric statistics as applied to business.

417 Introduction to Simulation 3 Prereq introductory statistics and FORTRAN programming. Model formulation, simulation, simulation languages, and analysis of results with selected application.

444 Decision Analysis 3 (2-3) Prereq QMeth 215. Introduction to Bayesian analysis, decision theory, utility, subjective probability and multiperson decision theory as applied to business.

498 Internship in Business V 1-15 By interview only. Internship with a business organization in professional and managerial activities.

499 Special Problems V 1-4 May be repeated for credit.

514 Techniques of Sampling 3 Prereq QMeth 215. Sample surveys for business use; theory and application with emphasis on appropriate sample types and the estimation of their parameters.

515 Quantitative Methods I 3 Prereq QMeth 215. Review of elementary statistics, regression, sampling, experimental design, analysis of variance, chi-square, and nonparametric techniques applied to business.

516 Time Series 3 Prereq QMeth 215. Seasonal, cyclical, and trend analysis, index numbers, autoregressive, moving average and mixed models, model identification and forecasting.

519 Applied Multivariate Analysis 3 Prereq QMeth 215, Biom 430, or Stat 443. Multivariate normal distribution, estimation, hypothesis testing, discriminant analysis, canonical correlation, principal components, factor analysis.
Quantitative Methods II 3 Prereq QMeth 215. Decision analysis, linear optimization models, nonlinear models, network analysis including PERT, and dynamics programming as applied to business.


Special Projects or Independent Study Variable credit.

Master's Special Problems, Directed Study, and/or Examination Variable credit.

Real Estate

Real Estate 3 Prereq B Law 210; Econ 102 or 201. Relationships between location and value; patterns of urban land use; legal, financial, and organizational framework of the real estate business.

Valuation and Location Theory 3 Prereq R E 305. Principles and practices of real property valuation; factors affecting real property values and income; appraisal and location theory.

Real Estate Administration 3 Prereq R E 305. The case method of analyzing management policies, practices, and decision making in real estate firms.

Real Estate Finance 3 Prereq Fin 305. Instruments, techniques, and institutions of real estate finance with emphasis upon the financial decision-making process.

Internship in Business V 1-15 By interview only. Internship with a business organization in professional and managerial activities.

Special Problems V 1-4 May be repeated for credit.

Advanced Topics in Real Estate 1 Basic forces that motivate and affect investors in their use and possession of real estate.

Special Projects or Independent Study Variable credit.

Master's Special Problems, Directed Study, and/or Examination Variable credit.

Certification Requirements

To be eligible to certify as a business administration major, a student must have earned at least 40 semester hours of credit on graded course work, including 6 hours of business core courses, and meet current standards of (1) cumulative g.p.a., and (2) g.p.a. based on at least 15 hours of business core courses. Full details are available from the department; current standards are also published each fall in the Catalog Supplement.

General Departmental Requirements

General course requirements, core courses, and fields of specialization (options) are presented below. Requirements may vary depending upon the field of specialization selected. For more detailed information, students should contact the College of Business and Economics.

General courses include General University Requirements (GURs) and departmental requirements. Three-fourths (21 hours) of the GURs should be completed by the end of the sophomore year. In addition, all students must complete the core courses and a field specialization, selected during the junior year. The student's senior year (last 30 hours) must be taken in residence on the WSU campus.

Schedule of Studies

**General Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Engl 201 or 301</td>
<td>3</td>
</tr>
<tr>
<td>Math 201 Intro Finite Math</td>
<td>3</td>
</tr>
<tr>
<td>Math 202 Intro Math Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Cpt S 150 and one of 151, 152, 153, 154</td>
<td>4</td>
</tr>
<tr>
<td>Sciences (10 hours if Math 201 not included)</td>
<td>7</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>3</td>
</tr>
<tr>
<td>Pol S or Hist</td>
<td>3</td>
</tr>
<tr>
<td>Psych 102 or Soc 101 or Anth 101</td>
<td>3</td>
</tr>
<tr>
<td>Humanities</td>
<td>6</td>
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<tr>
<td>Electives</td>
<td>13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>48</strong></td>
</tr>
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</table>

**Core Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>B Law 210 Law and Business</td>
<td>3</td>
</tr>
<tr>
<td>QMeth 215 Statistics</td>
<td>4</td>
</tr>
<tr>
<td>Acctg 230 Accounting I</td>
<td>3</td>
</tr>
<tr>
<td>Acctg 231 Accounting II</td>
<td>3</td>
</tr>
<tr>
<td>Econ 102 Macroeconomics</td>
<td>3</td>
</tr>
<tr>
<td>Econ 203 Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>Mgr 301 Management &amp; Organization</td>
<td>3</td>
</tr>
<tr>
<td>Fin 325 Finance</td>
<td>3</td>
</tr>
<tr>
<td>Mgr 340 Operations Management</td>
<td>3</td>
</tr>
<tr>
<td>Mktg 360 Marketing</td>
<td>3</td>
</tr>
</tbody>
</table>

113
Departments of Business

Econ 301 Firm & Market Policy 3
Mgt 491 or 492 3
Total 37

1Excluding courses in physical education, business administration, hotel and restaurant administration, and economics.

Fields of Specialization

DEPARTMENT OF ACCOUNTING & BUSINESS LAW

Accounting
The objective of the baccalaureate program with a concentration in accounting is to provide basic conceptual accounting and business knowledge as a foundation for accounting career development. This would provide preparation for careers in public accounting, corporation accounting, and for accounting positions in government service.

Junior and senior years: Acctg 330, 331, 335, 338, 410 or 411 (recommended for CPA), 433, and 439; one of Acctg 430, 431, 434, 435 or 438; Econ 320 or 340; one of Fin 425, 426, Mgt 440, 450, or Mkrg 460.

DEPARTMENT OF BUSINESS ADMINISTRATION

Finance
Preparation for careers in financial department of business, commercial and investment banks, governmental financial agencies, and other financial institutions.

Junior and senior years: Fin 325, Acctg 330, 331, Fin 425, 426, Econ 320, and two electives from: R E 305, QMeth 412, Ins 420, 421, Fin 424, 427, 429; two additional electives from accounting, economics, finance or any combination.

Insurance
Preparation for careers in insurance agency, actuarial science, claims, corporate risk management, investment, and underwriting.

Junior and senior years: Ins 320, 420, 421, Mkrg 460; one of Acctg 330, 335, 338; two of Mktg 340, 401, 440, 448, 450; one of B Law 410, 411, 414.

Marketing
Preparation for careers in marketing management, manufacturers’ and wholesalers’ sales, retailing, and marketing research.

Junior and senior years: Mkrg 367, 460, 462 or 463, 467, 477; one of Acctg 338, QMeth 444, Mkrg 462, 463, 470; one of Econ 312, 320, 364, 445, 460, 470.

Quantitative Methods
Preparation for careers in business and government research.

Junior and senior years: QMeth 344, 412, 417, 444; one of Fin 426, Mgt 440, or Mkrg 460; two of Acctg 338, Mktg 448, Mkrg 462, Cpt S 330, 370, Math 464, Stat 429, Econ 410, 411 or course approved by QMeth area.

Real Estate
Preparation for careers in real estate administration, appraisal, brokerage, finance, management, marketing, production, selling, and title insurance.

Junior and senior years: R E 305, 405, 406, 407, B Law 414, Mkrg 460, and Econ 316; two of Ins 320, Acctg 335, Mgt 340, Mkrg 367, B Law 411, Fin 426, 428, Econ 312, 340, Arch 331, 342, Env S 444.

Transportation
Preparation for careers with air, highway, pipeline, railroad, and water carriers, with traffic departments of agricultural and industrial concerns, chambers of commerce, research organizations, and with government agencies dealing with transportation problems.

Junior and senior years: Econ 320, 364, 463, 464; one of Fin 426, Mgt 440, Mkrg 460; two of Acctg 338, Mkrg 463, Econ 340, 350, 460, 470.

HOTEL AND RESTAURANT ADMINISTRATION
(see alphabetical listing)

DEPARTMENT OF MANAGEMENT & ADMINISTRATIVE SYSTEMS

Information Systems
Preparation in computer programming and for careers in analysis and design of information systems in organizations where computers are an integral management tool.

Junior and senior years: Cpt S 152, 370; Mkrg 448, 472; one of QMeth 344, 417; four of Cpt S 250, 260, 350, Acctg 330, 338, 433, Mkrg 401, 440, 450, QMeth 412, 417 or 344 (opposite of choice above), 444.

General Business
Preparation for careers in business for the student who does not wish to specialize in any of the other options. Students looking forward to being proprietors of their own business frequently desire a general business course.
Junior and senior years: Acctg 338; two 400-level business electives; one 300-400-level business elective; one 300-400-level business or Econ elective; one of Fin 426, Mgt 440, 450, or Mkgt 460.

Human Resources/Personnel
Preparation for careers in personnel and industrial relations and the personnel aspects of government service and business.

Junior and senior years: Mgt 401, 450, Econ 350, 450, Psych 412; three of QMeth 412, Mgt 440, 448, Econ 451.

Management
Students may emphasize preparation for one of three careers in this option: (1) careers as production executives in manufacturing and enterprises and for other administrative positions in business and government for which production training is useful and desirable; (2) careers for which an understanding of international business is desirable; and (3) careers in management which require an understanding of people in organizations as well as the production function.

Junior and senior years: three of Mgt 401, 440, 448, 450, 452; five of Acctg 338, QMeth 344, 412, 444, Econ 350, 450, 400-level business elective and two 400-level management electives.

Second Bachelor's Degree
Students who have received a bachelor's degree in another area may obtain a Bachelor of Arts degree in Business Administration by presenting total credits of at least 150 hours and by fulfilling the following departmental requirements: B Law 210, QMeth 215, Acctg 230, 231, Mgt 301, Fin 325, Mgt 340, Mkgt 360, Mgt 491 or 492, and one additional 400-level course in business; Econ 102, 203, and 301; Cpt S 150 and one of Cpt S 151, 152, 153, 154; Math 201, 202. If the lower-division courses required for this second degree can be taken as electives during the regular undergraduate degree program, the requirements for the second degree can be completed in one year. Otherwise, three semesters will be required for the second degree.

Transfer Students
Students planning to transfer to Washington State University at the end of the freshman or sophomore year should follow as closely as possible the general and core course requirements set forth above. If this is done, there should be no difficulty in completing the requirements for the bachelor's degree within the normal period of four years. It should also be noted that courses taken at community colleges which are numbered at the 300-level or above at WSU will not be accepted toward meeting major requirements.

Preparation for Graduate Study
The objective of the Master of Accounting program is to provide candidates with greater breadth and depth in accounting education than is possible in baccalaureate or masters in business administration programs in preparation for careers as professional accountants in financial institutions, government, industry, nonprofit organizations, and public practice.

Programs of study leading to the Master of Business Administration degree may be taken in several fields with limited specialization; accounting, finance, management, marketing, and quantitative methods. If the following courses are not completed prior to entering the graduate program, the following courses may be taken after entering the program but will be considered deficiency courses and not part of the regular degree program: B Law 210, QMeth 215, Acctg 230, 231, Mgt 301, Fin 325, Mgt 340, Mkgt 360; Econ 201 or 102, Econ 205, 301; Cpt S 150 and one of 151, 152, 153, 154; Math 201 and 202.

Department of Chemical Engineering


The curriculum in chemical engineering provides thorough knowledge of basic science and engineering. This includes material and energy balances, chemical and physical equilibria, rate processes, and economic balances. With such training, graduates may participate in the design of large-scale equipment for chemical manufacturing plants or they may engage in research leading to new or improved chemical processes, products, and uses. Graduates may also find rewarding work in plant operation,
plant management, university teaching, sales-service, and other functions requiring chemical engineering training. A major effort of the department is in air pollution academic training and research. The curriculum in chemical engineering in the College of Engineering is accredited by the Engineers Council for Professional Development.

The total number of majors in the department is restricted at the junior level.

The department offers courses of study leading to the degrees of Bachelor of Science in Chemical Engineering and Master of Science in Chemical Engineering. The department participates in the interdepartmental program in engineering science leading to the degree of Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Ch E

101 (110) Engineering Orientation 1 (0-3)
Engineering as a profession; career opportunities; general orientation for freshman engineers.

174 (Z) Introduction to Meteorology and The Atmospheric Environment 3 Introduction to meteorology, the atmospheric processes; weather, air pollution, and environmental topics.

201 (221) Chemical Process Principles and Calculations 4 Prereq Chem 106 or 212; Math 172. Fundamental concepts of chemical engineering; problem-solving techniques and applications in stoichiometry, material and energy balances, and phase equilibria.

301 (407) Chemical Engineering Thermodynamics 3 Prereq Ch E 201; Chem 331; major in Ch E. Definitions, basic concepts and laws; property relationships; construction of thermodynamic charts and tables; compression and liquefaction of gases; power cycles; refrigeration.

330 (430) Unit Operations I 4 Prereq Ch E 201; major in Ch E. Design calculations, operations, and evaluation of equipment used in fluid flow, heat transfer, and evaporation.

331 (431) Unit Operations II 4 Prereq Ch E 330; major in Ch E. Design calculations, operation, and evaluation of equipment used in distillation, extraction, absorption, adsorption, drying, humidification, filtration, and other unit operations.

406 Industrial Chemical Processes 3 Prereq Chem 342 or c/; Ch E 331. The chemistry, chemical engineering, and economics involved in modern chemical process industries.

411 (304) Chemical Process Simulation 3 Prereq Math 315; Ch E 301, 331; major in Ch E; Ch E 421 or c/.. Simulation of chemical and other processes using digital devices.

421 (412) Kinetics and Reactor Design 3 Prereq major in Ch E; Chem 331; Math 315. Chemical reaction kinetics applied to the design of reactors, non-ideal flow, mixing, catalysis.

433 Chemical Engineering Laboratory 2 (0-6) May be repeated for credit; cumulative maximum 4 hours. Prereq Ch E 331, 421 or c/; major in Ch E. Laboratory experiments in heat and mass transfer; separations, other unit operations, kinetics, control; design calculations and report writing.

441 (409) Process Control 3 Prereq Ch E 411; major in Ch E. Measuring instruments, automatic control, process and instrument characteristics and theory applied to industrial control problems.

451 (423) Process Development, Design, and Evaluation 4 Prereq Ch E 301, 331; major in Ch E. Development, design, and economic evaluation of chemical and related processes as practiced in industry.

461 (414) Introduction to Nuclear Engineering 3 Prereq junior in Engr or Ph S. Nuclear physics and radiation calculations; conceptual design of a nuclear reactor core and shielding using basic formulations of nuclear engineering.


470 Fundamentals of Air Pollution 3 Prereq Chem 102. Source, magnitude, and impact; chemistry of urban atmospheres, photochemistry of smog, and meteorological factors.

474 Meteorology 2 Prereq Phys 101 or 201. Meteorology and atmospheric science applied to problems in physical environmental, agricultural, and engineer-
ing sciences; weather modification, climate change, energy problems.

**495 Chemical Engineering Internship 2** May be repeated for credit; cumulative maximum 4 hours. Students to work full time in engineering assignments in approved industries with prior approval of adviser and industrial supervisor.

**498 Technical Seminar 1** May be repeated for credit; cumulative maximum 2 hours. For juniors and seniors in Ch E.

**499 Special Problems V 1-4** May be repeated for credit.

**508 Air Pollution Control Engineering 3** Prereq senior in Engr or Ph S. Measurement and control of air pollution; engineering design calculations; equipment and process.

**510 Transport Processes 3** or 4 Transport of mass, energy, and momentum; unsteady and steady states as applied to chemical processing; macroscopic and microscopic analyses. Joint listing with the University of Idaho.

**515 Convective Heat Transfer 3** Same as M E 515.

**521 Special Topics in Air Pollution V 1-3** May be repeated for credit; cumulative maximum 6 hours. Advanced topics in the area of industrial and urban air pollution problems and air pollution control engineering.

**522 Viscous Fluid Flow V 2-3** Same as M E 522.

**523 Basic Concepts in Catalysis 2** Preparation and characterization of supported heterogeneous catalysts, mechanistic interpretation of surface reactions and chemisorption, deactivation, and kinetics from lab experiments.

**525 Polymer Reactor Engineering 3** Prereq Ch E 412. Reaction engineering applied to polymerization reactions; effects on polymerization rate, molecular weight, and copolymer composition.

**527 Advanced Chemical Engineering Thermodynamics 2-3** Equilibria in physical and chemical systems; generalized prediction of thermodynamic properties, nonideal systems. Joint listing with the University of Idaho.

**529 Chemical Engineering Kinetics 2-3** Interpretation of kinetic data and design of nonideal chemical reactors; fundamentals of heterogeneous catalysis, catalyst preparation, characterization, and theory. Joint listing with the University of Idaho.

**532 Transport and Reactions in Multiphase Processing 3** Prereq Ch E 331. Momentum, heat, mass transfer, and reactions in multiphase processing as relevant to chemical, polymer, environmental, and biotechnology processes. (a/y)

**541 Chemical Engineering Analysis I 2-3** Mathematical analysis of chemical engineering operations and processes; mathematical modeling and computer applications. Joint listing with the University of Idaho.

**545 (505) Mass Transfer Operation I 2-3** Diffusional and equilibrium operations. Joint listing with the University of Idaho.

**546 Mass Transfer Operations II 2-3** Diffusional and equilibrium operations. Joint listing with the University of Idaho.

**551 Discrete Digital Control 3** (2-3) Prereq Ch E 441. Design and implementation of digital control algorithms; Z-transforms; state space methods.

**557 Advanced Plant Design 2-3** Design of process plants for optimum cost and economic return; scale-up of pilot plants. Cooperative course taught at the University of Idaho.

**560 Biochemical Engineering 2-3** Applications of chemical engineering to biological systems; fermentation processes, biochemical reactor design, transport phenomena in biological systems, biochemical technology. Cooperative course taught at the University of Idaho.

**571 Air Pollution Meteorology 3** Prereq Math 313; Phys 102 or 202; Ch E 474. Weather and climate; atmospheric turbulence; transport and diffusion related to air pollution problems by modeling, statistical and graphic treatment.

**572 Air Pollution Measurement Techniques 2** (1-3) Prereq Chem 217 or 221; Phys 102. Survey design and site selection; identification and determination of air pollutants by chemical and physical methodology; data reduction and presentation.

**573 Air Pollution Abatement and Administration 2** Air quality management, criteria, and standards; administration of air pollution control agencies; enforcement, inspection, and surveillance.

**574 Air Pollution Seminar 1** May be repeated for credit; cumulative maximum 2 hours. Recent advances in air pollution research.
581 Advanced Topics in Chemical Engineering I V 1-3 Filtration, reaction engineering, two-phase flow, non-Newtonian fluids, interfacial phenomena, nuclear design, fluidization, thermodynamics.

598 Research Seminar 1 May be repeated for credit. Seminar presentations on current topics in Ch E research.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit. (for PhD in engineering science only)

Schedule of Studies

The Bachelor of Science degree in Chemical Engineering requires a total of 128 semester hours. At least 61 of the total hours required for this degree must be in upper-division courses.

Freshman Year

First Semester
- Math 171 Calculus I 4
- Chem 105 Principles 4
- Engl 101 Composition 3
- Hum Elective* 3

Second Semester
- Math 172 Calculus II 4
- Math 220 Int Lin Alg 2
- Chem 106 Principles 3
- Chem 107 Qual Analysis 2
- Phys 201 Class Phys 4
- Soc S Elective* 3

Sophomore Year

First Semester
- Cpt S 203 Cpt Prog Eng 4
- Chem 221 or 2171 4
- Phys 202 Class Phys 4
- Math 273 Calculus III 2
- Math 315 Diff Eq 3

Second Semester
- Ch E 201 Ch Proc Prin 4
- C E 213 Stat & Strg Matl 4
- Engl 201 Expo Writing 3
- Bio S Elective* 3
- Hum Elective* 3

Junior Year

First Semester
- Ch E 330 Unit Oper I 4
- Chem 340 Organic 3
- Chem 341 Org. Chem Lab 2
- Chem 331 Phys Chem 3
- Chem 333 Phys Chem Lab 1
- Econ 201 Contem Econ 4

Second Semester
- Ch E 501 Ch E Thermo 3
- Ch E 531 Unit Oper II 4
- Chem 342 Organic 3
- E E 301 El Eng Fund 3
- E E 302 E E Fund Lab 1
- Adv Hum or Soc S Elective* 3

Senior Year

First Semester
- Ch E 411 Proc Simuln 3
- Ch E 421 Kinetics 3
- Ch E 433 Ch E Lab 3
- Ch E 498 Tech Seminar 1
- Ch E Elective* 4
- Technical Elective* 5

Second Semester
- Ch E 433 Ch E Lab 3
- Ch E 441 Proc Control 3
- Ch E 451 Design 4
- Ch E 498 Tech Seminar 1
- Ch E Elective* 3
- Technical Elective* 3

1Well qualified students are encouraged to take Chem 111, 212 in place of Chem 105, 106, 221 (217).

2Must be an upper-division course continuing some prior field of study.

3Ch E 433 must be taken for two semesters. It should be taken during the senior year.

4Select from approved list of courses on file in departmental office.

5A technical subject approved by the department chair before enrollment.

*Pass-fail enrollment limited to these courses unless they are GURs.

Transfer Students

Students who are planning to transfer to Chemical Engineering at Washington State University from other institutions should coordinate their programs with the department chair to establish a schedule of studies leading to the bachelor's degree. This is desirable because of sophomore professional requirements and course sequences. A strong prepara-
tion in chemistry, mathematics, and physics is necessary prior to transfer to minimize the time required at Washington State University to complete bachelor’s degree requirements. Inquiries concerning specific questions are welcomed. Since there is a restriction on the total number of majors in the department, transfer students should make application for admission as soon as possible.

**Preparation for Graduate Study**

As preparation for work toward an advanced degree, a student should have completed substantially the equivalent of the above schedule of studies. A Bachelor of Science degree in Chemical Engineering from an institution accredited by ECPD normally will satisfy this requirement.

Special programs are also available for students with bachelor’s degrees in chemistry or other areas of science who wish to obtain the Master of Science degree in Engineering with a concentration of course work in chemical engineering including many air pollution courses.

**Certification**

Students who have completed the requirements for certification as a Chemical Engineering major must apply to the department requesting certification. Specific requirements can be obtained from the departmental office although eligibility usually occurs at the end of the sophomore year. Criteria for certification include overall g.p.a., grades earned in mathematics and physical science courses and performance in the CH E 201 course. A certified student earning a g.p.a. of less than 2.0 for two consecutive semesters or with more than two repeats in CH E courses will be decertified.

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**Program in Chemical Physics**


Chemical physics is the interdisciplinary area which covers the extensive research and professional activity carried out in the overlapping regions of chemistry and physics. Included in chemical physics are topics such as theoretical and experimental studies of the electronic structure of atoms, ions, and molecules, their interactions with each other and with surfaces, study of the relationship of the equilibrium and dynamic properties of matter in bulk to the nature of its molecular constituents, and study of the absorption of energy by and transfer between molecules. Use is made of quantum theory and statistical mechanics in the theoretical studies. Typical experimental techniques are those of electron and x-ray spectroscopy; spectroscopic methods covering most of the range of the electromagnetic spectrum; magnetic susceptibilities, and molecular, ionic, and electron beams. Computers are often used in both the theoretical and experimental investigations.

The research interests of the current members of the chemical physics program encompass a broad spectrum of theoretical and experimental methods. There are investigations involving NMR and NQR, fast reactions, laser Raman spectroscopy, surface physics and chemistry, interactions in crystals, photophysics and photochemistry of excited states using pulsed and continuous lasers, molecular quantum mechanics, computation of physical properties of small molecules, x-ray crystallography, magnetic and optical properties of solids, investigations of surfaces, and electron tunneling spectroscopy.

The interdisciplinary nature of the program is stressed and allows students maximum flexibility to meet their needs and interests; however, all students are expected to complete courses in thermodynamics, statistical mechanics, quantum theory, group theory, and atomic and molecular structure.

Students may obtain a Bachelor of Science degree in Chemistry or Physics with a concentration in chemical physics. Upper-division students are given the opportunity to perform experiments with research apparatus through 499 projects. A student planning graduate study in chemical physics is advised to obtain a strong undergraduate preparation in physics, chemistry, and mathematics, although deficiencies in these areas may be rectified after graduate study has been undertaken.

The course of study leads to the degree of Doctor of Philosophy.

**Description of Courses**

For explanation see Index under "Symbols"

Ch P

461 Atomic and Molecular Physics 3 Same as Phys 461. Credit not granted for both Ch P 461 and 561.
Chemistry is the fundamental science that deals with the nature of substances and the changes occurring in them. Chemical reactions are the basis of all life on Earth. Everything we are or do depends in one way or another on chemistry. A major in chemistry or biochemistry prepares you for a variety of careers in industry, education, ecology, and public service, or for graduate study and research in chemistry and many related fields.

The department has excellent facilities and special equipment for graduate study and research. There are active research programs in analytical chemistry (neutron activation analysis, environmental trace metals, iron selective electrodes, electroanalytical chemistry); biochemistry (enzyme kinetics; fluorescence, ORD/CD, isotopic tracer and substrate analog studies of enzyme mechanisms; NMR studies of ion binding to biological compounds; metabolic pathways in microorganisms; biochemical control mechanisms; protein biosynthesis and regulation of plant growth; biophysical chemistry of macromolecules); inorganic chemistry (kinetic and isotopic studies of reaction mechanisms; stereochemistry of coordination compounds; synthetic chemistry; transition metal compounds with olefins and acetylenes; NMR studies of stereochemistry and the nature of metal-ligand bonds); bioinorganic chemistry; organic chemistry (boron-carbon compounds; mechanisms of molecular rearrangements; secondary deuterium isotope effects; metal isocyanide complexes; reaction kinetics and stereochemistry; ring-chain tautomerism; synthetic medicinal chemistry; novel synthetic reactions; alkyl-transition metal intermediates; and physical chemistry (theories of valence and chemical bonding; molecular and crystal structure by infrared, Raman, x-ray and neutron spectroscopy; nuclear magnetic and nuclear quadrupole resonance; photochemistry of dyes and studies of photosynthesis using picosecond laser pulses; EPR; study of fast reactions by NMR, tracer, and angular correlation techniques; magnetic susceptibility studies; colloid science; sedimentation potentials; molecular quantum mechanics, mechanisms of inter- and intramolecular energy transfer; molecular electronic spectroscopy of solutions and solids).

The department is on the approved list of the American Chemical Society.

The department offers courses of study leading to the degrees of Bachelor of Science in Biochemistry, Master of Science in Chemistry, and Doctor of Philosophy (Biochemistry, Chemistry).

The Department of Chemistry offers a pro-
gram leading to both a Bachelor of Science and Master of Science in Chemistry within a period of five years. Students wishing to enroll in the program must declare their intentions at the end of the junior year and begin research for the MS thesis while still an undergraduate.

The program is designed so that the BS degree will normally be awarded at the end of four years and the MS approximately 15 months later. In order to enter this program the student’s undergraduate record must show that the final transcript will satisfy the requirements for admission to the WSU Graduate School. Further information on this program can be obtained from the Department of Chemistry.

A student will begin the study of chemistry with Chem 104, 105 or 111, depending on preparation. (A new student must take the Placement Examination in chemistry prior to registration.) In order to take most courses in chemistry above the 100-level, the student must complete one of the following sequences: Chem 104, 105, and 106/107; 101, 105, and 106/107; 101, 102, and 106/107; 105, and 106/107; 111 and 212.

The Department of Chemistry provides major parts of the course work leading to degrees in the interdisciplinary Programs in Biochemistry/Biophysics and in Chemical Physics. Students whose interests span chemistry and biology or chemistry and physics should see the section on the appropriate program in this bulletin.

Minor in Chemistry

Completion of a minor in chemistry requires at least 17 hours from 200-level and above chemistry courses. Three hours from Biochemistry/Biophysics 364, 366, 371, 372, 563, or 564 and up to 2 hours of Chem 499 may be used to satisfy this requirement.

Credit Limitations

Credit in only one of the chemistry courses in each of the following groups will be given:

(a) Chem 105, 111
(b) 106/107, 212
(c) 217, 221
(d) 240, 340

Lab Charges

A charge for expendable laboratory supplies is made in each laboratory course.

Description of Courses

For explanation see Index under "Symbols"

General and Inorganic Chemistry

Chem

101 [P] Introductory Chemistry 4 (3-3)
Prereq satisfactory Chem Placement Test score. Basic terms, atomic structure, stoichiometry, periodic behavior of elements and compounds, gases, liquids, solids, solutions, water, and simple equilibria.

102 [P] Chemistry Related to Man 4 (3-3)
Prereq Chem 101 or 105. Chemical phenomena in systems important to man and his environment; aqueous solutions, nutrients, nuclear chemistry and abundance of elements, metals and complexes, aspects of organic and bio- logical chemistry.

104 Quantitative Preparation for Chemistry 2 Problem-solving techniques needed for Chem 105. For students showing weak arithmetical preparation on Chem Placement Test.

105 Principles of Chemistry 4 (3-3) Prereq satisfactory Chem Placement Test, or Chem 101 or 104; Math 107 or c/c /.
Stoichiometry, structure, gases, liquids, solids, solutions, thermodynamics, kinetics, equilibrium, volumetric, and gravimetric analysis.

106 [P] Principles of Chemistry 3 Prereq Chem 105 or 111. Acid, base; ionic, molecular, solubility, and redox equilibria; bonding; electrochemistry; coordination, compounds; systematic chemistry of the elements.

107 Qualitative Analysis 3 (0-6) Prereq Chem 106 or c/c /.
Qualitative analysis; identification of various cations and anions.

111 [P] General Quantitative Chemistry Honors 5 (3-6) Prereq 1 yr high school Chem with grade of B or better; superior Chem Placement Test score. A combined course covering general chemistry and quantitative analysis.

191 Independent Study in Modern Chemistry V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq Chem 101, 105, 111 or c/c /.
Independent study in the theory and practice of modern chemistry; written report required.

212 [P] General Quantitative Chemistry
Department of Chemistry

Honors 5 (3-6) Prereq Chem 111. Continuation of Chem 111.


401 Modern Inorganic Chemistry 3 Prereq senior standing; Chem 332. Properties of substances; periodic systems; oxidation-reduction and acid-base characteristics interpreted on the basis of atomic and molecular structure.


503 Advanced Topics in Inorganic Chemistry 1-3 May be repeated for credit. Prereq Chem 502. Recent significant developments.

Analytical, Environmental, and Radiochemistry

Chem

217 Quantitative Analysis 4 (2-6) Prereq Chem 106, 107. Analytical chemistry of the more common elements; acid-based solubility, and redox equilibria treated in lecture and applied in laboratory.


420 (305) Introductory Radiochemistry 3 (2-5) Prereq Chem 106 and 107 or 212; Phys 202. Radioactivity applied to the physical and biological sciences.

423 (405) Nuclear Chemistry 3 Prereq Chem 420. Nuclear reactions and structure; radioactive decay; interactions of radiation with matter; techniques for studying radionuclides. (a/y)

424 Activation Analysis 2 (1-3) Prereq Chem 420 or 331. Principles and methods of neutron and charged particle activation analysis and applications. (a/y)

425 Quantitative Instrumental Analysis 2 Prereq Chem 212, 217, or 221; Chem 332. Electronics and operational amplifier circuitry applicable to chemical instrumentation; principles and applications of modern chromatography, spectrophotometry and electrochemical techniques.

426 Quantitative Instrumental Analysis Laboratory 2 (0-6) Laboratory experience in modern analytical methods.

427 (480) Environmental Chemistry 3 Prereq Chem 212, 217 or 221; Chem 240 or 340. Chemical aspects of selected pollution problems; analytical methods for pollutants; chemical control measures; chemical synergisms. (a/y)

520 (522) Principles of Chemical Analysis 3 Prereq Chem 332, 425. Chemical equilibria in aqueous and non-aqueous systems; chelation titrations; oxidation-reduction; multistage separations, statistical treatment of chemical data; sampling. (a/y)

521 Chromatography 1 Prereq Chem 425. (a/y)

522 Electrochemistry 1 Prereq Chem 425. (a/y)

523 Trace Organic Analysis 1 Prereq Chem 425. (a/y)

524 Trace Element Analysis 1 Prereq Chem 425. (a/y)

525 Mass Spectrometry 1 Prereq Chem 425. (a/y)

526 Analytical Spectroscopy 1 Prereq Chem 425. (a/y)

527 Chemometrics 1 Prereq Chem 425. (a/y)

528 Microprocessors 1 Prereq Chem 425. (a/y)

529 (525) Selected Topics in Analytical Chemistry 2 May be repeated for credit. Prereq Chem 401, 425. Selected current developments. (a/y)

Physical Chemistry
(See also Chemical Physics)

Chem

331 Physical Chemistry 3 Prereq Chem 212, 217, or 221; Math 172; Phys 202, c// in Chem 333. Concepts of physical chemistry; basic thermodynamics; free energy and entropy; phase equilibria; properties of solutions of electrolytes and non-electrolytes.

332 Physical Chemistry 3 Prereq Chem 331; c// in Chem 334. Elementary quantum theory; molecular structure and spectra; bonding theory; reaction rates; photochemistry and radiation chemistry; energy states and statistical thermodynamics.

333 Physical Chemistry Laboratory 1 (0-3) Prereq Chem 331 or c//. Experiments selected to meet the individual needs of students in Chem, C E, MSE, BC/BP, or Bio S.

334 Physical Chemistry Laboratory 1 (0-3) Prereq Chem 333. Continuation of Chem 333. Experiments in molecular
structure, atomic molecular spectroscopy, chemical kinetics.

409 Chemical Group Theory 3 Prereq Chem 332. Mathematical definitions of groups and representations, applications to chemical structure and spectra, ligand field theory, chemical reactions and selection rules. Credit not granted for both Chem 409 and 509. (a y)

430 Photochemistry and Optical Spectroscopy 2 Prereq Chem 332. Quantum description of absorption and emission of light by molecules; photophysical and photochemical behavior of complex molecules; instrumental techniques.

435 Chemical Kinetics 2 Prereq Chem 331. Chemical kinetics; application to inorganic, organic, and biochemical systems. (a y)

509 Chemical Group Theory 3 Graduate level counterpart of Chem 409; additional requirements. Credit not granted for both Chem 409 and 509.

531 Advanced Physical Chemistry I 3 Prereq Chem 332. Chemical thermodynamics, phase equilibria, chemical equilibria, critical phenomena, solution thermodynamics, non-ideal mixtures, colligative effects, surface thermodynamics, and electrochemistry.

532 Advanced Physical Chemistry 3 Prereq Chem 332. Methods of quantum chemistry, atomic and molecular structure and spectra, chemical bonding, statistical mechanics, and kinetic theory, chemical kinetics.


534 Statistical Mechanics 3 Same as Phys 534.

535 Foundation of Quantum Chemistry 3 Prereq Chem 332. Postulates of quantum mechanics, Schrödinger and momentum representations; rotors, harmonic oscillators and hydrogen atom; approximation methods, absorption, emission of radiation.

536 Advanced Quantum Theory 3 Prereq Chem 535. Coupling angular momenta, relativistic quantum theory of spin, atomic and molecular structure, second quantization, density matrices, Green's functions and propagator theory. (a y)

537 Advanced Topics in Physical Chemistry 1-3 May be repeated for credit. Selected subjects; irreversible thermodynamics; chemical bonding; NMR; ligand field theory; x-ray diffraction; neutron diffraction.

Organic Chemistry

Chem 240 Elementary Organic Chemistry 4 (3-3) Prereq Chem 102, or 106 and 107, or 212.

340 Organic Chemistry 3 Prereq Chem 106 and 107, or 212; c / in Chem 341.

341 Organic Chemistry Laboratory 2 (0-6) Prereq Chem 106 and 107, or 212; c / in Chem 340.


343 Organic Chemistry Laboratory 2 (0-6) Prereq c / in Chem 342.

344 Organic Chemistry Honors Laboratory 2 (0-6) Prereq c / in Chem 342. Synthesis and identification of organic compounds by modern techniques and instrumental methods; individual or small group experiments. By interview only.

345 Organic Reactions 3 Prereq Chem 342. Selected organic reactions including mechanisms at an intermediate level.

541 Advanced Organic Chemistry 3 Prereq Chem 332, 343. Reactions of organic compounds; fundamental theory and reaction mechanisms.

542 Advanced Organic Chemistry 3 Prereq Chem 541. Synthesis of organic compounds; recent development from current literature.

543 Theoretical Organic Chemistry 3 Prereq Chem 541. Relationship of reactivity to molecular structure; mechanisms of organic reactions.

544 Advanced Topics in Organic Chemistry 1-3 May be repeated for credit. Prereq Chem 541. Current research in organic chemistry.

546 Spectroscopic Identification of Organic Compounds V 1-3 May be repeated for credit; cumulative maximum 3 hours. Prereq Chem 342. Structural interpretation of ¹H and ¹³C NMR, vibrational and mass spectra of organic compounds; audio-tutorial.
Problems, Seminar, Research, and Thesis

Chem
398  Undergraduate Seminar I For Chem or Biochem majors only.
499  Special Problems V 1-4 May be repeated for credit.
555  Approaches to Chemistry Teaching I May be repeated for credit. Workshop in teaching methods in chemistry.
591  Seminar 1 May be repeated for credit.
600  Special Projects or Independent Study Variable credit.
700  Master’s Research, Thesis, and/or Examination Variable credit.
702  Master’s Special Problems, Directed Study, and/or Examination Variable credit.
800  Doctoral Research, Dissertation, and/or Examination Variable credit.

Biochemistry

For course descriptions and Schedule of Studies in Biochemistry, see Program in Biochemistry and Biophysics.

Schedule of Studies

At least 40 of the total hours required for the bachelor’s degree in this program must be in upper-division courses.

A student undertaking this curriculum after the beginning of the freshman year should consult with the department chair to arrange a schedule which will permit completion of required courses in proper sequence.

Freshman Year

First Semester
Chem 105 Principles 4
Math 107 PreCalculus 3
Engl 101 Composition 3
Bio S Elective 3
Elective 2

Second Semester
Chem 106 Principles 3
Chem 107 Qual Analysis 2
Math 171 Calculus I 4
Hum or Soc S Elective 6
Elective 2

Sophomore Year

First Semester
Chem 221 Quant Analysis 4
Phys 201 Class Phys 4
Math 172 Calculus II 4
Hum or Soc S Elective 3
Elective 2

Second Semester
Chem 340 Organic 3
Chem 341 Organic Lab 2
Phys 202 Class Phys 4
Engl 201 Inter Comp 3
Math 220 Linear Alg 3
Elective 2

Junior Year

First Semester
Chem 331 Physical 3
Chem 333 Physical Lab 1
Chem 342 Organic 3
Chem 343 Organic Lab 2
Ger 101 First Semester 4
Hum or Soc S Elective 3

Second Semester
Chem 332 Physical 3
Chem 334 Physical Lab 1
Chem 398 Seminar 1
Ger 102 Second Semester 4
Hum or Soc S Elective 5
Elective 2

Senior Year

First Semester
Ger 203 Third Semester 4
Chem 401 Inorganic 3
Chem 425 Adv Analytical 2
Chem 426 Adv Anal Lab 2
Elective 4

Second Semester
Elective 15

1Highly qualified students are encouraged to take Chem 111, 212 in place of Chem 105, 106, 107, 221. Students who have taken Chem 101 must take Chem 105, 106, 107, 221, or 102, 106, 107, 221.

2Electives must include 6 hours of advanced chemistry courses based on physical (Chem 332) or organic (Chem 342) chemistry. One of these courses should involve laboratory experience. One course in physics or calculus requiring calculus may be substituted for an advanced course in chemistry. Students should consult their advisers regarding selection of specific courses which satisfy this requirement.

Courses printed in Roman type are required for graduation; those in italics are optional.

Preparation for Graduate Study

As preparation for work toward an advanced degree, it is expected that the student shall have completed courses totaling 40 semester hours of chemistry including inorganic, qualitative, quantitative, organic, and physical chem-
Program in Chicano Studies

Associate Professor and Director, F. V. Padilla; Associate Professor, P. A. Rodriguez; Assistant Professors, J. G. Cruz, M. Ramirez.

The curriculum of the Chicano Studies Program has been designed to present unique qualities of the Chicano cultural experience to all students of Washington State University. It brings to the student a meaningful and working knowledge through its courses in the social sciences and the fine arts.

For majors and non-majors Chicano Studies courses provide a broad interdisciplinary program at the undergraduate level that would equip graduates from many different specialized fields to play more effective educational roles in the Chicano community. Within this framework, students can augment their professional training and activities in business, education, social work, law, applied sciences, and community development.

In addition to the undergraduate degree requirements of the College of Sciences and Arts, the Chicano Studies major must complete 24 semester hours including 18 hours of upper-division work.

Students graduating with a Chicano Studies major must demonstrate a minimal level of proficiency in the Spanish language to that of native speakers of Spanish. This proficiency may be demonstrated by oral and written examinations or by completion of appropriate courses. Further course work in Spanish is strongly urged.

A comprehensive term paper will be required of all Chicano Studies majors upon completion of Chicano Studies 495 Field Experience which will involve community-related activities. The student will participate in a modal learning process which will include three phases: the instructional mode, experimental mode, and the expressive mode under the supervision of the director.

A minor is offered in Chicano Studies and the program offers courses for the teaching major leading to the Bilingual Education (Spanish-English) Certificate Endorsement.

The course of study leads to the degree of Bachelor of Arts in Chicano Studies. Although some upper-division courses could apply as support work for graduate studies in some departments, this program does not offer an advanced degree.

Description of Courses

For explanation see Index under "Symbols"

Ch St

102 [W] English Composition for Chicanos 3 Composition taught within the context of the Chicano linguistic and cultural experience in a pluralistic society.

110 [S] Introduction to Chicano Studies 3 Chicano culture and peoples (Americans of Mexican descent); historical backgrounds and contemporary conditions.

200 Careers in Chicano Studies and Bilingual Education 2 Important issues and career opportunities in Chicano Studies and bilingual-bicultural education.

220 [H] Mexican Art History 3 Same as F A 204.

248 [S] Patterns of Chicano Family 3 Same as CFS 248.

263 Afro-Chicano Drum Ensemble 1 (0-3) May be repeated for credit; cumulative maximum 8 hours. Drumming of Third-World peoples.

272 [S] Chicano Ethnohistory 1921-1910 3 The development of La Raza from 1921 to 1910; major historical and cultural aspects of the La Raza peoples.

313 [S] Social Psychology and the Chicano Community 3 Psychological problems facing the Chicano in society; development of the Chicano child to adulthood.

321 [H] Chicano Art 3 Prereq F A 220. Survey of the artistic expression of the Chicano community from early Spanish settlement to present day in the U.S.

324 [H] Spanish for Chicanos I 3 Same as Span 324.

325 [H] Spanish for Chicanos II 3 Prereq fluency in Spanish; Span 324. Grammar, composition, and readings of Chicano writers.

329 Seminar in Contrastive Linguistics:
Spanish-English 3 Prereq Ch St 324, 325. Contrastive Spanish and English language structures; prepares teachers to predict language-learning problem areas in either language.

332 Chicano Art Seminar 3 Prereq Ch St 220 or 321. Chicano art production; discussion, projects, presentations, and research papers.

335 Bilingual Methods in the Classroom: Social Science, Science, Mathematics 3 Prereq Educ 305; Ch St 329. Social science, science, and math methods for the bilingual-bicultural classroom; development and implementation of units in Spanish.

340 [H] Chicano Dance and Theater 2 Historical and present day images of the Chicano through dance and oral reading performance: beginning and intermediate level.

372 [S] Chicano Ethnography 1910 to Present 3 The Chicano in the U.S. from 1910 to present.

375 Chicano Community Political Organizations 3 Literature on the character, role, and function of Chicano community political organization from 1846 to present.


411 Bilingual Methods in the Classroom: Reading and Language Arts 3 Same as Educ 411.

493 Special Topics in Chicano Studies 3 May be repeated for credit.

495 Field Experience 3-9 May be repeated for credit. Required for majors.

499 Special Problems V 1-4 May be repeated for credit.

Department of Child and Family Studies

Professor and Department Head, D. Z. Price; Professors, M. O. Gallway, A. D. Hill; Associate Professors, M. P. Ray, A. S. Riehle, Assistant Professor, J. J. Dallman.

This curriculum is designed for the student whose major concern is the development and welfare of the individual within a family setting and of the family as a unit. The program focuses on the normal physical, social, cognitive, and affective development and understanding of the individual, and on the functioning of the family in its various social, economic, legal, and political environments. The content of the program is derived from and integrates relevant knowledge in many basic fields such as anthropology, biology, economics, philosophy, psychology, and sociology.

The department offers four major options: Consumer Studies, Family Studies, Child Development, and Preschool Education. An interdisciplinary option in Housing is offered in cooperation with the Department of Clothing, Interior Design and Textiles. The option in Consumer Studies prepares a student for work with consumer-oriented private and government agencies. Employment possibilities also exist with business firms as consumer representatives and consumer liaison people. With selected electives in communication and/or journalism, a variety of consumer-oriented positions in the media are also available. The option also prepares one for credit and financial counseling services with various agencies.

The course of study in Family Studies combined with appropriate electives prepares students for a variety of positions with public and private social welfare and community agencies and junior research positions in the government. When combined with relevant electives, either the Consumer Studies or Family Studies option can prepare a student to work with health organizations, recreation centers, probation centers, gerontology groups, or with agencies concerned with the handicapped. Both options also provide preparation for graduate work leading to teaching, research, or administrative positions in welfare, government, or education.

The Preschool Education Option offers training for professional work in preschool education programs and education for a variety of social services concerned with children. These can include work with foster parent programs, adoption agencies, and various day care or home start programs. The Child Development Option provides basic preparation for graduate study and research in child development leading to a variety of positions in higher education, government, and social agencies in teaching, research, or administration.

The Housing Option prepares a student to represent interests of individuals and families regarding dwellings. Careers related to needs of people in respect to design and layout, financing, planning of housing developments, and impact of new residences on housing production and communities. Positions for gradu-
ates are available in planning, advising, teaching, management, sales and more specific technical areas through business and industry, government agencies and non-profit community based organizations.

Minors are offered in consumer studies, family studies, and child development. For a description of the child studies major in elementary education, refer to the listing of the Department of Education.

The department offers courses of study leading to the degrees of Bachelor of Arts in Home Economics and Master of Arts in Child and Family Studies with a specialization in consumer studies, family studies (family relationships or family resource management), child development, or preschool education.

**Description of Courses**

*For explanation see Index under "Symbols"*

**CFS**

240 Human Development I 3 Prereq Psych 101 or 102, Soc 101; c/ / in CFS 242 for majors in CFS or Home Econ Educ. Major theories of human development; important factors in development and guidance of children from birth into adolescence.

242 Directed Observation 1 (0-3) Prereq Psych 101 or 102, Soc 101; c/ / in CFS 240. Observation of children ages 1-5 years.

247 Human Development II 3 Prereq Psych 101 or 102; Soc 101. Basic structure and processes of all human relationships, developmental processes in adulthood, adolescence through old age, contemporary American family.

248 [S] Patterns of Chicano Families 3 Prereq Psych 101; Soc 101 or Anth 101. Social, cultural, and economic factors affecting interaction of Chicano family members; influences on individual development and functioning.

320 Perspectives on Aging 3 Interdisciplinary examination of aging and the aging process; implications for the quality of life.

342 Curriculum for Young Children's Programs 3 Prereq CFS 240. Curriculum theory, development, implementation and evaluation for early childhood programs for children ages 1-5 years.

344 Guidance of Young Children 3 (2-3) Prereq CFS 240. Application of theories of guidance to children ages 1-5 years; participation in preschool laboratories.

350 Decision Making in Families 3 Prereq CFS 247 or 9 hrs Soc S. Integrated nature of management in families; role of values in decision making.

352 Families as Consumers 3 Prereq Econ 102 or 201; CFS 350. Family's relation to consumer movement; consumer issues; interaction of consumers, government, and market; evaluation of consumer information and protection.

353 Family Housing Decisions 3 Prereq Soc 101; Psych 101 or 102. Housing alternatives which meet human and family needs as affected by social, economic, political, and technical environment.

401 Practice in Preschool Education I 2 (0-6) Prereq CFS 342 or 344. Theory applied to teaching in the preschool.

402 Practice in Preschool Education I 2 (0-6) Same as CFS 401.

440 Theories of Human Development 2 or 3 Prereq CFS 240, 247. Theories of human development and application to programs for children and families. Credit not granted for both CFS 440 and 540.

442 The Child and Family in Poverty 3 Prereq Psych 101; Soc 101. Extent and distribution of poverty and deprivation; social psychology of poverty; effects on individual development and family functioning; compensatory programs.

446 Practice in Preschool Education II 2 (0-6) or 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. Prereq CFS 342, 344. Theory applied to teaching in the preschool.

447 Families in Crises 2 Prereq CFS 247, 450; S W 395. Crises in family life; range of intervention techniques for helping families.


449 Seminar in Child and Family Studies 1 Prereq 9 hours CFS.

450 Management Experiences with Families 2 (0-6) Prereq CFS 350. Integration and application of management principles and processes concerning individuals, families, and community/service agencies.

454 (452) Topics in Family Financial Prob-
lems 1-3 May be repeated for credit; cumulative maximum 9 hours. Prereq Econ 102 or 203; Soc 101; CFS 350; or 9 hrs social science. Role of family in economy; effect of specified social, economic, legal, and political issues on family financial management. Credit not granted for both CFS 454 and 554.

495 Instructional Practicum V 1-4 May be repeated for credit; cumulative maximum 8 hours. By interview only.

498 Field Experience V 1-10 May be repeated for credit; cumulative maximum 10 hours. By interview only. Prereq CFS 450. Supervised individual experiences with related businesses, organizations, or government agencies. Preparation begins two semesters prior to placement.

499 Special Problems V 1-4 May be repeated for credit.

503 Early Childhood Education 3 Development of on-going programs in early childhood education. Cooperative course taught at the University of Idaho.

505 Current Consumer Issues 2 May be repeated for credit. Prereq Econ, consumer or finance course; 3 hrs Psych or Soc. Major problems facing consumers; theoretical and practical implications for families.

540 Theories of Human Development 2 or 3 Graduate level counterpart of CFS 440; additional requirements. Credit not granted for both CFS 440 and 540.

541 Perspectives in Child and Family Studies 2 Research methodologies, relevant professions and problem areas in child and family studies.

542 Seminar in Methods of Developmental Research 3 Prereq 6 hrs child development. Methodology in developmental research; applications to current problems.

544 Family Relations 3 Prereq 9 hrs social science. Contemporary family life; implications for family life education.

546 Organization and Administration of Human Service Programs 3 Legislation, management, programs, personnel, finances, resources, and relationships with other agencies.

548 Topics in Child and Family Studies 2 or 3 May be repeated for credit; cumulative maximum 9 hours. By interview only. Current topics in child and family studies.

549 Seminar in Child and Family Studies 1 May be repeated for credit; cumulative maximum 4 hours.

550 Family Decision Styles 3 Prereq 12 hrs Soc S. Effects of varying value patterns and decision styles on individuals within a family. (a/y)

552 Family Consumption Behavior Prereq Econ 201 or 203; CFS 352, 452, or Econ 312. Consumer decisions as affected by psychological, sociological and economic factors. (a/y)

554 Topics in Family Financial Problems 1-3 May be repeated for credit; cumulative maximum 9 hours. Graduate level counterpart of CFS 454; additional requirements. Credit not granted for both CFS 454 and 554.

555 Sex Roles in Society 3 Examinations of changing roles of males and females in terms of sociological theories of social and institutional change.

557 Social Policy, Law, and the Family 3 Implications of social policy; law for family structure and function, individual development; effects of policy alternatives.

560 Social and Personality Development in Children 3 Prereq 12 hrs child development and/or Psych. Behavioral, cognitive approaches to selected topics, e.g., parent-child relations, modeling, aggression; implications for research and application to natural settings.

563 Seminar in Developmental Research Topics 3 Prereq 6 hrs child development. (a/y)

595 Instructional Practicum V 1-4 May be repeated for credit; cumulative maximum 8 hours. By interview only. Prereq senior or graduate student. Supervised instructional practicum for departmental majors.

598 Professional Internship V 1-8 By interview only. Supervised individual practicum with business, organizations, and government agencies; opportunities for interaction with professionals in related fields.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit. (for master's in C D or H E only)
Schedule of Studies

At least 45 of the total hours required for the bachelor's degree in this program must be in upper-division courses. A major in the department requires Soc 101, Psych 101 and 102, Engl 101, HNF 130, CFS 350, 442, and 450.

In addition, specific options include the following requirements:

**CONSUMER STUDIES OPTION**

CFS 240 or 247; Pol S 101 and 318 or 450; Econ 102, 203, 301, and 312; B Law 210; Mktg 360, 367; Cpr S 405; Soc 342 or 350; CFS 352, 353, 454, and 498; and a course in statistics. Com 101, Spe 235, Env S 101 recommended.

**FAMILY STUDIES OPTION**

Pol S 101 or 206; Econ 201; Soc 270, 330, 351, and 350 or 371; S W 395 and 3 additional hours S W; Soc 362 or 355 or Psych 360 or CFS 440; CFS 240, 242, 247, 352, 353, 447, 448, 454, and 498.

**PRE-SCHOOL OPTION**

Bio S 102 or Chem 101; GenCB 201; Mus 388 or 390; Spe 364, 371; F A 389; H Ed 362; Psych 360, 464 or 473; Soc 320, 351, 410; S W 390 or 395; CFS 240, 242, 247, 342, 344, 440, 446, 447, 448, and 449.

**CHILD DEVELOPMENT OPTION**

Chem 101; Zool 251; GenCB 201; Soc 320, 351, 450; S W 395; Psych 285, 311, 431, 490, 390 or 360; Psych 321 or Soc 350; CFS 240, 242, 247, 342, 344, 440, 446, 447, 448, and 449.

**HOUSING OPTION**

See Housing Option as described under options in Department of Clothing, Interior Design and Textiles.

Department of Civil and Environmental Engineering


The objective of the degree program in civil engineering is to give thorough training in the fundamental principles that form the basis of the profession, care being taken to make the foundation broad enough to prepare the student to pursue a productive professional career. While this broad foundation is emphasized, opportunities are provided for some specialized study in the fields of environmental, geological, hydraulic, structural and transportation engineering.

The curriculum leading to the Bachelor of Science degree in Civil Engineering is accredited by the Accreditation Board for Engineering and Technology (ABET).

The courses in surveying for civil engineers are taught during an intensive summer program on the WSU Campus in Pullman. Attendance at this summer session is required unless equivalent course work has been completed in an accredited curriculum. The summer program should be taken as early as possible so that students may benefit by being able to obtain better summer jobs due to their surveying skills. In addition, surveying skills have been found to be of value in the intern program. Usually after the junior year students wishing to go on internship with an agency or firm can arrange to work for seven months through the departmental intern program coordinator. Valuable practical experience and contacts developed during the internship are beneficial during the last year of undergraduate classwork and in shaping the student's professional career.

Because of the every-increasing knowledge required to practice at high levels of competence in the specialized branches of civil engineering, an educational preparation of five or more years of college study is becoming more important. By an appropriate choice of electives the undergraduate curriculum can be integrated with a graduate program to provide a continuous five-year schedule of studies leading to both the bachelor's and master's degrees.

The department offers courses of study leading to the degrees of Bachelor of Science in Civil Engineering, Master of Science in Civil Engineering, and Master of Science in Environmental Engineering. The department participates in the interdepartmental programs leading to the degrees of Master of Science in Engineering, Bachelor and Master of Science in Geological Engineering, Master of Science
in Environmental Science, and Doctor of Philosophy.

**Description of Courses**

<table>
<thead>
<tr>
<th>Enrollment in the following courses will be restricted to department majors in engineering: C E 301, 302, 315, 317, 318, 322, 330, 351, 403, 414, 416, 417, 418, 421, 422, 424, 425, 426, 450, 451, 453, 434, 455, 456, 457, 450, 451, 463, 464, 475, 480, 495, 499. For explanation see Index under “Symbols.”</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>C E</strong></td>
</tr>
<tr>
<td>101 Introduction to Surveying 3 (2-3) Prereq Math 107; Arch 101 or M E 101. Service course in elementary surveying for non-majors.</td>
</tr>
<tr>
<td>211 Statics 3 Prereq Math 172 or c/; Phys 201 or c/. Engineering mechanics concepts; force systems; static equilibrium; centroids; centers of gravity; shear and moment diagrams; friction; moments of inertia.</td>
</tr>
<tr>
<td>212 Dynamics 3 Prereq C E 211. Kinematics and kinetics of particles and rigid bodies; introduction to mechanical vibration.</td>
</tr>
<tr>
<td>213 Statics and Mechanics of Materials 4 Prereq Math 172; Phys 201. Introduction to statics and mechanics of materials.</td>
</tr>
<tr>
<td>214 Introductory Dynamics 2 Prereq C E 211 or 213. Kinematics and kinetics of particles and rigid bodies.</td>
</tr>
<tr>
<td>299 Civil Engineering Systems 3 Prereq C E 211 or C E major. Civil engineering overview, systems approach, project scheduling, problem modeling, optimization, decision-making.</td>
</tr>
<tr>
<td>301 Principles of Surveying 3 (1-6) Prereq Math 171; M E 101. Basic principles for using instruments and equipment in conducting engineering surveys.</td>
</tr>
<tr>
<td>302 Engineering Surveys 3 (1-6) Prereq C E 301. Field work in application of principles presented in C E 301.</td>
</tr>
<tr>
<td>304 Land Surveying 2 Prereq C E 302. History and development; laws; preparation and filing of property descriptions and plats; subdivision planning; methods for property surveys. Cooperative course taught at the University of Idaho.</td>
</tr>
<tr>
<td>305 Photogrammetry and Photointerpretation 3 (2-3) Prereq C E 302. Geometry of single and stereoscopic pairs of aerial photographs; stereoplotters; photointerpretation; applications to engineering problems. Cooperative course taught at the University of Idaho.</td>
</tr>
<tr>
<td>314 Mechanics of Materials 3 Prereq C E 211. Concepts of stress, strain, and their relationships; axial loads, torsion and bending; combined stresses; properties of materials; columns, repeated loading.</td>
</tr>
<tr>
<td>317 Geotechnical Engineering 1 2 Prereq Geol 102; C E 314 or c/. Required for students in C E and Geol Engr. Historical and current developments, index properties, hydraulic and drainage phenomena, equilibrium, consolidation, shear applications.</td>
</tr>
<tr>
<td>318 Geotechnical Engineering Laboratory 1 1 (0-3) Prereq C E 317 or c/; C E 314 or c/. Required for students in C E and Geol Engr. Evaluation of soil index properties, permeability, consolidation, and shear strength parameters.</td>
</tr>
<tr>
<td>322 Transportation Engineering 3 Prereq QMeth 215; junior in C E. Transportation engineering; demand and performance functions; geometric design; capacity and control of transport modes.</td>
</tr>
<tr>
<td>330 Mechanics of Structures 4 Prereq Cpt S 203; Math 220; C E 314. Classical analysis of statically determinate and indeterminate structures; deflections; influence lines and moving loads; introduction to matrix analysis.</td>
</tr>
<tr>
<td>341 Water Supply and Wastewater Engineering 3 Prereq Bact 101; Chem 105. Water supply development; wastewater collection systems, water transportation and distribution; engineering aspects of water quality.</td>
</tr>
<tr>
<td>342 Water and Wastewater Treatment 3 Prereq C E 341; certified engineering or environmental science majors only. Water and wastewater treatment processes and design.</td>
</tr>
<tr>
<td>351 Hydraulic Engineering V 2 or 4 Prereq C E 315. Principles; hydrology, fluid mechanics, structures, and economic analysis applied to problems of hydraulic engineering.</td>
</tr>
<tr>
<td>403 Environmental Geology 3 Same as Geol 403.</td>
</tr>
<tr>
<td>414 Structural Design Laboratory 2 (0-6) Prereq C E 431, 433. Senior design lab</td>
</tr>
</tbody>
</table>
on the integration of course work into the execution of design.

415 Environmental Measurements 3 (1-6)
Prereq Chem 105; certified engineering or environmental science majors only. Theory and laboratory measurement techniques used in analyzing environmental quality parameters. Credit not granted for both C E 415 and 515.

416 Hydraulic Engineering Laboratory 2
(0-6) Prereq C E 313. Experiments related to fluid flow principles and their application to hydraulic engineering.

417 Geotechnical Engineering II 2 Prereq
C E 317, 318. Slope stability, seepage, groundwater control, improvement in soil properties, field measurements, performance observations, case studies.

418 Geotechnical Engineering Laboratory II
1 (0-3) Prereq C E 417 or C E 318. Soil and rock mechanics testing; unconfined and triaxial testing of soil and rock; rock quality and identification, deformation, field measurements.

421 (418) Transportation Laboratory 2
(0-6) Prereq C E 322. Field work to provide practical application experience in transportation problems.

422 Pavement Design 3 Prereq C E 322.
Structural analysis and design of flexible and rigid pavements for highways and airports.

424 Transportation Engineering and Planning 3
(2-3) Prereq C E 322. Basic principles and methods used by engineers and planners in the planning, designing, and operation of transportation systems.

425 Planning for Civil Engineering 3 Prereq
C E 322. Analytical techniques used by civil engineers in project planning.

426 Engineering Geology and Geotechnics
3 Prereq senior or graduate student in C E or Geol. Procedures and techniques used to evaluate geologic data for site selection and design of engineering structures. Credit not granted for both C E 426 and 526.

430 Quantitative Geomorphology 3 Same
as Geol 430.

431 Structural Steel Design 3 Prereq C E
330. Design of steel structures by working stress design and plastic design; use of AISC Building Specification.

433 Reinforced Concrete Design 3 Prereq
C E 330. Loads: dead, live, wind, earthquake; design of reinforced concrete structures with emphasis on ultimate strength design; ACI Code.

434 Design of Concrete Structures 3 Prereq
C E 433. Composite design; two-way slab systems; prestressed concrete; ACI code.

Analysis and design of foundations; footings, piles, retaining walls, sheet piling; cofferdams; caissons, waterfront structures, piers and abutments. Joint listing with the University of Idaho.

436 Design of Timber Structures 3 Prereq
C E 330 or C E 317. Engineering properties of wood products; analysis and design; connection details, durability and moisture effects; lumber, plywood, glulam, poles, adhesives.

437 Statically Indeterminate Structures 3
Prereq C E 330. Classical methods of frame analysis; moment distribution; slope-deflection; prismatic and non-prismatic members; matrix stiffness method using computer programs.

440 Rock Mechanics 3 (2-3) Same as Geol
440.

450 Hydraulic Design 3 Hydraulic problems
in planning and design of gravity and pressure systems; introduction to unsteady flow. Cooperative course taught at the University of Idaho.

451 Open Channel Flow 3 Prereq C E 315.
Steady, non-uniform flow; controls and transitions in fixed-bed channels.

462 Contracts and Specifications 2 Develop-
ment of law, courts, and ethics; laws on contracts, agency, sales, property, and patents; specifications; preparation of contract documents. Cooperative course taught at the University of Idaho.

463 Engineering Administration 3 Engineering economy; annual cost, present worth, rate of return, and benefit-cost ratio in engineering decision making; basic contract law.

464 Construction Management 3 Job sched-
uling, job planning, project control, records and policies, and construction equipment.

474 Highway Design and Operation 3 Pre-
req C E 322. Fundamentals of geometric design and traffic engineering for urban and rural highways. Cooperative course taught at the University of Idaho.

475 Ground-Water Hydrology 3 Same as
Geol 475. (a/y)
Senior Seminar 1 Professional aspects of civil engineering.

Engineering Internship V 1-4 May be repeated for credit; cumulative maximum 4 hours. By interview only. Placement in a professional, governmental, or industrial situation for specialized or general experience.

Special Problems V 1-4 May be repeated for credit.

Advanced Topics in Transportation Engineering 2-4 May be repeated for credit; cumulative maximum 9 hours. Prereq C E 322; QMeth 215. Analysis, planning, design, and evaluation of transportation modes and systems.

Dynamics of Structures 3 Behavior of structures under impact, impulse, and seismic loads. Joint listing with the University of Idaho.

Theory of Elastic Stability 3 Elastic and inelastic buckling phenomena of bars, beams, frames, and plates. Joint listing with the University of Idaho.

Advanced Mechanics of Materials 3 Elastic stress-strain relations, shear center, unsymmetrical bending, curved beams, elastic stability, elastically supported beams, energy methods, thin plates, shells.

Environmental Measurements 3 (1-6) Graduate level counterpart of C E 415; additional requirements. Credit not granted for both C E 415 and 515.

Geophysical Engineering 4 (3-3) Theory and application of exploratory geophysical procedures in engineering and geological investigations; review of techniques.

Engineering Geology and Geotechnics 3 Graduate level counterpart of C E 426; additional requirements. Credit not granted for both C E 426 and 526.

Advanced Soil Mechanics I 3 Prereq C E 317, 318. Effective stresses and lateral earth pressures; interrelationships of applied stresses, permeability, strain and shear strength of soils. Cooperative course taught at the University of Idaho.

Advanced Foundation Engineering 3 Prereq C E 317. Consolidation theories, bearing capacity, and settlements of foundations, pile group behavior, theory of subgrade reaction, materials foundations, laterally loaded piles.

Computer Methods of Structural Analysis 3 Matrix-stiffness method applied to trusses and frames; elastic-plastic analysis of frames; non-linear and stability analysis of frames.

Advanced Structural Design 3 Advanced concepts in structural design; computer aided design. Joint listing with the University of Idaho. (a/y)

Finite Elements 3 Theory of finite elements; applications to general engineering systems considered as assemblages of discrete elements. Joint listing with the University of Idaho.

Advanced Topics in Structural Engineering 3 May be repeated for credit; cumulative maximum 6 hours. Prereq C E 433. Material properties; design criteria; structural reliability; computer aided design.

Theory of Plates and Shells 3 Mathematical theories of plate and shell solutions; plates of various shapes; large deflections; buckling of plates; membrane theory of shells. (a/y)

Instrumental Analysis of Environmental Contaminants 3 (1-6) Prereq C E 415. Theory and methods of analysis of water and water suspensions for contaminants using electrometric, spectro-photometric, and chromatographic techniques. (a/y)

Environmental Engineering Unit Operations 3 Prereq Math 315; C E 342. Theory and design of physical and chemical unit operations of water and wastewater treatment systems. Joint listing with the University of Idaho.

Environmental Engineering Unit Processes 3 Prereq C E 341. Biochemical energetics and kinetics; biological waste treatment processes; nutrient removal; advanced wastewater treatment design. Joint listing with the University of Idaho.

Advanced Topics in Environmental Engineering Practice V 2-4 May be repeated for credit; cumulative maximum 8 hours. Analysis and evaluation of water and wastewater systems; problems associated with solid waste, radiological health, environmental health or air pollution.

Wastewater Treatment System Design 3 (2-3) Prereq C E 542 or c/. Application of unit operations and processes to design of integrated treatment systems; critical review of designs. Joint listing with the University of Idaho.
Industrial Waste Problems 3 Prereq C E 542 or c/./. Evaluation and feasible solutions of industrial wastes problems. (a/y)

Water Quality Management 3 Prereq C E 542. Principles of systems analysis applied to engineering management of water quality problems. (a/y)

Radiological Health 3 (2-3) Sources and units of radiation and radioactivity, radiological health, radiation detection, and radioactive waste disposal. (a/y)

Advanced Topics in Water Quality Engineering Systems V 2-4 May be repeated for credit; cumulative maximum 6 hours. Analysis and evaluation of natural water systems for retention and transport of pollutants and their associated impacts. (a/y)

Solid Waste Management and Design 3 (2-3) Prereq C E 342. Solid waste management with emphasis on design of processing and disposal facilities. (a/y)

Intermediate Fluid Mechanics 3 Prereq C E 315. Basic flow equations; Navier-Stokes equations; similitude; potential flow, boundary layers, turbulence, and diffusion; uniform and non-uniform conduit flow; drag and lift. (a/y)

Turbulent Flow and Diffusion V 1-3 Prereq C E 315 or M E 303. Theories of turbulent motion; statistical description and numerical models. (a/y)

Advanced Topics in Hydraulic Engineering V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq C E 315. Water hammer, surge tanks, hydraulic machinery, similitude, mixing in rivers and estuaries, hydraulic design. (a/y)

River Engineering 3 Prereq C E 351, 451. Fluid mechanics, morphology, hydrology, and hydraulic engineering as they affect natural and man-made influences on rivers. (a/y)

Hydraulic Design 3 (2-3) Dams, spillways, and outlet works; design of a major structure. Cooperative course taught at the University of Idaho. (a/y)

Numerical Modeling in Fluid Mechanics 3 Fundamentals underlying fluid mechanical modeling; physical basis of the techniques being used. (a/y)


Stochastic Hydrology 3 Prereq C E 351. Applications of probability in hydrology; analyses and evaluation of hydrologic data; regression analyses and simulation techniques. (a/y)

Advanced Hydrology V 1-3 May be repeated for credit; cumulative maximum 5 hours. Prereq C E 351. Principles of hydrometeorology and severe storm analysis; flood and runoff analysis, project design and operation. (a/y)

Water Resources Systems 3 Concepts in water development; coordination of development of other natural resources; systems approach and optimization techniques. Cooperative course taught at the University of Idaho.

Water Resources Planning 3 Prereq C E 351. Design and feasibility studies in water supply, power, flood problems, navigation, irrigation, recreation. Cooperative course taught at the University of Idaho.

(575) Advanced Ground-Water Hydrology 3 Same as Geol 577.

Graduate Seminar 1 May be repeated for credit; cumulative maximum 2 hours. Lectures and reports on current developments in research and practice.

Sanitary Engineering Analysis 2 (1-3) Prereq C E 541. Theoretical and laboratory methods for development of design criteria for sanitary engineering systems. Joint listing with the University of Idaho.

Engineering Aspects of Aquatic Chemistry V 2-4 Prereq C E 342. Chemical principles as applied to water supply and pollution control engineering.

Engineering Aspects of Aquatic Biology 4 (3-3) Prereq C E 583. The role of microorganisms; bacteria, algae, fungi, viruses and protozoa in water and wastewater systems.


Special Projects or Independent Study Variable credit.

Master's Research, Thesis, and/or Examination Variable credit.

Master's Special Problems, Directed
Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit. (for PhD in engineering science only)

Schedule of Studies

A Bachelor of Science degree in Civil Engineering ordinarily requires a total of 134 hours. At least 50 of the total hours required for this degree must be in upper-division courses. None of the courses listed below can be taken on a pass/fail basis.

Freshman Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>Math 171 Calculus I</td>
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<tr>
<td>Chem 105 Principles</td>
<td>4</td>
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<tr>
<td>Engl 101 Composition</td>
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<tr>
<td>M E 101 Graphic Design</td>
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Second Semester

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Math 172 Calculus II</td>
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<tr>
<td>Phys 201 Engineering</td>
<td>4</td>
</tr>
<tr>
<td>Econ 203 Fundamentals</td>
<td>3</td>
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<tr>
<td>M E 102 Descriptive Geom</td>
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<tr>
<td>Geol 102 Physical Geology</td>
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Sophomore Year

First Semester

<table>
<thead>
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<tbody>
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<td>Math 220 Linear Alg</td>
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<td>Math 273 Calculus III</td>
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</tr>
<tr>
<td>Phys 202 Engineering</td>
<td>4</td>
</tr>
<tr>
<td>C E 211 Statics</td>
<td>3</td>
</tr>
<tr>
<td>Cpt S 203 Comp Prog Engrs</td>
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<tr>
<td>Bact 101 Introduction</td>
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Second Semester

<table>
<thead>
<tr>
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<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Math 315 Diff Eq</td>
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<tr>
<td>M E 320 Materials Lab</td>
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<tr>
<td>C E 212 Dynamics</td>
<td>3</td>
</tr>
<tr>
<td>C E 314 Mech of Materials</td>
<td>3</td>
</tr>
<tr>
<td>C E 299 C E Systems</td>
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<tr>
<td>Soc S Elective</td>
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</table>

Summer Engineering Program

<table>
<thead>
<tr>
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<th>Hours</th>
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<tbody>
<tr>
<td>C E 301 Prin of Surveying</td>
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<tr>
<td>C E 302 Engineering Surveys</td>
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Junior Year

First Semester

<table>
<thead>
<tr>
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<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>C E 315 Mech of Fluids</td>
<td>3</td>
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<tr>
<td>C E 317 Geotech Engr</td>
<td>2</td>
</tr>
<tr>
<td>C E 318 Geotech Engr Lab</td>
<td>1</td>
</tr>
<tr>
<td>Stat 360 Statistics</td>
<td>3</td>
</tr>
<tr>
<td>C E 330 Mech of Structures</td>
<td>4</td>
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<tr>
<td>C E 341 Water Supply</td>
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Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>C E 322 Transportation Engr</td>
<td>3</td>
</tr>
<tr>
<td>C E 342 Water &amp; Wastwtr Tr</td>
<td>3</td>
</tr>
<tr>
<td>C E 351 Hydraulic Engr</td>
<td>4</td>
</tr>
<tr>
<td>C E 433 Reinforced Concrete Des</td>
<td>3</td>
</tr>
<tr>
<td>E E 301 E E Fund</td>
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</table>

Senior Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>C E 431 Structural Steel Design</td>
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<tr>
<td>C E 463 Administration</td>
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<tr>
<td>Dept Elect1</td>
<td>3</td>
</tr>
<tr>
<td>M E 301 Thermodynamics</td>
<td>3</td>
</tr>
<tr>
<td>Comm Elective Elective</td>
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Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Dept Elect1</td>
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<tr>
<td>C E 480 Senior Seminar</td>
<td>1</td>
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<tr>
<td>Engl 402 Prof Writing</td>
<td>3</td>
</tr>
<tr>
<td>Hum or Soc S Electives2</td>
<td>3</td>
</tr>
<tr>
<td>Hum Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

1The student may emphasize a particular branch of civil engineering but is encouraged to take courses in several branches to establish a broad, flexible base prior to entering the profession. One lab is required.

2Departmental requirements, not a GUR, above 100 level.

Certification

Certification into the department is the formal acceptance of the student by the department to pursue a professional academic program in that department.

The students who have completed at least 50 semester hours of course work and who have completed Math 171, 172, 220, 273, 315; Phys 201, 202; C E 211, 212, 299, and 314 or their equivalent are eligible to apply for certification into the Department of Civil and Environmental Engineering. The number of students certified into the department depends upon the available resources and facilities. The best qualified students, based on cumulative g.p.a. and grades in the prerequisite courses listed above, will be certified into the department until the carrying capacity is reached. Preference will be given to applications received before April 15 for the fall semester and November 15 for the spring semester.

Freshman students entering the university are placed in the Curriculum Advisory Program (CAP). The College of Engineering participates in the program and each student interested in engineering is assigned an engineering adviser. The students remain in the CAP program until they have completed one year.
of calculus and either two semesters of chemistry or one semester of chemistry and one semester of physics. After completing these courses, the student is eligible to apply for admission to Pre-Engineering. At this point the student should have selected the department in which he or she wishes to study so that a Pre-Engineering adviser in their department may be assigned. During CAP and Pre-Engineering tenure, the student will take the prerequisite courses necessary for certification in the department of his or her choice.

**Transfer Students**

Students who are planning to transfer to civil engineering at Washington State University from other institutions should coordinate their program with the department chairperson to establish an integrated program leading to the bachelor’s degree. Inquiries concerning specific questions are welcome. A strong preparation in mathematics and physics is necessary prior to transfer to minimize the time required to complete the degree requirements.

The requirements for direct entry into the Department of Civil and Environmental Engineering upon transfer are the same as listed above for certification. Applications from transfer students will be handled by the Admissions Office and the students do not need to make separate application to the department.

**Preparation for Graduate Study**

As preparation for academic work toward an advanced degree in civil engineering, geological engineering, or environmental engineering, a student should have completed substantially the equivalent of the above schedule of studies.

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**Department of Clothing, Interior Design and Textiles**

*Acting Department Chair, Joan M. Klopf; Professor, M. Perry; Associate Professors, K. Hatch, J. Klopf; Assistant Professors, C. Bicknell, L. Howell, J. Rogers, S. Slade.*

The Department of Clothing, Interior Design and Textiles offers undergraduate and graduate programs in clothing and textiles and interior design.

The Clothing and Textiles major is concerned with understanding all aspects of clothing and household textile products and their role in society and the family. Concepts from sociology, psychology, business economics, fine arts, and the natural sciences are applied in departmental courses to achieve these goals. A major in Clothing and Textiles permits a concentration in merchandising or in a special concentration. Students in merchandising usually work in management positions which require a knowledge of contemporary retailing and computer science in addition to clothing, interior design, and textiles courses. The career objective of students in the special concentration could be fashion communication, textile research, social-psychological aspects of clothing or fashion design.

The Interior Design major prepares students for residential and commercial interior design positions. Students are qualified to enter the profession as junior interior designers within interior design and architectural firms or with allied fields. The course of study is accredited by the Foundation for Interior Design Education Research (FIDER) and provides a balanced program in the humanities as well as in interior design and architecture.

The department offers courses of study leading to the degrees of Bachelor of Arts in Home Economics, Bachelor of Science in Home Economics, Bachelor of Arts in Interior Design, and Master of Arts in Home Economics.

**Description of Courses**

*For explanation see Index under "Symbols"*

**Clothing and Textiles**

C T

215 Consumer Textiles 3 (2-3)
216 Clothing Construction 3 (2-3) Prereq C T 215; I D 101 or c/. Construction and fitting principles.

217 Introduction to Clothing 2 Prereq Soc 101; Psych 101. Introduction to aesthetic, social, psychological, and economic aspects of clothing.

311 Flat Pattern 3 (1-6) Prereq C T 216. Development of clothing design from a basic pattern.

313 Weaving 3 (1-6) Prereq I D 101 or F A 103; C T 215.

314 Tailoring 3 (1-6) Prereq C T 216. Tailoring techniques in suit and coat making.

315 Textile Products 3 Prereq C T 215; Chem 101. Application of basic textile
concepts to selection and use of textiles; new developments, fundamental concepts for textiles care.

377 (477) Visual Merchandising 2 (1-3) Prereq I D 101 or F A 103. Design principles and elements as they relate to display.

410 History of Costume and Fabrics 3 Prereq C T 215; 3 hrs F A history. (a/y)

411 Clothes and Culture 3 Prereq 3 hrs F A history. Socio-cultural aspects of clothing. (a/y)

412 Original Apparel Design 3 (1-6) Prereq C T 311 or 312. Design and construction of wearing apparel.

413 Clothing Consumption 3 Prereq Econ 201 or 203; Mktg 360. The economic and social conditions which influence clothing consumption.


417 Social Psychological Aspects of Clothing 3 Prereq 12 hrs social science. Research and theory. Credit not granted for both C T 417 and 517.

418 Fashion Theory 3 Prereq C T 217; Mktg 367. Social and economic developments in clothing.

419 Seminar 1 Prereq senior standing.

490 Professional Internship V 1-12 May be repeated for credit; cumulative maximum 12 hours. Not open to freshmen and sophomores. Supervised experience in an approved retailing firm, testing facility or fashion related business.

495 Instructional Practicum V 1-4 May be repeated for credit; cumulative maximum 4 hours. By interview only.

499 Special Problems V 1-4 May be repeated for credit.

513 Experimental Clothing V 2-3 Prereq 6 hrs C T; 6 hrs social science. Concepts and theories in teaching textiles and clothing.

515 Textile Evaluation 3 (2-3) Graduate level counterpart of C T 415; additional requirements. Credit not granted for both C T 415 and 515.

516 Textiles 3 Prereq C T 215, 315. Advanced textiles including research design. (a/y)

517 Social Psychological Aspects of Clothing 3 Graduate level counterpart of C T 417; additional requirements. Credit not granted for both C T 417 and 517.

518 Topics in Clothing and Textiles V 1-3 May be repeated for credit; cumulative maximum 8 hours. Current topics in clothing and textile theory and research.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit. (for master's in H E only)

702 Master's Special Problems, Directed Study and/or Examination Variable credit. (for master's in H E only)

Schedule of Studies

Clothing and Textiles

At least 40 of the total hours required for the bachelor's degrees in these programs must be in upper-division courses. Courses required for the completion of an option cannot be taken on a pass/fail basis.

The merchandising concentration combines departmental courses with courses in economics and business administration to prepare the students for positions in fashion or home furnishings merchandising. Students who complete the C T major receive a Bachelor of Arts degree in Home Economics.

Freshman Year

First Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Engl 101</td>
<td>Composition</td>
<td>3</td>
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<tr>
<td>Soc 101 or Anth 101</td>
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<tr>
<td>Math 101 or Elective</td>
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<tr>
<td>HNF 130 or Sci Elective (GUR)</td>
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<tr>
<td>Elective</td>
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Second Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>I D 101</td>
<td>Basic Env Design</td>
<td>3</td>
</tr>
<tr>
<td>Psych 101 or 102</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Chem 101 or 105</td>
<td></td>
<td>4</td>
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<tr>
<td>Spe Elective (GUR)</td>
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<td>3</td>
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<tr>
<td>Hum or Soc S Elective (GUR)</td>
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Sophomore Year

First Semester

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<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>C T 215</td>
<td>Consumer Textiles</td>
<td>3</td>
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<tr>
<td>F A History (GUR; 201 or above)</td>
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<tr>
<td>Econ Elective</td>
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Second Semester

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>C T 217</td>
<td>Intro to Clothing</td>
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<tr>
<td>Econ 203 Fund Micro</td>
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<tr>
<td>B Law 210 Law &amp; Bus</td>
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<td>3</td>
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<tr>
<td>Math 201 Finite Math</td>
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<tr>
<td>Elective</td>
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Junior Year

**First Semester**
- CIDT Elective: 3
- Acc 230 Prin Acctg I: 3
- Mkgt 360 Marketing: 3
- C T 377 Visual Merch: 2
- CFS 350 Dec Making: 3

**Second Semester**
- C T 315 Textile Prod: 3
- Mkgt 367 Consumer Beh: 3
- CIDT Elective: 3
- Electives: 6

Senior Year

**First Semester**
- C T 413 Clothing Cons: 3
- CIDT Elective: 3
- Mgr 301 Prin Mgr Org: 3
- Electives: 6

**Second Semester**
- C T 418 Fashion Theory: 3
- C T 419 or I D 491: 1
- Cpt S 220 or 405: 3-4
- Mkgt 470 Retailing Mgt: 3
- CIDT Elective: 3
- Electives: 2-3

\*55 Math Score Pre-College Test or Math 101

**CIDT Electives:** C T 311, 313, 314, 415, 410, 411, 417, 490 or I D 102, 103, 211, 212, 222, 401.

The CT Special Concentration Option includes a core of General University Requirements and Clothing, Interior Design and Textile courses plus the concentration of 54 hours. Students interested in a special concentration should contact the department for requirements.

**Core Requirements**
- 43 hours—I D 101, C T 215, 217, 419; CFS 350; Psych 101 or 102, Soc 101 or Anth 101, Chem 101 or 105, Speech elective, Engl 101, 6 hours Humanities, 6 hours Science electives, and 3 hours Economics.

**Minor in Clothing and Textiles**
A minor in clothing and textiles requires the student to take a minimum of 18 hours in the department, including the 9 hour core and a minimum of 9 hours of upper-division work. Students interested in a C T minor should contact the department for the list of requirements.

**Description of Courses**

For explanation see Index under "Symbols"

**Interior Design**

I D

101 Basic Environmental Design 2 or 3
(2-2) Sensory environment as a design determinant; problem-formulating and problem-solving processes.

102 Perception and Communication I 2
(0-4) or 3 (0-6) Prereq c// in I D 101. Theoretical concepts relating to design objects and elements explored through various design and communication media.

103 Perception and Communication II 3
(1-4) Prereq I D 101, 102. Developing perceptual awareness and use of media to convey sensory data and meaning.

202 The Built Environment 3 Same as Arch 202.

211 (372) History of Design I 3 Design forms from prehistoric periods through the Gothic period.

212 (373) History of Design II 3 Prereq I D 211. Interiors and furnishings from Renaissance period through the contemporary movement in Europe and the United States.

221 (170) Fundamental Residential Planning 3 (1-4) Prereq I D 103. Design investigations of personal space of limited size and complexity for people of varying social, economic, educational, and cultural backgrounds.

222 (271) Advanced Residential Design 3
(1-4) Prereq I D 221. Design of multifunction, multi-unit living environments; future trends in urbanization, technology, and population needs in housing.

333 (370) Fundamental Commercial Planning 3 (1-4) Prereq I D 103. Design of commercial environmental situations to aid students in developing insights into needs of the corporate client.

334 (371) Advanced Commercial Design 3
(1-4) Prereq I D 333. Complex commercial design problems; problem identification and design development through collaborative efforts of a design team.

401 (475) Residential Interior Design 3
(2-2) Prereq I D 101 or FA 103; CFS 350. For non-majors only. Elements and principles of design as they relate to interiors.
425 Senior Thesis in Interiors 4 (1-6) Prereq I D 222, 334. Supervised development of design solutions and working drawings for residential/commercial thesis projects based upon program needs of real clients.

490 (375) Professional Internship V 1-12 May be repeated for credit; cumulative maximum 12 hours. Prereq I D 334. Supervised experience in an approved design firm or related business. Academic supervision by faculty adviser; professional supervision by project manager.

491 (479) Seminar I May be repeated for credit; cumulative maximum 4 hours.

495 Instructional Practicum V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prereq senior standing. By interview only.

499 Special Problems V 1-4 May be repeated for credit.

597 (570) Advanced Design Theory 3 (1-6) Prereq I D 456. Current research in environmental or product design and development.

598 (573) Topics in Interior Design V 1-3 May be repeated for credit; cumulative maximum 6 hours. Perception and use of interior space on human behavior and interaction patterns in both residential and commercial interiors.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit (for master's in H E only)

702 Master's Special Problems, Directed Study, and/or Examination Variable credit. (for master's in H E only)

**Schedule of Studies**

**Interior Design**

At least 40 of the total hours required for the bachelor's degree in interior design must be in upper-division courses. Courses required for the completion of an option cannot be taken on a pass/fail basis.

**Freshman Year**

**First Semester**

<table>
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<th>Hours</th>
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<tbody>
<tr>
<td>I D 101 Env Design</td>
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<tr>
<td>I D 102 Perc &amp; Comm I</td>
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<td>Engl 101 Engl Comp</td>
<td>3</td>
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<tr>
<td>Soc 101 or Anth 101</td>
<td>3</td>
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<tr>
<td>Arch 101 Arch Comm I</td>
<td>3</td>
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</table>

**Second Semester**

<table>
<thead>
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<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>I D 103 Perc &amp; Comm II</td>
<td>3</td>
</tr>
<tr>
<td>I D 202 Built Env</td>
<td>3</td>
</tr>
<tr>
<td>F A 110 or 111</td>
<td>3</td>
</tr>
<tr>
<td>Psych 101 or 102</td>
<td>3</td>
</tr>
<tr>
<td>Arch 102 Graphics</td>
<td>3</td>
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</table>

**Sophomore Year**

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>I D 221 Fund Res Plan</td>
<td>3</td>
</tr>
<tr>
<td>I D 211 History of Design I</td>
<td>3</td>
</tr>
<tr>
<td>C T 215 Consumer Textile</td>
<td>3</td>
</tr>
<tr>
<td>Spe 102 Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>Spe 263 Scen Const &amp; Paint</td>
<td>3</td>
</tr>
</tbody>
</table>

**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>I D 222 Adv Res Design</td>
<td>3</td>
</tr>
<tr>
<td>I D 212 History of Design II</td>
<td>3</td>
</tr>
<tr>
<td>Phys 101 or 380</td>
<td>3</td>
</tr>
<tr>
<td>Spe 363 Light for Theatre</td>
<td>3</td>
</tr>
<tr>
<td>Supportive Elective</td>
<td>3</td>
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**Junior Year**

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>I D 333 Fund Comm Plan</td>
<td>3</td>
</tr>
<tr>
<td>Arch 331 Materials &amp; Const I</td>
<td>3</td>
</tr>
<tr>
<td>Arch or F A Hist (201 or above)*</td>
<td>3</td>
</tr>
<tr>
<td>B Law 210</td>
<td>3</td>
</tr>
<tr>
<td>F A 380 or Supportive Elective</td>
<td>3</td>
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</tbody>
</table>

**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>I D 334 Adv Comm Design</td>
<td>3</td>
</tr>
<tr>
<td>I D 491 Seminar</td>
<td>3</td>
</tr>
<tr>
<td>CFS 353 Housing</td>
<td>3</td>
</tr>
<tr>
<td>Sci Elective*</td>
<td>3</td>
</tr>
<tr>
<td>Arch 454, 490, and 493</td>
<td>3</td>
</tr>
<tr>
<td>Supportive Elective</td>
<td>3</td>
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</table>

**Summer**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>I D 490 Professional Internship</td>
<td>4</td>
</tr>
</tbody>
</table>

**Senior Year**

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>I D 425 Senior Thesis</td>
<td>4</td>
</tr>
<tr>
<td>I D 491 Seminar (Intern)</td>
<td>1</td>
</tr>
<tr>
<td>Sci Elective*</td>
<td>4</td>
</tr>
<tr>
<td>VTE 426 Graphics</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
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</tbody>
</table>

**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>I D 425 Senior Thesis</td>
<td>4</td>
</tr>
<tr>
<td>Arch or F A Hist (201 or above)*</td>
<td>3</td>
</tr>
<tr>
<td>Supportive Elective</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>6</td>
</tr>
</tbody>
</table>

Supportive Electives (at least 4 hours in basic or creative art): Arch 201; Cpt S 480; C T 313, 377; Econ 201; F A 331, 332, 340, 350, 360, 370, 380; L A 264; VTE 221, 322;
transfer interior design hours as approved by department.

*General University Requirements for Graduation.

Certification Requirements
The criteria for certification in interior design are currently under review. Students wishing to major in interior design should contact the department for additional requirements.

Preparation for Graduate Study
Normally the applicant for graduate study should have an undergraduate major in Clothing and Textiles or Interior Design. However, candidates with a good record in related fields may be well prepared for certain areas of advanced study. Students from related disciplines would be required to take some courses required of undergraduate majors in these fields.

Department of Communications


The curricula in the Department of Communications are designed to prepare students for careers in the mass media and related fields. Although focus is placed on the knowledge and skills essential in these areas, the department builds upon a firm base of liberal undergraduate education drawn from other academic disciplines.

Theoretical training and laboratory workshop methods are combined with practical experience on student publications, including a daily newspaper, in the activities of campus-based television and radio stations, and an internship program.

Students may follow a general course of study within the department, or may select a primary area of interest for specialized study: advertising, broadcasting, journalism, speech communication, or public relations.

The department offers courses of study leading to the degree of Bachelor of Arts in Communications. It also offers master's programs in mass communications and speech communication.

Teacher training is done in cooperation with the Department of Education, and a major in agricultural communications is offered in cooperation with the College of Agriculture.

Description of Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Units</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>395</td>
<td>Communications Practicum V 1-6 May</td>
<td>1-6</td>
<td>May be repeated for credit; cumulative maximum 6 hours. By interview only. Credit not granted for both Com 395 and 495.</td>
</tr>
<tr>
<td>410</td>
<td>History of Mass Communications 3 For seniors and graduate students.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>415</td>
<td>Law of Mass Communications 3 For juniors, seniors, and graduate students.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>470</td>
<td>Mass Communications Theories and Theory Construction 3 Traditional and new theories of mass communications and the process of theory construction.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>475</td>
<td>Seminar in Communications 3 May be repeated for credit; cumulative maximum 9 hours. By interview only. For seniors and graduate students.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>481</td>
<td>Media Management 3 For seniors and graduate students.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>490</td>
<td>Research Methods 3 For seniors and graduate students.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>495</td>
<td>Professional Internship 12 By interview only. Credit not granted for both Com 395 and 495.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>499</td>
<td>Special Problems V 1-4 May be repeated for credit.</td>
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</tbody>
</table>

Advertising

Adver
280 Advertising Principles and Practices 3 Not open to freshmen.
380 Broadcast Advertising 3 (2-3) Prereq
Bdcs 245 or Jour 225; Adver 280. For juniors and seniors.

382 Print Advertising 3 (2-3) Prereq Bdcs 245 or Jour 225; Adver 280. For juniors and seniors.

395 Advertising Practicum V 1-6 By application only. Credit not granted for both Adver 395 and 495.

475 Seminar in Advertising 3 By interview only. May be repeated for credit; cumulative maximum 9 hours. For seniors and graduate students.

480 Advertising Agency Operation and Campaigns 3 (2-3) Prereq Adver 380, 382.

495 Professional Internship 12 By interview only. Credit not granted for both Adver 395 and 495.

499 Special Problems V 1-4 May be repeated for credit.

Broadcasting
Bdcs 245 (105) Broadcast News Writing, Reporting, and Editing 3 (2-3) Prereq demonstrated proficiency in typing, grammar, spelling, and punctuation. The typing proficiency requirement will be waived on an individual basis for otherwise qualified handicapped students.

250 Introduction to Broadcasting 3 Not open to freshmen.

255 Audio Writing and Production 2 (1-3) Prereq Bdcs 245, 250.

355 Television Writing and Production 4 (2-6) Prereq Bdcs 255. For juniors and seniors.


395 Broadcasting Practicum V 1-6 By application only. Credit not granted for both Bdcs 395 and 495.

455 Television Workshop 3 (1-6) Prereq Bdcs 355. May be repeated for credit; cumulative maximum 6 hours.

465 Broadcast News Writing, Reporting, and Editing 3 (2-3) May be repeated for credit; cumulative maximum 6 hours. Prereq Bdcs 365.

475 Seminar in Broadcasting 3 May be repeated for credit; cumulative maximum 9 hours. By interview only. For seniors and graduate students.

495 Professional Internship 12 By interview only. Credit not granted for both Bdcs 395 and 495.

499 Special Problems V 1-4 May be repeated for credit.

Cinema and Photography
Cine 253 Photo-communications 3 (2-3)
323 [H] History of the Cinema I 3 (2-3)
333 (393) History of the Cinema II 3 (2-3)

368 Visual Communication in Theatre, Film, and Television 3 Same as Spe 368.

375 Photographic History and Criticism 3 Prereq Cine 253. Photography as an art form.

395 Cinema and Photography Practicum V 1-6 By application only. Credit not granted for both Cine 395 and 495.

433 Film Criticism and Analysis 3 Prereq Cine 323, 333. For juniors and seniors.

433 (363) Evolution of Cinematic Style 3 Prereq Cine 323, 333.

453 Color Photography 3 (2-3) Prereq Cine 253.

463 Advanced Film Production 3 (2-3) May be repeated for credit; cumulative maximum 6 hours. Prereq Cine 355.

473 (393) Film Scriptwriting 3 Prereq Cine 443.

475 Seminar in Cinema Studies 3 By interview only. May be repeated for credit; cumulative maximum 9 hours. For seniors and graduate students.

495 Professional Internship 12 By interview only. Credit not granted for both Cine 395 and 495.

499 Special Problems V 1-4 May be repeated for credit.

Journalism
Jour 125 Press and Society 3
225 Newswriting 3 (2-3) Prereq demonstrated proficiency in typing, grammar, spelling, and punctuation. The typing proficiency requirement will be waived on an individual basis for otherwise qualified handicapped students.

305 Reporting 3 Prereq Jour 225.

325 Advanced Reporting 3 Prereq Jour 305.

330 News Editing 3 (2-3) Prereq Jour 325 or c/s.

395 Journalism Practicum V 1-6 By application only. Credit not granted for both Jour 395 and 495.

425 Reporting of Public Affairs 3 Prereq
Jour 325, 330. For seniors and graduate students.

430 Critical Writing 2
475 Seminar in Journalism 3 By interview only. May be repeated for credit; cumulative maximum 9 hours. For seniors and graduate students.

495 Professional Internship 12 By interview only. Credit not granted for both Jour 395 and 495.

499 Special Problems V 1-4 May be repeated for credit.

Public Relations

P R
312 Public Relations 3 Prereq Jour 225.
313 Public Relations Writing and Editing 3 (2-3) Prereq Jour 305; P R 312.
395 Public Relations Practicum V 1-6 By application only. Credit not granted for both P R 395 and 495.
413 Public Information 3 Prereq P R 312. For seniors and graduate students.
475 Seminar in Public Relations 3 By interview only. May be repeated for credit; cumulative maximum 9 hours. For seniors and graduate students.
495 Professional Internship 12 By interview only. Credit not granted for both P R 395 and 495.

499 Special Problems V 1-4 May be repeated for credit.

Speech Communication

SpCom
101 Principles of Interpersonal Communication 3 Theory and practice of interpersonal communication; understanding and applying intrapersonal information in interpersonal settings.


112 [H] Fundamentals of Speech 3 Various aspects of speech with primary emphasis on those of a humanistic nature: rhetoric, theatre.

200 Speech Communication K-12 3 The application of speech communication to the teacher and to teaching methods in grades K through 12.

234 Parliamentary Procedure 2 History and philosophy underlying parliamentary procedure; using parliamentary procedure principles in meetings.

235 [C] Principles of Group Communication 3 (2-3) Theoretical and practical aspects of communication in groups; classroom exercises and films demonstrate theoretical principles.

250 [H] Oral Reading of Literature 3 Analyzing and oral reading of prose, poetry and drama; sharing literature with an audience.

301 Advanced Principles of Interpersonal Communication 3 Prereq Spe 101 or 112. Theoretical literature relevant to analyzing relationships; students use this information to analyze a relationship.

302 [C] Advanced Public Speaking 3 Advanced principles of public speaking and their practical implementation for effective communication.

325 [S] Language and Human Behavior 3 Use of language, both verbal and nonverbal, to influence human behavior in problem solving and conflict resolution.

330 [C] Argumentation 3 (2-3) Theory and analysis of the types of arguments in everyday use.


351 Advanced Interpretation 3 Historical approach to the oral presentation of poetry, prose, drama, and speeches with interpretative reading and scripting assignments.

400 Application of Communication Theory 3 Extant communication theory; its application in an occupational setting.

401 Persuasion 3 Theory and practice of persuasive speaking.

405 Applied Interpersonal Communication 3 Prereq Spe 101, 301, or juniors and seniors in Educ, Psych, or S W. How a person relates to others; cognitive and affective parts of the process.

415 Verbal and Nonverbal Systems 3 Verbal and nonverbal symbol systems and their interrelation in communication.

425 History and Criticism of Public Address 3 Critical analysis of the rhetoric of movements, campaigns, and significant speakers.

435 Speech Pedagogy 3 Prereq 8 hrs Spe. Principles, history, philosophies, and methods of speech education; objectives, materials, and procedures in directing class and cocurricular activities.

451 Theory and Application of Readers Theatre 3 Prereq Spe 351. Literature
for oral presentation; scripting, and preparation of the literature to standards for public performance, directing readers theatre.

Internship in Organizational Communication V 3-12 May be repeated for credit; cumulative maximum 12 hours. Prereq Spe 400. Participation as intern in the communication activities of a public or private organization.

Speakers Forum 1 May be repeated for credit; cumulative maximum 6 hours. Practicum in public advocacy on controversial issues.

Readers Theatre 1 May be repeated for credit; cumulative maximum 6 hours. Using a form of oral interpretations, selecting material for scripts, assisting in productions, and participating in public performances.

Instructional Practicum 1 May be repeated for credit; cumulative maximum 4 hours.

Seminar in American Studies 3 May be repeated for credit; cumulative maximum 6 hours. Same as Engl 513.

Interpersonal and Small Group Communication 3 Theory and research in interpersonal and small group communication. (a/v)

Rhetorical Theory and Criticism 3 Significant theories of rhetoric and rhetorical criticism from Plato and Aristotle to Kenneth Burke.

Seminar in Speech Education 3 May be repeated for credit; cumulative maximum 6 hours. Research in current problems in the area of speech education.

Seminar in the Teaching of Speech 2 May be repeated for credit; cumulative maximum 6 hours. Problems and methods in the teaching of speech.

Seminar in Rhetoric and Communication 3 May be repeated for credit; cumulative maximum 6 hours. Special topics in rhetoric, communication, and public address.

Certification Requirements
To certify a major in Communications, a student must have earned at least 45 semester hours and meet the following minimum requirements: (1) C grade in Jour 225 or Bdst 245, (2) C grade in the introductory course in the major sequence (Adver 280, Bdst 250, Cine 323, Jour 125, P R 312), (3) 2.7 cumulative g.p.a. in communications courses, (4) 2.5 cumulative g.p.a. in all courses. Students in the Speech Communication sequence will substitute the following courses for (1) and (2) above: SpCom 101, 102, or 112; 3 additional hours SpCom at the 200-300-level.

Students transferring into the department with 55 or more hours are urged to complete Communications certification requirements within two semesters.

General Departmental Requirements
Each student will complete the requirements of one of the following sequences and accumulate a minor of 18 hours in a second department. At least 81 of the 120 hours required for the B.A. in Communications must be taken in other departments. Transfer students, in meeting the requirements of their chosen sequence, must take a minimum of 15 credit hours in the department.

SEQUENCE REQUIREMENTS
All sequences require a minimum of 30 semester hours in Communications.

Advertising
Bdst 245 or Jour 225; Adver 280, 380, 382, 382, 480, 495; Mktg 360 OR: Bdst 245 or Jour 225; Adver 280, 380, 382, 480; Mktg 360, 12 hours electives in the department.

Broadcasting
All broadcasting majors must complete Bdst 245, 250, 255, and 475, and Com 415 and 481. Broadcast news majors will also take Bdst 365, 465, and 495 (or 12 hours of Communications department electives in lieu of 495). Broadcast production majors will also take Bdst 355, 455, and 495 (or 12 hours of Communications department electives in lieu of 495).

General Communications
A program of study in this major of at least 30 hours in communications, advertising, broadcasting, cinema, journalism, speech communication, or public relations, is worked out by the student and the department chairperson prior to certification of major in this sequence.

Journalism
Jour 225, 305, 325, 330; Com 410, 415; Jour 495 OR: Jour 225, 305, 325, 330, 425, and 475; Cine 253; Com 410 and 415, and 3 hours electives in the department.
Public Relations
Jour 225, 305; Adver 280; P R 312, 313, 413;
Com 415 or other law courses; Com 490 or
Soc 320; P R 495, Mktg 360 OR: Jour 225,
305; Adver 280; P R 312, 313; Jour 325; P R
413; Com 415 or other law course; Com 490
or Soc 320; Mktg 360; 3 hrs electives in the
department.

Speech Communication
Students choosing this option must complete
21 hours of core courses and satisfy the re-
quirements listed below for Liberal Arts or
Organizational Communication. At least 18
hours must be upper division.

CORE REQUIREMENTS
3 hrs from SpCom 101, 102, 112
3 hrs from SpCom 235, 301, 405
One course from SpCom 234, 250, 351, 451
6 hrs from SpCom 302, 303, 331
6 hrs from SpCom 325, 401, 415, 425

(1) Liberal Arts
At least 11 hours of the following speech com-
munication courses in addition to those taken
in the core above:
3 hrs from SpCom 235, 301, 405
One course from SpCom 234, 250, 351, 451
6 hrs from SpCom 325, 400, 401, 415, 425
Completion of a 16-hour minor in a depart-
ment within the Division of Humanities and
Social Sciences.

(2) Organizational Communication
Demonstrated proficiency in typewriting is
required to begin this focus.
At least 9 hrs related courses in Hum/Soc
S or Economics\(^1\)
3-12 hrs Spe 429
Spe 400
Engl 201 or 301
12 hrs from Pol S 440, 443, 445; Psych
306, 350; Soc 371, 373, 440
Adver 280, Jour 225, P R 312
B Law 210, 410, Mgt 301, Mktg 360\(^2\)
Electives approved by the speech communi-
cation faculty.

\(^1\)Chosen with adviser approval. Students are
couraged to complete a formal minor in one of
these areas to satisfy this requirement.

\(^2\)Business courses subject to availability.

DEPARTMENTAL MINORS
Students declaring a minor in communication
must choose one of the following sequences
and complete a minimum of 18 hours, includ-
ing 9 upper-division hours and the following
required courses: Advertising Minor: Bcdst
245 or Jour 225; Adver 280, 380, 382.
Broadcasting: Bcdst 245, 250; Com 415,
Bcdst 475. Journalism: Jour 225, 305, 325,
330; Com 410, 415. Public Relations: Jour
225, 305; P R 312, 313, 413. Speech Com-
munication: 18 hours of approved SpCom
courses.

AGRICULTURAL COMMUNICATIONS
This is a major in the College of Agriculture,
in cooperation with the Department of Com-
munications. The student declaring this major
must complete the requirements of the gen-
eral agriculture curriculum and accumulate a
minimum of 30 hours in the Department of
Communications, including any communica-
tions courses used to satisfy general agricul-
ture requirements. Those electing this major
should make that decision known as early as
possible in their academic career. Agricultural
communications majors should complete the
following: Print Media: Jour 225, 305; Cine
253; P R 312, 313, 413; Com 490, and 9
elective hours in the Department of Com-
munications. Broadcast Media: Bcdst 245, 250,
255, 355, 365; P R 312, 313, 413; Com 490,
and 7 elective hours in the Department of
Communications. The student should consult
with a Department of Communications adviser
before registering for elective courses. Special-
ized programs patterned for individual career
aspirations may be developed in conjunction
with the head of the Department of Communica-
tions or a designated representative.

TEACHER TRAINING
Students preparing to teach should consult the
catalog listing of the Department of Education
for certification requirements. Students major-
ing or minoring in communications for pur-
poses of teacher certification should make that
intent known to the head of the Department of
Communications as early as possible in their
academic career.

Department of Comparative
American Cultures

Professor and Department Chair, W. Willard;
Asian American Studies, Assistant Professors,
G. Nomura, S. Sumida; Black Studies, Associ-
ate Professor, T. Anderson; Assistant Profes-
sors, F. Boateng, E. Smith; Chicano Studies,
Associate Professors, F. Padilla, P. Rodriguez;
Assistant Professors, J. Cruz, M. Ramirez;
Native American Studies, Professor, W. Wil-
lard.
The Department of Comparative American Cultures offers courses of study in Asian American Studies, Black Studies, Chicano Studies, and Native American Studies (see Studies' section).

Asian American Studies offers an interdisciplinary study of Asian Americans, with an emphasis on their lives, role and achievements. The curriculum is designed to provide a broad, systematic understanding of Asian Americans, quite distinct and apart from the traditional cultures of their origins. A minor in Asian American Studies is offered.

The Black Studies Program examines from an interdisciplinary approach the historical, social, political behavior and economic experience of Afro-Americans and people of African descent throughout the world. The course of study leads to the degree of Bachelor of Arts in Black Studies. Eighteen (18) credit hours in Black Studies have been approved as a minimum requirement for a minor in Black Studies. Please see details under section on Program in Black Studies.

Chicano Studies offers a major which leads to the degree of Bachelor of Arts in Chicano Studies. Although some upper-division courses could apply as support work for graduate studies in some departments, this program does not offer an advanced degree. The program also offers a minor in Chicano Studies and courses for the teaching major leading to Bilingual-Bicultural Education (Spanish-English) Certificate Endorsement.

The Native American Program offers a minor which requires a minimum of 16 hours of credit, half of which must be upper-division course work. The curriculum is designed to offer interdisciplinary study in a wide spectrum of courses to provide a broad knowledge of Native American culture.

D. J. Lynch; Adjunct Associate Professor, J. R. Kosorok; Adjunct Assistant Professors, D. W. Fraley, L. G. Niccoli; Adjunct Lecturers, K. Eckblaw, L. J. Gannon, J. L. Hockenbuhl, J. Lewis, R. E. Maban, T. J. Matfield, M. G. Piepho, S. D. Rossier, T. A. Seim, J. J. Thomas.

Computer science encompasses the theory and techniques by which information is encoded, stored, communicated, transformed, and analyzed. It deals particularly with the theory of algorithms (i.e., effective procedures), with the structure of languages for the expression of algorithms, and with the design of efficient algorithms for the solution of practical problems. Of central concern is the study of computer systems (hardware and programs) for the automatic execution of these algorithms.

Computer science has its principal bases in engineering and mathematics. In addition, it draws upon concepts from a wide variety of other disciplines such as linguistics, psychology, biology, philosophy, and economics. It has applications to these and other disciplines.

Facilities at the Washington State University Computing Service Center include an Amdahl 470 V8. The department owns a VAX 11/750, a PDP 11/60, many LSI-based systems and other microcomputers, a De Anza graphics/imaging system and an 8 pen color plotter.

A digital techniques laboratory is used for research and instruction in high-speed logic circuits, and digital communications.

The department offers courses of study leading to the degrees of Bachelor of Science in Computer Science, Master of Science in Computer Science, and Doctor of Philosophy.

**Description of Courses**

*For explanation see Index under "Symbols"

Cpt S

140 (200) [Z] Concepts of Computer Science 3 History, architecture, uses, capabilities, and social implications of digital computers; interactive text editing systems.

150 Computer Program Design and Development 2 Prereq Math 107; c/ in Cpt S 151, 152, 153, or 154. Formulation of problems and the top-down design of procedures for their solution on a digital computer; structured programming methodology.

151 FORTRAN Programming Laboratory 2 (1-3) Prereq Cpt S 150 or c/; Math
171 or 202. Comprehensive programming practice using FORTRAN.

152 COBOL Programming Laboratory 2 (1-3) Prereq Cpt S 150 or c/f. Comprehensive programming practice using COBOL.

153 BASIC Programming Laboratory 2 (1-3) Prereq Cpt S 150 or c/f. Comprehensive programming practice using BASIC.

154 PASCAL Programming Laboratory 2 (1-3) Prereq Cpt S 150 or c/f. Comprehensive programming practice using PASCAL.

203 Computer Programming for Engineers 2 (1-3) Prereq Math 171. Use of FORTRAN in solving problems related to engineering applications; WSU Scientific Subroutine Library; laboratory practice in programming. Credit not granted for both Cpt S 151 and 203.

240 (235) Programming Language V 1-3 May be repeated for credit; cumulative maximum 3 hours. Prereq Cpt S 150; Cpt S major. Advanced concepts of various programming languages. Continuation of Cpt S 151, 152, 153, and 154; or different programming language.

250 (211) Advanced Programming 3 Prereq Cpt S 150, 154. Advanced programming techniques: data structures and program design principles; nonnumeric computing.


316 Discrete Structures 3 Prereq Cpt S 150 and 151 or 154; Math 220. Introduction to and applications of set theory; discrete structures, elementary logic, and combinatorics.

330 (310) Numerical Computing 3 Prereq Cpt S 150, 151; Math 172. Design and implementation of various numerical algorithms in FORTRAN; use of library routines in solving numerical problems.

335 (364) Principles of Organization 3 Same as Math 364.

350 (325) Data Structures and Data Management 3 Prereq Cpt S 250; Cpt S major. Data structures and their applications in storage and file management and in database systems.

360 (315) Systems Programming 4 (3-3) Prereq Cpt S 250, 260; Cpt S major. Implementation of systems programs, concepts of computer operating systems; laboratory experience in using operating system facilities.

370 (320) Systems Analysis and Design 3 Prereq Cpt S 150, 152, or 154. Analysis and design of computer-based systems typically found in a business environment; related programming projects.

405 (480) The Use of Computer Systems 3 Not open to freshmen or sophomores. Computers, computer systems, and software packages for advanced students in other disciplines; hands-on use. No previous computer experience required.

420 (414) Fundamentals of Digital Systems 3 Same as E E 414.

430 (448) Numerical Analysis 3 Same as Math 448.

432 (417) Introduction to Simulation 3 Same as QMeth 417.

435 (470) Computer Methods in Probability and Statistics 3 Prereq Cpt S 150, 151; Math 172, 220; Stat 429 or 433. By interview only. Extensive use of computers to generate random variables and use them to illustrate, develop, and expand results in probability/statistics.

450 (400) Design and Analysis of Algorithms 3 Prereq Cpt S 350, 316; Cpt S major. Analysis of data structures and algorithms; computational complexity and design of efficient data-handling procedures.

455 (401) Programming Language Design 3 Prereq Cpt S 350, 316; Cpt S major. Design concepts of high-level programming languages; syntax and semantics of several existing programming languages; compilers, interpreters, and formal syntax specification.

460 (402) Operating Systems and Computer Architecture 3 Prereq Cpt S 360; Cpt S major. Operating systems, computer architectures, and their interrelationships in micro, mini, and large computer systems.

465 (415) Microcomputer Systems and Programming 3 (2-3) Prereq Cpt S 360; E E 214; Cpt S major. Microcomputer system architectures; microcomputer software; laboratory practice in programming microcomputers.

490 (498) Work-Study Internship V 3-9
May be repeated for credit; cumulative maximum 9 hours. Prereq Cpt S major. By interview only. Experience in programming and systems analysis in a working environment under supervision of industrial or governmental professionals and faculty.

Consulting in Computer Programming 1 May be repeated for credit; cumulative maximum 2 hours. Prereq Cpt S 151, 152, 153, or 154; Cpt S 250, 260; Cpt S major. Consulting for students in Cpt S 151, 152, 153, 154, 250, and 260.

Special Problems V 1-4 May be repeated for credit.

Theory of Computing 3 Prereq Cpt S 316. Discrete structures, automata, formal languages, recursive functions, theory of algorithms and computability.

Complexity of Algorithms 3 Prereq Cpt S 516. Time and space complexity of algorithms; asymptotic optimality; searching, sorting, pattern-matching, and graphs algorithms; parallel algorithms, reducibilities and NP-completeness.

Programming Language Theory 3 Prereq Cpt S 516 or Math 421. Syntax; operational and denotational semantics.

Computational Linear Algebra 3 Same as Math 544.

Advanced Numerical Analysis 3 Same as Math 545.

Topics in Optimization 3 Same as Math 564.

Modeling and Simulation of Ecological Systems 3

Artificial Intelligence 3 Intelligent computer programs; simulation of cognitive processes.

Graphics and Image Processing 3 Prereq Cpt S 455. Raster and vector graphics; 2-D and 3-D representations, transformations and display techniques; antialiasing; image digitizing, transformations, enhancement and display.

Software Development 3 Top-down structured design; validation techniques; large scale software development; programming teams.

Database Systems 3 Prereq Cpt S 316. Data models; file organization and search; database system design.

Compiler Theory and Design 3 Prereq Cpt S 455, 516. Scanning, parsing, code generation, code optimization; theory and practical limitations.

Operating Systems 3 Prereq Cpt S 460. Structure of multiprogramming and multiprocessing; efficient allocation of systems resources; design implementation and performance measurement.

Computer Architecture 3 Prereq Cpt S 460. Computer architecture; processor, memory, input/output and system organizations; pipeline, parallel computing and multi-processing; microprogramming; performance evaluation; distributed computing.

Advanced Topics in Computer Science 3 May be repeated for credit.

Operating Systems Seminar 1

Parallel Processing Seminar 1 May be repeated for credit; cumulative maximum 3 hours.

Computer Science Seminar 1 May be repeated for credit; cumulative maximum 3 hours.

Special Projects or Independent Study Variable credit.

Master's Research, Thesis, and/or Examination Variable credit.

Master's Special Problems, Directed Study, and/or Examination Variable credit.

Doctoral Research, Dissertation, and/or Examination Variable credit.

Course Numbering

The numbering scheme of computer science courses indicates areas of specialization which may be of interest to students. The last two digits of each course number specify this area of specialization: 00-09 indicate service courses for which credit is not granted towards a degree in computer science (e.g., 405); 10-19 indicate courses on the theoretical foundations of computer science; 20-29 indicate courses on computer hardware and digital electronics; 30-39 indicate courses in applied numerical computing; 40-49 indicate computer science courses which do not fit in any ongoing sequence of courses; 50-59 indicate foundation courses in the fundamental areas of computer science; 60-69 indicate courses in systems programming, machine architectures, and operating systems; 70-79 indicate courses in business data processing areas; 80-89 are unused; and 90-99 indicate special projects and internships.

CERTIFICATION REQUIREMENTS

To work towards the Bachelor of Science de-
degree in Computer Science a student must meet formal certification requirements established by the department. Students planning to pursue this degree must complete Cpt S 150, 154, and 250, Math 171 and 172, E E 214, and 3 hours satisfying General University Requirements as a written communication [W] course (e.g., Engl 101). During the semester in which the last of these requirements is being fulfilled the student must formally apply for certification into the Computer Science Department. Application forms may be obtained from the departmental office; the forms must be filled out and turned in to the departmental office no later than the 13th week of the semester. Certification will be based on two factors: (1) the g.p.a. in the required courses listed above, and (2) overall grade point average. The number of students certified each semester will be determined by available positions and resource restrictions. Students will be notified of their certification decision before the start of the subsequent semester to allow for proper advising. Students who are denied may appeal to the head of the department. The appeal must be in writing and submitted to the Computer Science office no later than the Friday of the second week of the subsequent semester. Women and minorities are encouraged to apply. Special consideration will be given to affirmative action candidates.

Schedule of Studies

An undergraduate major is required to complete 39 credits of computer science courses. Twenty-six of these credits must be from courses at the 300 level or above. Required courses are Cpt S 150, 151, 154, 250, 260, 316, 330, 350, 360, and 495; the remaining credits required for the degree may be chosen from any of the course offerings in the department except those ending in digits 00-09 (e.g., Cpt S 405). In addition, students must complete Math 171, 172, 220, and either Stat 443 or Cpt S 435, along with E E 214 and Engl 402. In order to emphasize that computers are not only a source of deep and stimulating intellectual problems but are also machines designed to do useful work, each major is also required to complete 15 credits of coordinated work in an optional area. The optional area must include at least 9 credits of formal course work at the upper-division level. These optional courses are subject to the approval of the student's adviser. They all may be selected from a single department or from a group of related departments. If mathematics is chosen as the optional area the student must complete Math 273 and 9 upper-division credits beyond those already required for the degree in computer science. A grade of C- or better is necessary in all courses used to satisfy the above requirements.

An off-campus work-study internship program involves selected students in seven and one-half months (a summer plus one full semester) of practical work experience with cooperating industries and governmental computer installations. This experience takes place at the beginning of the senior year and is jointly supervised by the computer science faculty and the professional staff of the cooperating installation. A student selected for such an internship will be expected to enroll for 9 credits of Cpt S 490. Only 3 of the 9 credits may be applied towards the 39 credits required for the degree in computer science.

The department also offers an undergraduate minor, which requires the completion of 16 credits in computer science, nine of which must be in formal upper-division work.

Preparation for Graduate Study

As preparation for work toward an advanced degree, students should have completed an undergraduate major in a field in which they have studied significantly complex physical, biological, or social systems, and have taken mathematics at least through elementary calculus and beginning linear algebra. Students should have completed course equivalent to Cpt S 150, 250, 260, 316, 330, and 360. Students who have not been able to acquire an adequate background in computer science may enter the program only after removing this deficiency by completing the above sequence.

Program in Criminal Justice

Associate Professor and Director, B. A. Menke
(for faculty, see Department of Political Science)

The Criminal Justice Program offers a liberal arts education in conjunction with professional studies in the field of criminal justice. The program prepares students for a broad range of careers (law enforcement, corrections, juvenile justice), trains them for pursuit of graduate education, develops leadership qualities, and promotes the ideal of professional achievement in public service.
Program in Criminal Justice

The focus of the program is on the multidisciplinary study of crime and its control. The student is exposed, in addition to general university requirements, to the study of the components, processes, and programs of the criminal justice system. The criminal justice curriculum emphasizes the study of nature of crime and deviance, criminal law, law and social control, the criminal justice process, and administration, management, and research in the criminal justice system.

The student is required to complete a number of collateral courses that focus on the larger social, economic, and political environments in which the criminal justice system operates. These collateral courses, taught by a multidisciplinary faculty, prepare students in such diverse areas as public administration, policy analysis, computer science and research methods. The criminal justice curriculum promotes professional abilities and defines a coherent program of study that creates an awareness of the complex array of forces that are implicated in the genesis and control of crime.

The program offers courses of study leading to the degrees of Bachelor of Arts in Criminal Justice and Master of Arts in Criminal Justice. Students will determine, in consultation with the faculty, the most desirable schedule of studies to achieve their objectives.

Description of Courses

For explanation see Index under "Symbols"

Crm J

101 Introduction to the Administration of Criminal Justice 3 Agencies and process involved in the administration of criminal justice.

150 Organizational Environment of Criminal Justice 3 Prereq Crm J 101. Impact of organizational structures and dynamics on processes of decision making and the performance of criminal justice agencies.

210 Criminal Investigation 3 Prereq Crm J 101. Theory and practice of investigation through application of deductive and inductive reasoning; development and practice of field investigation.

320 Criminal Law 3 Prereq Crm J 101. Substantive criminal law; principles, functions, and limits; basic crime categories, state and national legal research materials.


375 The Philosopher and the Humanist: Their Impact on the Criminal Justice System 3 By interview only. The philosopher and the humanist; early thinkers, social contact thinkers, contemporary thought on totalitarianism and existentialism; assessment of impact on criminal justice.

400 Issues in the Administration of Criminal Justice V 1-3 By interview only. Special issues in criminal justice.

405 Comparative Criminal Justice Systems 3 Prereq Crm J 101. Comparative study of criminal justice systems in the U.S. and selected foreign countries. Credit not granted for both Crm J 405 and 505.

420 Law of Evidence and Criminal Procedure 3 Prereq Crm J 101. Principal court decisions concerning standards of conduct and rights in the criminal process; evidentiary principles and privileges.

425 Law of Corrections 3 Prereq Crm J 101. Impact of federal and state laws, court decisions regarding corrections. (a/y)


470 The Police and Society 3 Prereq Crm J 101. Community and selected social institutional factors as related to their influence on police systems. Credit not granted for both Crm J 470 and 570.

490 Criminal Justice Internship V 10-15 By interview only. Off-campus professional internship in selected criminal justice agencies.

499 Special Problems V 1-4 May be repeated for credit.

500 Seminar in the Administration of Criminal Justice 1 Current issues, problems, and critical concerns within the field of administration of criminal justice.

505 Comparative Criminal Justice Systems 3 Graduate level counterpart of Crm J 405; additional requirements. Credit not granted for both Crm J 405 and 505.

530 Proseminar in Social Control 3 History and evolution of various forms of social control in their institutional and interpersonal forms.

535 Reform Models for Criminal Law 3 Over-reach of the criminal law, pro-
posals for reform in the process of law, legal research.

540 Proseminar in Social Intervention 3 Various models of social intervention with criminal and delinquent offenders; institutionalized intervention, diversion and community based programming.

550 Proseminar in the Administrative Process 3 Processes and techniques of policy making and management within the criminal justice system.

560 Proseminar in Research, Planning and Program Evaluation 3 Social research, strategies of program development, implementation, and evaluation in comprehensive planning in public agencies.

565 Education and Criminal Justice 3 Education and training of criminal justice personnel and the effects of education on crime and criminals.

570 The Police and Society 3 Graduate level counterpart of Crm J 470; additional requirements. Credit not granted for both Crm J 470 and 570.

590 Criminal Justice Field Practicum 6 By interview only. Off-campus professional internship in selected criminal justice agencies.

600 Special Projects or Independent Study Variable credit.

700 Master’s Research, Thesis, and/or Examination Variable credit.

702 Master’s Special Problems, Directed Study, and/or Examination Variable credit.

MINOR IN CRIMINAL JUSTICE

The minor in criminal justice requires 16 credits of coursework in criminal justice, half of which must be taken at the upper-division level. Students wishing to declare a minor in criminal justice should contact the Department of Political Science for details.

Schedule of Studies

Students who major in Criminal Justice must complete the 12 credit criminal justice core (Crm J 101, 150, 320, 470) plus an additional 12 credits of criminal justice electives; 21 of the 24 criminal justice credits must be taken in graded coursework. In addition, the student must complete several collateral courses as outlined below. At least 40 of the total hours required for the bachelor’s degree in this program must be in upper-division courses.

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Crm J 101</td>
<td>3</td>
</tr>
<tr>
<td>Engl 101*</td>
<td>3</td>
</tr>
<tr>
<td>Science (physical or biological, lab) *</td>
<td>4</td>
</tr>
<tr>
<td>Psych 102*</td>
<td>3</td>
</tr>
<tr>
<td>Communication GUR</td>
<td>3</td>
</tr>
<tr>
<td>Soc 101*</td>
<td>3</td>
</tr>
<tr>
<td>Pol S 101*</td>
<td>3</td>
</tr>
<tr>
<td>Humanities GUR</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Sophomore Year</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crm J 150</td>
<td>3</td>
</tr>
<tr>
<td>Phil 101 or 260*</td>
<td>3</td>
</tr>
<tr>
<td>Foreign Language*</td>
<td>8</td>
</tr>
<tr>
<td>Science (physical or biological, lab) *</td>
<td>4</td>
</tr>
<tr>
<td>Cpt S 140*</td>
<td>3</td>
</tr>
<tr>
<td>Science Elective</td>
<td>1</td>
</tr>
<tr>
<td>Electives</td>
<td>8</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Junior Year</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crm J 320</td>
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<tr>
<td>Crm J Electives</td>
<td>6</td>
</tr>
<tr>
<td>Soc 320</td>
<td>3</td>
</tr>
<tr>
<td>Soc 361*</td>
<td>3</td>
</tr>
<tr>
<td>Pol S 300* or 402; Soc 364*</td>
<td>6</td>
</tr>
<tr>
<td>Minorities Studies*</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Senior Year</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crm J 470</td>
<td>3</td>
</tr>
<tr>
<td>Crm J Electives</td>
<td>6</td>
</tr>
<tr>
<td>Pol S 404</td>
<td>3</td>
</tr>
<tr>
<td>Pol S 416</td>
<td>3</td>
</tr>
<tr>
<td>Pol S 440</td>
<td>3</td>
</tr>
<tr>
<td>Soc 461</td>
<td>3</td>
</tr>
<tr>
<td>Electives</td>
<td>9</td>
</tr>
</tbody>
</table>

Review the GURs and College of Science and Arts requirements in this bulletin. Students who complete the above Schedule of Studies will have met all General University, College of Sciences and Arts, and Criminal Justice requirements (with the exception of the required 40 upper-division credits).

*Course must fulfill a General University Requirement or requirement for the College of Science and Arts.

Transfer Students

Students planning to transfer to Washington State University at the end of the freshman or sophomore year should follow as closely as possible the general and core course requirements set forth above. If this is done, there should be no difficulty in completing the requirements for the bachelor’s degree within the normal period of four years. It should also be noted that courses numbered 300 or
above at Washington State University and
taken at other institutions during the freshman or sophomore years will not be accepted
for major requirements.

**Preparation for Graduate Study**
Undergraduates who are pursuing their studies at other institutions or through other curricula
at this institution and who contemplate graduate work in this department will do well to
elect courses similar to those required in the
above schedule of studies.

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## Program in East and South Asia

*Associate Professor and Director, F. W. Blackwell (South Asia); Professors, T. Akamine (Education, East Asia), V. N. Bhatia (International Programs, South Asia), D. H. Bishop (Philosophy, Asia General), A Chang (Chinese, Japanese), T. L. Kennedy (History, East Asia),
T. Tsunotani (Political Science, East Asia), Professor Emeritus A. H. Smith (Anthropology, East Asia); Associate Professors, J. T. Donnelly (Economics, Developing Countries), D. A. Messerichmidt (Anthropology, South Asia), A. S. Richarz (Child & Family Studies, Developing Countries); Assistant Professors, W. M. Joering (Economics, Developing Countries); T. Mehta (Nutrition, South Asia);
G. Nomura (History, East Asia); Librarians, R. Kuo (East Asia), A. M. Spitzer (South Asia).*

The Program in Asian Studies is designed to
provide a broad, systematic knowledge of Asia
through interdisciplinary study and is intended
to serve four major objectives:

1. to prepare student intending to teach
courses on Asia in public schools,
2. to provide academic background for those
planning to pursue graduate work on
Asia,
3. to prepare students for business careers
dealing with Asia, and
4. to train those interested in government-
al and various private career opportunities
related to Asia.

The flexibility of the program affords both
an area concentration and a departmental
specialization. The program offers the degree of Bachelor of Arts in Asian Studies.

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## Description of Courses

*For explanation see Index under "Symbols"*

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>270</td>
<td>[S] Introduction to South Asian Culture 3 Same as Hist 270.</td>
</tr>
<tr>
<td>275</td>
<td>[S] Introduction to East Asian Culture 3 Same as Hist 275.</td>
</tr>
<tr>
<td>303</td>
<td>Elementary Hindi 4 Same as For L 303.</td>
</tr>
<tr>
<td>304</td>
<td>Elementary Hindi 4 Same as For L 304.</td>
</tr>
<tr>
<td>310</td>
<td>[H] Eastern Civilization and Literature 3 Same as For L 310.</td>
</tr>
<tr>
<td>315</td>
<td>[H] Philosophy and Religion of China and Japan 3 Same as Phil 315.</td>
</tr>
<tr>
<td>352</td>
<td>[H] Literature and Lore of South Asia 2 Same as For L 352.</td>
</tr>
<tr>
<td>374</td>
<td>[H] Pre-Modern History of East Asia 3 Same as Hist 374.</td>
</tr>
<tr>
<td>420</td>
<td>Peoples of Asia 3 Same as Anth 420.</td>
</tr>
<tr>
<td>435</td>
<td>Politics of Developing Nations 3 Same as Pol S 435.</td>
</tr>
<tr>
<td>436</td>
<td>Comparative Politics: China and Japan 3 Same as Pol S 436.</td>
</tr>
<tr>
<td>470</td>
<td>India 1926-1947 3 Same as Hist 470.</td>
</tr>
<tr>
<td>471</td>
<td>Contemporary South Asia 3 Same as Hist 471.</td>
</tr>
<tr>
<td>475</td>
<td>Twentieth Century East Asia 3 Same as Hist 475.</td>
</tr>
<tr>
<td>476</td>
<td>Revolutionary China, 1800 to Present 3 Same as Hist 476.</td>
</tr>
<tr>
<td>477</td>
<td>Modern Japanese History 3 Same as Hist 477.</td>
</tr>
<tr>
<td>499</td>
<td>Special Problems V 1-4 May be repeated for credit.</td>
</tr>
</tbody>
</table>

## Degree Requirements

**MAJOR:** A minimum of 42 hours of courses on Asia and in related fields including (1) two
years of an Asian language or languages and
(2) at least six hours in both East Asia and
South Asia, which must include the core
courses of As St 270 and 275. Of the total
42 hours, at least 36 must be at the 300 level
or above. Also required is a minor (or second
major) in a discipline (i.e., department) or
a program (e.g., Asian American Studies, Re-
ligious Studies).

**MINOR:** Students wishing to minor in Asian Studies should see the Program Director for
requirements.

<table>
<thead>
<tr>
<th>East Asia</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anth 323 Peoples of East Asia</td>
<td>3</td>
</tr>
<tr>
<td>As St 275 Intro East Asia</td>
<td>3</td>
</tr>
<tr>
<td>As St 315 Phil of China, Japan</td>
<td>3</td>
</tr>
</tbody>
</table>
The curriculum in economics is designed to serve all students interested in the study of economic relationships in the national and world economy. Some knowledge of economics is generally regarded as a useful supplement to the course work for all fields. The course of study for economic majors is sufficiently flexible to accommodate students with a variety of career interests, including business, law, government, education, public administration, and general economics. The undergraduate economics major is also excellent preparation for graduate study in many fields, such as business, law, and economics. Courses of study in economics allow sufficient time for electing courses outside the department while meeting all departmental and General University Requirements.

The department offers courses of study leading to the degrees of Bachelor of Arts in Economics, Master of Arts in Economics, and Doctor of Philosophy.

**Description of Courses**

For explanation see Index under "Symbols"

**Econ**

102 [S] Fundamentals of Macroeconomics

V 3-4 Theory and policy related to unemployment, inflation, foreign trade, government spending, taxation, and banking. Credit not granted for both Econ 102 and 201.

198 [S] Economics Honors 3


203 [S] Fundamentals of Microeconomics

V 3-4 Theory and policy related to business competition, industrial organization, investment, income distribution.

301 Theory of the Firm and Market Policy 3 Prereq Econ 203, and 102 or 201. Price determination and market behavior under different market structures and the problems posed for public policy.

312 Economics of Consumption 3 Prereq Econ 203, and 102 or 201. Consumption expenditures and problems; theory of consumer choice; public policy and consumer welfare.

316 Urban and Regional Economics 3 Pre-
req Econ 301. Industry and population location within and among regions; city structure; growth and stagnation problems and policies of cities and regions.

320 Money and Banking 3 Prereq Econ 102 or 201. Principles of money, credit, banking, and national income analysis.

325 Women and Minorities in the Economy 3 Prereq Econ 102, 201, or 203. Economic experiences of minorities and women within American society.

340 Public Finance and Taxation 3 Prereq Econ 102 or 201. Theory and practice at local, state, and federal levels.

350 Labor Economics and Problems 3 Prereq Econ 301, and 102 or 201. Functioning of labor markets; introduction to collective bargaining and labor law.

360 Government and Business 3 Prereq Econ 203. Regulations of utilities, transportation, banks, communications; antitrust law; protection of industries, consumers, environment, workers safety and rights.

364 Transport Economics 3 Prereq Econ 301. Characteristics of transportation systems; market structure; case for and progress of public control of transport agencies.

381 Energy Economics 3 Prereq Econ 201 or 203. Descriptive and analytical treatment of economics and environmental aspects of energy; formation of National Energy Policy.

401 Intermediate Macroeconomic Analysis 3 Prereq Econ 320. Introduction to income, employment, and inflation theory with policy implications.

402 History of Economic Thought 3 Prereq Econ 102 or 201. Development of economic thought; classical and neoclassical schools, forerunners, and critics considered in relation to their historical setting.

408 Mathematics for Economists 3 Same as Math 408.

410 Elements of Mathematical Economics 3 Prereq Econ 301; Math 202. Neoclassical economics and related subjects using the calculus as the primary analytical tool.

411 Introduction to Econometrics 3 Prereq Math 201; QMeth 215; Econ 301. Econometric methods in relation to the substantive achievements of empirical econometrics.

416 Comparative Economic Systems 3 Prereq Econ 203 or 201. Key institutions, policies, and economic performance of capitalist and socialist systems; U.S., France, Japan, Sweden, Yugoslavia, Soviet Union, Poland, China.

420 Monetary Theory and Policy 3 Prereq Econ 320. Current issues in monetary economics with a special emphasis on policy.

430 American Economic History 3 Prereq Econ 301 and 102 or 201. Development and changes in the American economy from the colonial period to the present.

431 European Economic History 3 Prereq Econ 203 and 102 or 201. Development and changes in the European economy from prehistorical times to the present.

440 Fiscal Policy 3 Prereq Econ 320, 340. Theoretical and empirical impacts of public expenditure and taxes on the economy; recent changes in fiscal policy theories.

445 Economic and Business Fluctuations 3 Prereq QMeth 215; Econ 320. Business conditions and outlook analysis; explanations of economic fluctuations.

450 Collective Bargaining 3 Prereq Econ 350. Legal status, current attitudes, and specific collective bargaining agreements with some emphasis given to Pacific Northwest industries.


460 Concentration of Corporate Power and Antitrust Policy 3 Prereq Econ 301, and 102 or 201. Extent, causes, and effects of economic power held by U.S. corporations; antitrust laws and other legislation regulating business practices.

463 Urban Transportation Economics 3 Prereq Econ 301, 364. Applications of basic microeconomics to urban transportation problems, urban transportation demand analysis, supply analysis, and system investment decision-making.

464 Freight Transportation Economics 3 Prereq Econ 364; QMeth 215. Analysis of the market structure, conduct and performance of the intercity freight transportation industry using microeconomic theory and basic statistical tools.

468 Public Utility Economics 3 Prereq Econ 201 or 203. Economics and legal concepts; development of utility industries and regulation, pricing, and investment
standards; public projects and other development programs.

470 International Trade and Finance 3 Prereq Econ 301, and 102 or 201. Analysis and description of international specialization; commercial policy; multinational firms, monetary problems.

472 Economic Development and Underdevelopment 3 Economic development and underdevelopment in low-income countries, development theories, policies, strategies, and country models; imperialism and economic dependency.

499 Special Problems V 1-4 May be repeated for credit.

500 Macroeconomic Analysis 3 Prereq Math 201; Econ 401. General equilibrium theories of inflation and unemployment; consumption, investment and money demand functions; monetary and fiscal policy.

501 Macroeconomic Theory 3 Prereq Econ 301; one year calculus or Math 408. Static optimization; theory of the consumer and the firm; markets and resource allocation.

502 Advanced Macroeconomic Theory 3 Prereq Econ 500. Mathematical macro general equilibrium and disequilibrium.

503 Advanced Microeconomic Theory 3 Prereq Econ 501; Math 408. Contemporary developments in micro theory and policy. Continuation of Econ 501.

504 History of Economic Thought 3 Evolution of economic theory and thought in historical context; classical and neoclassical contributors, precursors, and critics.

505 Microeconomics for Decision Making 4 Prereq Math 201, 202. For MBA and other master's-level students with limited training in microeconomics.

510 Mathematical Models of Economics 3 Prereq Econ 503; Math 408. Exposition of the mathematical structure of economic theories; the unity of mathematical theorems underlying modern developments.

511 Econometrics 3 Prereq Ag E 510; Econ 411. Use of mathematical, economic, and statistical research as a means of testing economic theories.

512 Applied Econometrics 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Econ 411, 501; Math 408. Practical economics; executing empirical research; use of computer programs; current empirical work.

520 Seminar in Monetary Economics 3 Prereq Econ 420. Analysis of money demand models, money supply models, and the role of money in a modern economy.

530 Economic History 3 May be repeated for credit; cumulative maximum 6 hours. Changes in the American economy; introduction to the New Economic History.

540 Advanced Public Finance 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Econ 340. Philosophies of taxation; economic effects of specific taxes; state and local financial problems; education, highways, and state and city government.

552 Labor Theory 3 May be repeated for credit; cumulative maximum 6 hours. Developments in labor theory; wage theory and recent journal literature.

560 Seminar in Industrial Organization 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Econ 460. Industrial organization, market conduct, and performance; appraisal of antitrust legislation.

564 Transportation Theory and Policy 3

568 Public Utility Theory and Policy 3

570 International Economics 3 The basic nonmonetary theory; new theories of international trade; tariffs and commercial policy; effects of economic integration; international movements factor.

571 Monetary Aspects of International Economics 3 Balance-of-payments accounting; methods of adjustment to payments imbalance; the foreign exchange market; international financial institutions.

572 Theoretical and Institutional Aspects of Economic Development 3 Selected topics in the political economy of developing nations.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

CERTIFICATION REQUIREMENTS
To be eligible to certify as a major in Economics, a student must have earned at least
40 semester hours of credit on graded course work and at least 6 hours of economics core courses, and meet current standards of (1) cumulative g.p.a., and (2) g.p.a. based on at least 9 hours economics core courses. Contact the department for complete details; current standards are also published each fall in the Catalog Supplement.

Schedule of Studies

During the freshman and sophomore years the Econ major should normally begin Econ courses and complete a major portion of the General University Requirements. In the junior and senior year the Econ major may choose from a variety of courses to prepare for employment or postgraduate education. Majors must complete courses in the following areas:

Core: Econ 102 and 203 or 201 (198 for honor students) and 203; 301; 401; 402, 403, or 431.

Fields: 18 hours of Econ area courses of which at least 9 hours must be at the 400 level.

Math: Option A: Math 171 and 220
Option B: Math 201 and 202

Quantitative Methods: Option A: QMeth 215 and Econ 311 or 411
Option B: Stat 443 and 444

Related Work: 12 hours from courses outside Econ, typically in Ag Ec, BA, Computer Science and the Social Sciences.

\(^1\)May not be used as GUR courses.

Minor in Economics

A minor in economics is often a desirable complement to majors such as business administration, engineering, education, agricultural economics, forestry, political science, and history. A minor in economics is offered to students who complete 18 hours of economics. At least 12 hours must be in the department's core courses. Consult the department for an acceptable program of study.

SPECIAL PROGRAMS OF STUDY

Students planning to begin a career immediately after graduation will find openings in many areas of business and government. Special programs of study for particular areas can be developed with the departmental advisers.

Students planning graduate study, whether in economics, law, business or public administration, are advised to develop skills through courses in English composition and additional work in statistics. Recommendations for specific graduate areas include:

Law School: B Law 210; Accmg 230; Pol S 300; and, depending on legal interests, elective Econ courses from the following: Econ 340, 364, 450, 451, 460, 468 and 470. B Law 410, 411 suggested.

Business School: Accmg 230; Cpt S 201, 210 or 220. Additional courses in BA are not required for admission to most graduate schools of business. It might be useful, however, to take a second course in accounting, Accmg 231, and to take introductory courses in the major areas of business: B Law 210, Mktg 301, 360, Fin 325, Mgt 340.

Economics: Math 220 and 171 are recommended to satisfy the major's math requirements. Calculus through Math 273 and Econ 408 may also be useful.


After the first two courses students will apply their knowledge of basic economic principles to more specialized subjects: money and banking; business fluctuations; federal, state, and local finance; taxation; labor and collective bargaining, transportation and public utility economics; international trade and finance; government regulation and control of business; economic history; economic theory.

Transfer Students

Students planning to transfer into economics by the end of their sophomore year should have completed the introductory economics courses if they plan to complete the required work for a degree in two additional years.

Preparation for Graduate Study

Students interested in graduate study should have the approximate background of the undergraduate major shown above. However, students with supporting work in related areas may enter into graduate study with somewhat less training in economics. Such students are requested to communicate with the department for advice and assistance in the development of their plans.
Department of Education


The Department of Education, accredited by the National Council for Accreditation of Teacher Education, prepares teachers, school administrators, and other specialists for schools and colleges.

The teacher-education program combines college courses, laboratory instruction, and opportunity to observe and work with children in the public schools. Faculty advisers consult with each student to help plan a program that best fits individual abilities and objectives.

The department offers courses of study leading to the degrees of Bachelor of Arts in Education, Bachelor of Arts in Industrial Technology, Bachelor of Science in Agricultural Education, Master of Education, Master of Arts in Education, Doctor of Education, and Doctor of Philosophy.

Admission

1. A student may make application for admission to the Department of Education after having earned at least 30 hours credit. The student must be accepted as an education major (elementary) or as a double major (secondary) in education before taking any education courses. Application forms may be secured from the department.

2. An overall C average, a C average in all education courses, and a C average in the teaching major or the combined teaching major and minor are required for admission to and continued enrollment in the department.

3. Admission or continuing enrollment may be denied an education major on the basis of review by the department.

4. Applicants for the Provisional Certificate who have a bachelor's degree from an accredited institution other than Washington State University must complete the teacher-education program and earn not less than 30 semester hours in residence. They shall apply for admission to the university to work toward a teaching certificate, usually as a Class 5 in the Graduate School.

5. Applicants who have had one or more years of experience as teachers and who wish to work for a Standard Certificate shall apply for admission to the Graduate School as a Class 5. Those who wish to prepare for supervisory or administrative positions in the schools shall apply for admission to the Graduate School to pursue the particular program.

Preparation for Teaching Certificates

Provisional Certificates—A Four-Year Program

Under the authority of the laws of the state of Washington and the regulations of the State Board of Education, Washington State University grants a Provisional Certificate to all candidates who meet the United States citizenship requirements of Washington certification, who have the personal qualifications to teach, and who meet the specified requirements. The certificate is valid for three years, the first year of which will be limited by the university as to grade level and subject matter, and may be renewed for a period of three years thereafter to teach in the public school of the state.

Students in agricultural education are referred to Agricultural Education for their certification requirements which vary somewhat from the program described later in this section.

Students in Home Economics Education are referred to Home Economics Education for certification requirements which vary in instances and certification needs to be coordinated with vocational certification.

Application for issuance of a Provisional Certificate should be submitted to the Department of Education prior to the beginning of the student's senior year.

Standard Certificate and the Fifth Year of Preparation

Experienced teachers may be recommended by Washington State University to the State Su-
perintendent of Public Instruction for the Standard Certificate. Candidates for the certificate shall meet specific requirements dependent upon their present certificate status. The Standard Certificate is valid as long as the individual remains in the teaching profession and for a period of seven years thereafter.

Holders of the Provisional Certificate may be recommended for a Standard Certificate upon completion of three years of successful teaching experience and an approved fifth-year college program of studies (30 semester hours). A maximum of 10 semester hours of preteaching credit will be permitted on a fifth-year program at Washington State University. Additional preteaching credits may be approved in certain cases if they are a part of a planned fifth-year program. The fifth year of study, which should be planned with the recommending institution, provides an opportunity for specialization and to strengthen teaching competence. General regulations for the fifth year of study, which may be completed in summer sessions or in an academic year, may be secured from the Department of Education.

**ESA Counselor Certification**
The Department of Education at Washington State University is involved with Southeastern Washington school districts in a Counselor Education Consortium. This consortium directed program has been approved by the State Board of Education and is a program of preparation leading to the certification of school counselors.

Further information may be obtained from the Department of Education counselor education faculty or officers of the consortium.

**ESA Communication Disorders Certification**
A program leading to ESA certification as a communication disorders specialist in the public schools is offered by the Department of Speech.

**ESA Reading Resource Specialists**
The Department of Education at Washington State University in association with the Eastern Washington Reading Resource Specialist Consortium has an approved program for the preparation of Reading Resource Specialists. This program requires that the applicant complete a master's degree and pass competency review which is conducted by the consortium. Further information may be obtained from Dr. Jerry L. Milligan, consortium member and WSU faculty member.

**Preparation for Administrators and Other Specialists**
The Department of Education in cooperation with other departments offers graduate training in the fields of education administration, curriculum and media, guidance and personnel, elementary education, community college and higher education, educational psychology, reading, and vocational technical education.

The Department of Education is authorized by the State Board of Education to prepare candidates for principals, program administrators, and superintendents' credentials for the state of Washington. Requirements for the various credentials may be secured from the Department of Education. Application for the desired credential should be made to the Department of Education after at least one year of teaching experience and prior to entering a program of preparation. Applicants must meet the same Graduate School admission requirements as graduate degree candidates.

**University Reading/Study Skills Center**
The University Reading/Study Skills Center, located in Cleveland 242, offers students assistance in such areas as notetaking, organization of time for study, vocabulary and comprehension development, study reading, and test taking. Students who desire help in these areas should register for Educ 100. (See Education course descriptions.)

**Transfer Students**
Education majors are required to complete in residence at least one-half of the total hours required in professional education for the Provisional Certificate.

**Course of Study**
The State Board of Education has established guidelines and standards for teacher-preparation programs. All Provisional Certificates recommended by the Department of Education at Washington State University meet these standards.

The Provisional Certificate is limited as to grade level and subject-matter preparation for the first year of teaching. Each student will prepare to teach at one of three levels: elementary school, junior high school, or senior high school, and plan a program in accordance with the requirements of the preferred level. Those who wish to be certified to teach at more than one of the three levels should plan...
their programs with an education adviser as they will be expected to complete more than the minimum requirements listed below for any one level of preparation.

The following professional laboratory experiences are provided:

1. Educ 300 is required and is a prerequisite to Directed Teaching. The student participates in daily activities during the first two weeks of a public school term in September and attends orientation lectures. Arrangements are made for this experience with the Coordinator of Student Personnel Services in the Department of Education.

2. In Educ 303, 305, and 320 all students participate in required directed observations in public school classrooms one-half day per week.

3. Educ 405 or 406, Directed Teaching consists of approximately nine weeks of full-time participation in the teaching program of a public school. The directed teaching semester consists of especially planned half-semester courses. It is not possible to enroll in regular full-semester courses during that time.

Requirements for the Provisional Certificate

Elementary School Preparation
1. General Education and General University Requirements for Graduation: 28 hours.
   - 6 hours of communication proficiency; 6 hours of arts and humanities; 6 hours of social sciences including Psych 102; 10 hours of science including one credit in laboratory and including Math 105 and 300.

2. Professional Education and Professionalized Subject-Matter Minor: 43 hours

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<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tr>
<td>Educ 300 Intro Field Trip</td>
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<tr>
<td>Educ 301 Edu Psych</td>
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<td>*Educ 304 El SS Sci Math</td>
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<td>*Educ 305 El SS Sci Ma</td>
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<td>Educ 306 El Rdnig &amp; La</td>
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<td>Educ 307 Sur Chil Lit</td>
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<td>Educ 320 El Read MFra</td>
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<td>*Educ 390 Elem Art Ed</td>
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<td>Educ 401 Eval Rdnig E</td>
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<td>Educ 403 or 404 Curriculum</td>
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<td>Educ 405 or 406 Dir Teaching</td>
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<td>*H Ed 480 or 481 Sch Hth Prog</td>
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<td>*Mus 388 Mus for Tchr</td>
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<tr>
<td>*PEP 379 or 380 Elem or Inter</td>
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3. Subject-Matter Preparation: approximately 30 hours. The student will select a teaching major of approximately 30 semester hours from the elementary school majors listed in this section of the catalog.

4. Degree: Those who are preparing to become elementary teachers will be granted a Bachelor of Arts degree in Education provided they meet the General University Requirements for Graduation and the program for elementary school preparation as determined by the department. They will certify their majors in education as soon as possible after earning 30 hours of credit but before they enroll in any education courses, they will then be assigned an adviser in the Department of Education.

*Required professionalized subject-matter minor courses.

Junior High School Preparation
1. General Education: approximately 45 semester hours including H Ed 480 or 481; Psych 102; and courses used to meet the General University Requirements for Graduation for the bachelor's degree (see item 4 below).

2. Professional Education: 28 semester hours

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<tr>
<th>Course</th>
<th>Hours</th>
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<tr>
<td>Educ 300 Intro Field Exp</td>
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<td>Educ 301 Edu Psych</td>
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<tr>
<td>Educ 303 Teach Sec Sch</td>
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<tr>
<td>Educ 358 or 359 Curr Issues</td>
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<td>Educ 402 Eval Rdnig E</td>
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<tr>
<td>Educ 403 or 404 Curriculum</td>
<td>3</td>
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<tr>
<td>Educ 405 or 406 Dir Teaching</td>
<td>10</td>
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<tr>
<td>Educ 450 or 451 Tch Rdg Cont</td>
<td>2</td>
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3. Subject-Matter Preparation: approximately 45 semester hours. The student will select a teaching major of approximately 30 semester hours and a teaching minor of approximately 15 semester hours from the junior high school majors and minors listed in this section of the catalog. The junior high candidate may select one of the following combinations of major and minor:
   - Social Studies (language arts minor), Language Arts (social studies minor), Biological Science (physical science minor), Physical Science (biological science minor), Mathematics (physical or biological science minor). The following majors would be acceptable, providing the major is combined with a strong, unrelated minor field: fine arts, foreign language, in-
Industrial education, music, and physical education.

4. Degree: Students preparing to become junior high school teachers will secure their degrees in one of the subject-matter departments of the university or in General Studies. They will certify as a double major in both the degree department and the Department of Education before they take any education courses. They will have advisers in both departments.

High School Preparation

1. General Education: approximately 45 semester hours including H Ed 480 or 481; Psych 102; and courses used to meet the General University Requirements for Graduation for the bachelor's degree (see item 4 below).

2. Professional Education: 26 hours

   Hours
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   Educ 300 Intro Field Exp 1
   Educ 301 Educ Psych 4
   Educ 303 Teach Sec School 4
   Educ 358 or 359 Curr Issues 2
   Educ 402 Eval Lang Sec 2
   Educ 403 or 404 Curriculum 3
   Educ 405 or 406 Dir Teaching 10

3. Subject-Matter Preparation: approximately 45 semester hours. The student will select a teaching major of approximately 30 semester hours and a teaching minor of approximately 15 semester hours from the high school majors and minors listed in this section of the catalog. In a few specific fields, 45-hour majors are indicated and no minor is required.

4. Degree: Students preparing to become senior high school teachers will secure their degrees in one of the subject-matter departments of the university or in General Studies. They will certify as a double major in both the degree department and the Department of Education before they take any education courses. They will have advisers in both departments.

Description of Courses

<table>
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<tr>
<th>Education courses may be taken by certified Elementary or Secondary Education majors only.</th>
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For explanation see Index under "Symbols"  
Educ 100 Reading Efficiency and Study Skills 1-2

May be repeated for credit; cumulative maximum 2 hours. Strategies to augment such student capabilities as vocabulary, comprehension, rate flexibility, notetaking, test-taking, and study skills.

200 Careers in Chicanos Studies and Bilingual Education 2 Same as Ch St 200.

300 Introductory Field Experience 1 Supervised field experience for preservice teachers designated as an orientation to education and the opening of school.

301 Educational Psychology 4 Prereq Psych 102; Educ 300. Not open to freshmen or first semester sophomores. Theories and principles of psychology applied to teaching; human development, learning, motivation, and social/emotional adjustment of students.

303 Teaching in Secondary Schools 4 (3-3) Prereq Educ 300, 301. Materials and general methods for teachers; observation to be scheduled in a 3-hour block once a week.

304 Elementary Mathematics, Science, Social Studies 1 3 Prereq Educ 300, 301, Math 300 or C//. Scope and sequence of content in elementary and middle school science, social studies, and mathematics.

305 Elementary Mathematics, Science, Social Studies II 1 3 (2-3) Prereq Educ 304. Teaching methods in elementary and middle school mathematics, science, and social studies; observations and teaching in the public schools.

306 Survey of Elementary Reading and Language Arts 4 Prereq Educ 301. An introductory survey course focusing on the attitudes, knowledge, and skills needed for successful teaching of reading and language arts.


308/309 Teaching Writing in the Elementary Schools 2 (1-3) Prereq Educ 301 or C/-. For preservice elementary teachers. Improving writing skills; preparing effective writing lessons.

310 Reading Materials for Adolescents 3 Selection, evaluation, and use of reading materials for adolescents.

320 Elementary Reading Methods 3 (2-3) Prereq Educ 306, 307. Methods and materials for teaching reading in ele-
lementary school; classroom observation and participation.

322 Topics in Student Personnel Work 2 or 3 Educational psychology, theories of human behavior, and legal and ethical considerations related to student personnel work.

329 Seminar in Contrastive Linguistics: Spanish-English 3 Same as Ch St 329.

335 Bilingual Methods in the Classroom: Social Science, Science, Mathematics 3 Same as Ch St 335.

358 Communication, Cultures, and Careers 2 Prereq Edu 303. Social, psychological multicultural issues: human relations, ethnic concerns, sexism, career education; teaching responsibilities.

359 Communication, Cultures, and Careers 2 Same as Edu 358.

389 Art Mediums 3 (0-6) Same as F A 389.

390 Elementary School Art Education 2 (1-3) Prereq Edu 301. Creative methods for utilizing art media in the elementary classroom.

401 Evaluation of Learning, Elementary 2 Prereq Edu 305 or 320. Theory and methods of evaluating pupil progress in the elementary schools.


403 Social Foundations of Curriculum 3 Prereq Edu 303 or 320; c/ / in directed teaching. Public school curriculum.

404 Social Foundations of Curriculum 3 Same as Edu 403.

405 Directed Teaching V 8 (1-21) to 12 (1-33) May be repeated for credit. Prereq Edu 303 or 320, 300; senior standing. By interview only. Supervised teaching in public schools (full day for one half-semester). Includes a 2-hour weekly seminar in problems of teaching.

406 Directed Teaching V 8-12 Same as Edu 405.

410 Ethnic Groups and Public Education 2 or 3 Resources concerning ethnic groups in public education; relating curriculum and teaching to cultural backgrounds; current issues.

411 Bilingual Methods in the Classroom: Reading and Language Arts 3 Prereq Edu 306; Ch St 529. Seminar on reading and language arts for the bilingual-bicultural classroom; second language learning, teaching, and Spanish reading methods.

430 Innovations in Reading 2 Prereq Edu 320 or 450/451. Aspects of teaching reading beyond basic methods course; individual diagnosis; current programs and trends; activities and materials for enrichment. Credit not granted for both Edu 430 and 530.

431 Innovations in Reading 2 Same as Edu 430. Credit not granted for both Edu 431 and 531.

432 Children's Literature in the Curriculum 2 Prereq Edu 305, 320 or teaching experience. Role, models, utilization of trade books and story-telling in language experience and individualized reading, content areas, and creative expression. Credit not granted for both Edu 432 and 532.

433 Children's Literature in the Curriculum 2 Same as Edu 432. Credit not granted for both Edu 433 and 533.

434 Introduction to Guidance 2 or 3 Prereq 12 hrs Educ. Guidance: history, philosophy and services. Credit not granted for both Edu 434 and 534.

435 Introduction to Guidance 2 or 3 Same as Edu 434. Credit not granted for both Edu 435 and 535.

445 Preparation and Utilization of Audio-Visual Materials 2 (1-3) or 3 (2-3) Prereq 6 hrs Educ. Sources and evaluation of materials; practice in techniques with materials and equipment.

446 Preparation and Utilization of Audio-Visual Materials 2 (1-3) or 3 (2-3) Same as Edu 445.

447 Designing Personalized Instructional Materials 2 (1-3) or 3 (2-3) Prereq 6 hrs Educ. Relating all media to the instructional process; development and production of learning activities package, television lesson and basic photography project.

450 Teaching Reading in the Content Areas 2 or 3 Prereq Edu 303 or c/ / . Development of reading and study skills; demands of various content areas and implementation.

451 Teaching Reading in the Content Areas 2 or 3 Same as Edu 450.

452 Content Area Reading and Study Skills Practicum V 1-3 May be repeated for credit; cumulative maximum 3 hours. Prereq Edu 320 or 450. Development and delivery of vocabulary, comprehen-
sion, and study skills under supervision of Reading Center staff.

455 Education of Exceptional Children 3
Prereq 12 hours Educ. Classification, developmental characteristics, and etiology of exceptional children; research and methods of instruction in the classroom.

456 Seminar on Mental Retardation 2
Prereq Educ 455. Education of retarded children; legal, educational, and social problems associated with education of the retarded.

462 Corrective Reading in the Classroom 2
Prereq Educ 320. Investigation, formulation, application of informal and formal assessment for classroom grouping and instruction; specific skill needs of learning-delayed readers.

463 Corrective Reading in the Classroom 2
Same as Educ 462.

464 Analysis and Management of Exceptional Behavior 3
(2-3) Prereq Educ 301, 455. Intervention strategies and continuous progress measurement systems for dealing with academic, social problems in education settings. Credit not granted for both Educ 464 and 564.

478 Career Development and Vocational Guidance for the Handicapped 3
Prereq major in College of Educ. Concepts of career development and vocational guidance and counseling related to the needs of the handicapped.

481 Vocational Education Methods in Secondary Special Education 3
Prereq major in College of Educ. Specific techniques, strategies, and materials for working with handicapped young and adults.

485 Social Studies in the Contemporary School 2
Prereq junior standing. Bases, scope, and sequence of the social studies curriculum; problem analysis of timely issues.

486 Social Studies in the Contemporary School 2
Same as Educ 485.

490 Instructional Practicum V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 8 hours.

491 Education and Social Change in Africa 3
Same as BI St 491.

492 Designing Art Programs for the Public Schools 3
Prereq Educ 390, secondary arts major, or teaching experience. Preparation of preservice and in-service educators in the development of art programs (K-12) responsive to current needs and trends.

499 Special Problems V 1-4 May be repeated for credit.

500 Foundations and Issues of American Education 3
Open to non-majors. Development, scope, and main issues of public education in the U.S.

501 Philosophy of Education 3
Development of American educational philosophy.

502 Advanced Educational Psychology 3
Prereq Educ 301. The interpretation of fundamental psychological facts, theories, and principles applying to education.

504 Seminar in the History of Education, 1860 to Present 3
Liberal and revisionist interpretations of the emergence of the present U.S. educational organization and attendant issues.

505 Introduction to Educational Research and Evaluation 3
Prereq teaching experience. Basic concepts, principles, and procedures in planning and conducting educational research.

507 Social Foundations of Education 3
Educational adaptations to the economic and social trends and forces.

508 Educational Statistics 3
Prereq Educ 401 or 402. Descriptive statistics: central tendency, variability, correlations, and regressions; introduction of tests of significance; reporting and interpreting educational research data.

509 Educational Measurements 2 or 3
Prereq Educ 508. Theory and use of standardized educational measurement devices; intelligence, aptitude, and achievement tests.

510 Improvement of Instruction 3
Prereq teaching experience. Analysis and evaluation of instructional models with emphasis on information processing; implications for changing teaching style.

511 Teaching Poetry to Children and Young People 3
Prereq Educ 303 or 397 or teaching experience. Elements and forms of poetry for children and young people; selection and utilization in the school curriculum. (a/y)

512 Secondary School Curriculum 3
Prereq teaching experience. Current approaches to problems and issues in secondary school programs.

513 Seminar in Middle School Education 3
Prereq teaching experience. Curriculum
patterns and recent research regarding instruction and materials in the contemporary middle school.

514 Basic Principles of Curriculum Design 3 Prereq teaching experience. The application of theoretical concepts and approaches in the planning and design of curricula.

515 Curriculum Implementation 3 Prereq teaching experience. Research and practice; innovation and change in curricular organization emphasizing implementation.

516 Supervision 2 or 3 Prereq teaching experience. Theory and practice of the supervision of instruction in elementary and secondary schools.

517 In-Service Programs 3 For directors, supervisors, principals, and superintendents with responsibility for in-service programs; practices and procedures in in-service education.

518 Educational Technology 3 Prereq Educ 445 or 446. Relates research and theory of communication to instructional resources and current educational technology; problems of planning and administering programs.

519 Seminar in Teaching and Education 1 May be repeated for credit; cumulative maximum 4 hours. Problems and issues encountered in college teaching.

520 Seminar in Curriculum and Instruction 3-6 Prereq teaching experience. Contemporary issues, analyses and developments of educational programs.

521 Topics in Education 1-4 May be repeated for credit; cumulative maximum 6 hours. Prereq teaching experience. Recent research, developments, issues, and/or applications in selected areas of education.

522 Topics in Education 1-4 May be repeated for credit; cumulative maximum 6 hours. Same as Educ 521.

523 Topics in Education 1-4 May be repeated for credit; cumulative maximum 6 hours. Same as Educ 521.

524 Topics in Education 1-4 May be repeated for credit; cumulative maximum 6 hours. Same as Educ 521.

525 Foundations of Community Education 3 History, purposes, basic concepts underlying contemporary community education programs.

526 Community Education Resources for Problem Solving 3 Identifying community needs and resources, facilitating inter-agency cooperation, organizing the community education program.

528 Content Area Reading Instruction: Theory and Practice 3 For teachers, supervisors, and administrators in elementary, middle, and secondary schools; influence of research on the design of reading strategies.

529 Psycholinguistics for Reading Centers 3 Use of reading/learning centers in the common schools (K-12); design of reading activities from psycholinguistic research perspectives.

530 Innovations in Reading 2 Graduate level counterpart of Educ 430; additional requirements. Credit not granted for both Educ 430 and 530.

531 Innovations in Reading 2 Same as Educ 530. Graduate level counterpart of Educ 431; additional requirements. Credit not granted for both Educ 431 and 531.

532 Children's Literature in the Curriculum 2 Graduate level counterpart of Educ 432; additional requirements. Credit not granted for both Educ 432 and 532.

533 Children's Literature in the Curriculum 2 Same as Educ 532. Graduate level counterpart of Educ 433; additional requirements. Credit not granted for both Educ 433 and 533.

534 Introduction to Guidance 2 or 3 Graduate level counterpart of Educ 454; additional requirements. Credit not granted for both Educ 454 and 534.

535 Introduction to Guidance 2 or 3 Same as Educ 535. Graduate level counterpart of Educ 455; additional requirements. Credit not granted for both Educ 455 and 535.

539 Innovations in Language Arts 2 or 3 Prereq Educ 305 or 320 or teaching experience. The most recent developments in language arts instruction for pre-service and in-service teachers K-12.

540 Elementary School Social Studies 3 Prereq teaching experience. Elementary structures of various social sciences; research findings related to instruction; classroom applications and materials.

541 Elementary School Science 3 Prereq Educ 305; teaching experience. Theories and research underlying modern science programs with classroom implications.

542 Elementary School Mathematics 3 Prereq Educ 305; Math 105; teaching ex-
prerogative. Classroom experiences and materials for helping children understand number properties and operations; research findings related to instruction.


545 Teaching Oral Language Skills in the Elementary School 3 Prereq: teaching experience. Research on children's oral language development; application to elementary school classrooms. (a/y)

546 Teaching Written Expression in Elementary School 3 Prereq: teaching experience. Research on children's written language development; application to elementary school classroom.

547 Teaching Folk Literature to Children and Adolescents 3 Prereq: Edu 307 or 310 or teaching experience. Folk literature as a genre in child and adolescent literature; curriculum applications; reading, language development, social studies, creative expression.


550 Research in Reading 2 or 3 Prereq: Edu 320; teaching experience. Research applied to pertinent classroom problems in the teaching of reading.

551 Psychology of Reading 2 Prereq: Edu 320 or 450/451; teaching experience. Psychological, perceptual, motivational, developmental, and physiological aspects of reading. (a/y)

552 College Reading Practicum V 1 (0-3) to 3 (0-9) May be repeated for credit; cumulative maximum 3 hours. Prereq: Edu 320 or 450/451; teaching experience. Clinical practice; teaching reading skills to college students; programs, materials, techniques, and readings; applicable secondary and college reading programs.

553 Diagnosis and Treatment of Reading Disability 4 (3-3) Prereq: Edu 320. Remedial techniques for experienced teachers, remedial reading teachers, and reading consultants; causes of disability, testing, diagnosis, and remediation; tutoring.

554 Approaches to Reading Instruction 3 Prereq: Edu 320 or teaching experience. Approaches to teaching elementary school reading; theoretical bases, materials, evaluation, implementation strategies.

555 Education of the Gifted Child 2 or 3 Prereq: 9 hrs Edu. Educational provisions for the gifted child.


559 Theoretical Foundations of Counseling 3 Prereq: Edu 459; Psy 102, 431. For beginning counselors.

560 Student Personnel Services in Higher Education 2 or 3 Prereq: Edu 459. Philosophy, structure, functions, and organization of student personnel services.

562 Counseling Practicum V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq: Edu 557, 558, 559. Supervised practice in individual counseling.

563 Seminar in Counseling and Student Personnel 2 or 3 May be repeated for credit; cumulative maximum 6 hours. Prereq: 9 hrs guidance. Review of guidance, counseling, and student personnel research; newer developments.

564 Analysis and Management of Exceptional Behavior 3 (2-3) Graduate level counterpart of Edu 464; additional requirements. Credit not granted for both Edu 464 and 564.

565 Advanced Statistics in Psychology and Education 3 Same as Psy 511.


568 Methods of Research and Thesis Writing 3 Research methods and design; collection, analysis, and interpretation of data.

569 Seminar in Quantitative Techniques in Education 2 or 3 May be repeated for credit; cumulative maximum 6 hours. Prereq: Edu 565. Application of parametric and non-parametric statistics,
data processing using computer packages in educational research.

570 The Community and Junior College 3
For teachers and administrators. Development and function of the junior community college.

571 Undergraduate and Community College Teaching 3 Prereq Educ 570 or 572.
Concepts, principles, issues, and procedures in undergraduate curriculum development; goal oriented educational strategies and delivery systems.

572 The American College and University 3 History, philosophy, objectives, and issues of colleges and universities as social institutions.

573 Recent Developments in Higher Education 3

574 Seminar in Higher Education 2 May be repeated for credit; cumulative maximum 6 hours. Prereq two courses in higher education.

576 Continuing and Adult Education 3 Development and scope of continuing/adult education; basic concepts of administration, teaching, and curriculum development.

580 School Organization and Administration 2 or 3 Prereq teaching experience. Readings and discussions on the theories and practices of school organization and administration.

582 Policy Formation in Education 3 Prereq Educ 580. Policy formation and political aspects of administration; collective bargaining, voter behavior, bonds, ballots, resolutions of conflicts.

583 Community Relations in Education 2 or 3 Social, political, and economic relationships between education and the community; methods of public polling and campaign strategy techniques.

584 Personnel Relationships in Public Schools 2 or 3 Prereq Educ 580. Human relations in education; problems involved and practical solutions considered.

585 Financial Management in Education 3 Economics and financing of education; financial planning, budget development, investment analysis, bonding, cost effectiveness; current trends in educational finance.

586 Facilities Planning 3 Theoretical and practical issues involved in long-range facilities planning; enrollment projections, funding, community involvement, educational specifications, and construction management.

587 Seminar in School Administration 3-6
Prereq 6 hrs graduate work in administration. Interdisciplinary seminars; related studies; discussions in several areas by specialists.

588 The Law and Education 3 Prereq 6 hrs of school administration. Fundamental legal principles within which public education functions; applicable school codes of Washington and other states; review important court cases.

589 Management Development Seminar 3 Improving knowledge and skills in planning systems, decision making, leadership, conflict, motivation, staff development, productivity, and stress.

590 Internship V 3 or 6 May be repeated for credit; cumulative maximum 12 hours. By interview only. Internship in professional positions.

592 Theoretical Foundations of Group Counseling 3 Prereq Educ 559, 562. History; philosophical and theoretical foundations; the group counselor, members, and issues in group counseling.

593 Group Counseling 3 Prereq Educ 559, 562, 592. Group counseling; group process; and leadership in groups.

594 Practicum in Group Counseling 3 (0-9) May be repeated for credit; cumulative maximum 6 hours. Prereq Educ 592, 593. By interview only. Supervised experience.

595 Professional Problems in Counseling Psychology V 1-3 Prereq Educ 557, 558, 559. Seminar in professional problems: identify legal, ethical, training issues, and new professional areas.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Learning Resources
Lib S

304 Learning Resources 3 Basic resources and reference materials, both print and non-print, for elementary and secondary schools.

305 Selection of Book and Non-Book Materials 3 Basic principles, criteria for
selection, evaluation, and current issues in selection of materials for schools.


Special Methods
Special methods courses dealing with the techniques of teaching different secondary school subjects are listed under the departments concerned.

Schedule of Studies
Students planning to complete a program in education must follow the requirements for the Provisional Certificate for the appropriate level, elementary, junior high or high school preparation, as listed in this section of the catalog and the schedule of studies of their degree department. General University Requirements including Psych 102 should be completed during the freshman and sophomore years. At least 40 of the total hours required for the bachelor's degree in this program (elementary school majors only) must be in upper-division courses.

The student's schedule should be planned so that directed teaching may be taken either the first or second semester of the senior year in either half of the semester. With special approval of the Coordinator of Student Teaching in the Department of Education, the directed teaching semester may be taken during the second semester of junior year. Written application for directed teaching must be made by March 1 for the school year preceding enrollment in Educ 405 or 406.

Preparation for Graduate Study
As preparation for work toward an advanced degree in education, a student should have completed an acceptable teacher-education program.

Subject-Matter Requirements for Majors and Minors

Agricultural Education
Senior High School Major:
Teachers qualifying to teach agriculture have the choice of selecting from four options. These options are: (1) production agriculture-mechanics, (2) production agriculture-business, (3) agricultural resources-forestry, and (4) horticulture. Forty-five hours in agricultural sciences are needed with specific courses required depending upon the option selected. See Agricultural Education section of this catalog. Agriculture majors should consult with an adviser in Agricultural Education as the professional education requirements for a teaching certificate differ from the program for other education majors. When all requirements for graduation are completed, the student will qualify for a Bachelor of Science degree in Agricultural Education.

Bilingual-Bicultural Education
Elementary School Major: 34 hours
(Spanish language proficiency required before teaching major is declared.) Ch St 220, 272, 313, 329, 335, 372, 375, 411, plus two blocks of student teaching (Educ 405 and 406). One block of student teaching will be conducted in a bilingual-bicultural classroom.

Biological Science
Senior High School Major: 34 hours, including at least 7 hours in botany and 7 hours in zoology. Bio S 103, 104, 430; Bact 101 or 201; at least one course from each of the following fields: (1) Physiology: Bio S 450, Bot 320, Zool 352, 353; (2) Ecology or Conservation: Bio S 372, 474, Zool 330; (3) Genetics: GenCB 301; (4) Systematics and Evolution: Bot 201, 332, 430, Zool 224 and 225, 305; plus additional electives from the preceding fields or the following: Bact 414, 451; BC/BP 417; Bot 410, 411, 460, 462; Entom 340, 343, 441; GenCB 330; Zool 320, 324, 425, 428, 450, 458. Required minor: 12 hours chemistry including organic; Phys 101 and 102; Math 107 or 140 or 171 or Biom 412. If additional courses are taken to satisfy the departmental requirements, the degree should be taken in bacteriology, biology, botany, or zoology. If not, it should be in General Studies.

Senior High School Minor: 18 hours
Bio S 103, 104, 430; plus two courses from Bact 101 or 201, Bot 201, 332, Zool 224 and 225, 305.

Junior High School Major: 28 hours
Bio S 103, 104, 430; at least one course from each of the following fields: (1) Physiology: Bio S 450, Bot 320, Zool 352, 353; (2) Ecology or Conservation: Bio S 372, 474, Zool 330; (3) Genetics: GenCB 301; (4) Systematics and Evolution: Bot 201, 332, 430,
Zool 224 and 225, 305. Plus additional electives from the preceding fields or the following:
Bact 101 or 201; BC/BP 417; Bot 411, 460, 462; Entom 340, 343, 441; GenCB 330, 
Zool 320, 324, 423, 428, 430, 438. **Required minor:** 12 hours chemistry including organic; 
Phys 101, 102; Math 107 or 140 or 171 or 
Biom 412; Astr 135 or Geol 102. If additional 
courses are taken to satisfy the departmental requirements, the degree should be taken in 
bacteriology, Biology, botany or zoology. If not, it should be in General Studies.

**Junior High School Minor:** 16 hours
Bio S 103, 104, and two courses from Bact 
101 or 201, Bot 201, 332, Zool 224 and 225, 305.

**Chemistry**
**Senior High School Major:** 30 hours
Chem 105, 106, and 107, or 111 and 212; 
217 or 221; plus additional hours from 300- 
and 400-level courses. **Required minor:** Bio S 
430; at least 15 hours of mathematics and 
physics including either Phys 101, 102, or 
201, 202, and Math 107. If additional courses 
are taken to satisfy the departmental requirements, the degree should be taken in chemistry. 
If not, it should be in General Studies.

**Senior High School Minor:** 18 hours
Bio S 430; at least 15 hours in chemistry from 
the courses listed under the major.

**Child Studies**
**Elementary School Major:** 28-30 hours
Soc 101; CPS 240; 247 or 350; 342 or 344; 
442; 448; plus four approved courses from at 
least 3 of the following fields:
Anthropology, Asian American Studies, Black 
Studies, Chicano Studies, Child and Family 
Studies, Native American Studies, Psychology, 
Sociology, Speech, Women Studies. A maximum 
of one 100-level elective will be allowed. 
A minimum of two 300-400-level electives 
must be chosen.

**Communications**
**Senior High School Major:** 30 hours
(An approved teaching minor is required with this major.)

**Journalism:** (Select one of the following groups) Jour 225; 305; 325; 330; 495 (12 
hours); Com 410; 415 plus 2 hours journalism 
electives approved by adviser in communications 
OR Jour 225; 305; 325; 330; 395; 
425; 475; Com 410; 415; Cine 253.

**General Communications:** Student must certify such a program with the Chairperson of the Department of Communications, obtain approval from the Coordinator of Student Personnel Services in the Department of Education, and file a copy of the plan with the Department of Education, preferably before the end of the sophomore year. Jour 395 or 495, Internships, should be included in the program. If these requirements plus those for the College of Sciences and Arts are met, the degree will be the Bachelor of Arts in Communications.

**Senior High School Minor:** 18 hours
Students must complete the courses listed for 
one of the following professional sequences 
plus additional work in Communications to 
total 18 hours: (1) Advertising: Bdec 245 or 
Jour 225; Adver 280; 380; 382; (2) Broadcasting: Bdec 245, 250; 475; Com 415; (3) 
Cinema and Photography: Bdec 245; Cine 
323; 353; 393; 433; 475; (4) Journalism: 
Jour 225; 305; 325; 330; Com 410; 415; 
(5) Public Relations: Jour 225; 305; P R 
312; 313; 413. Elective courses are to be 
approved with an adviser in the Department of Communications.

**English**
(An approved teaching minor is required with this major.)

**Senior High School Major:** 38 hours
Engl 301; 308; 323; 401. At least three of the following: Engl 108, 209, 210, 245, 246.
Two of the following: Engl 304, 305 or 306, 
307, 407, 415. At least one course from each of 
the following groups: (1) Engl 332, 333, 
334; (2) Engl 366, 367, 416, 417; (3) Engl 
316, 320, 368, 369, 471, 472; (4) Engl 255, 
256, 354, 458. If the above requirements plus 
the requirements for graduation of the College of Sciences and Arts are met, the degree 
will be Bachelor of Arts in English.

**Senior High School Minor:** 18 hours
Engl 209, 210; 245 or 246; 255; 301, plus 
3 additional hours from courses numbered 
above 300.

**Environmental Science**
**Senior High School Major:** 34 hours
Env S 101, 102, 302; Env S 404 or Bio S 
474; Env S 444, 493 (4 hrs); Anth 101 or 
Soc 101; 3 hrs upper-division Anth or Soc 
elective; Geol 101 or 102 or 402, or Soils 201; 
Ag Ec 201 or Econ 201; Ag Ec 380; Cpt S 
201. **Required Minors. Physical Science:** Phys
Department of Education

101, 102; Chem 101 and 102, or 105 and 106, 240; Math 107 and 171, or 140 and 141.

**Biological Science:** Bio S 103, 104, 372, 430; Bact 101 or 201; GenCB 201 or 301. These courses will complete the departmental requirements for a degree in Environmental Science.

**Elementary School Major:** 32 hours
Env S 174; Env S 301 or Bio S 372; Env S 302, 303, 444, 493 (2 hrs); Bio S 103, 104, 474; Geol 101 or 102 or 402; Phys 380. Env S 101, 102, Bact 101 and Chem 101 must be taken as GURs.

**Fine Arts**

**Senior High School Major:** 53 hours
F A 102, 103, 110, 111, 201, 202, 203, 320, 331, 340, 350, 360, 370, 389, 498, Educ 492 plus 8 hours of electives in fine arts selected in consultation with fine arts adviser. No minor is required with this major. If the above requirements plus the requirements for graduation of the College of Sciences and Arts are met, the degree will be Bachelor of Arts in Fine Arts.

**Senior High School Minor:** 22 hours
F A 102, 103, 110, 111, 303, 320, 350, 389. Educ 492 is recommended.

**Junior High School Major:** 31 hours
F A 102, 103, 110, 303, 320, 340, 350, 360, 370, 389, Educ 492. If additional elective hours can be taken to satisfy the departmental requirements for graduation, the degree should be in Fine Arts. If not, it should be in General Studies.

**Junior High School Minor:** 22 hours
F A 102, 103, 110, 111, 303, 320, 350, 389. Educ 492 is recommended.

**Elementary School Major:** 31 hours
F A 102, 103, 110, 111, 130, 303, 320, 340, 350, 389, Educ 492.

**Foreign Languages and Literatures**

**Senior and Junior High School Majors:**
A minimum of 24 hours in one language beyond 203 (or 20 hours past 304) plus For L 324.

**French:** 304, 322, 323, 333, 334, 423; For L 324; plus 6 hours from Fren 401 (maximum 2 hrs), 415, 416, 421, 422, 431, 441, 442, 451, 452, 480. Recommended electives: Fren 315, 316, For L 426.

**German:** 304; 315; 316; 322 or 323; 334; 420; For L 324; plus 7 hours from Ger 333, 401 (maximum 1 hr), 432, 433, 442, 451, 452, 460, 480. Recommended elective: For L 426.

**Russian:** 304; 315; 320; 321; 380; For L 324; plus 7-10 hours from Rus 471, 480, 499. Recommended elective: For L 426.

**Spanish:** 304; 315; 316; 321; 322; 323; 326; 333; For L 324; plus 7 hours from Span 320 (maximum 2 hrs), 422, 423, 425, 426, 442, 450, 451, 471, 472, 474, 480. Recommended elective: For L 426.

Students who intend to obtain a teaching major in a foreign language should begin course work in that language in the freshman year. For a teaching minor in a second language or, with the permission of the adviser and the department chair, a teaching minor in another field, the student should begin work on the requirements not later than the beginning of the sophomore year. If the major and minor course programs, the requirements for the Provisional Certificate, and the General University Requirements in the College of Sciences and Arts are met, the degree will be a Bachelor of Arts in Foreign Languages and Literatures.

**Senior and Junior High School Minor:**
A minimum of 8 hours in one language (beyond the third semester) plus For L 324.

**Requirements for specific languages:** Fren, Ger, Rus, or Span 304; plus Fren 322, and at least one hour in the target language; Ger 322 or 323 or 420 plus at least one hour; Rus 380 plus at least one hour of 321; Span 4 hours from 321, 322, 323, 326, 423, 426. Classics minor: Clas 101, 102, and at least 6 hours of 299. Chinese, Italian or Japanese minors: 8 hours of For L 300 or 499. In addition, it is strongly recommended that the student elect Fren 315, 316, 323, and 423; Ger 315 and 316; Rus 315; Span 315 and 316.

**Elementary School Major:**
A minimum of 22 hours in one language (beyond 203) plus For L 324.

**French:** 304, 322, 323, and 333 or 334; For L 324; plus 7 hours from Fren 401 (maximum 2 hrs), 415, 416, 421, 422, 431, 441, 442, 451, 452, 480. Recommended electives: Fren 315, 316, For L 426.

**German:** 304; 316; 322 or 323; 420; For L 324; plus 10 hours from Ger 315, 333, 334, 401 (maximum 1 hr), 432, 433, 442, 451,
452, 460, 480. Recommended elective: For L 426.

Russian: 304; 315; 320; 321; 380; For L 324; plus 5-8 hours from Rus 471, 480, 499. Recommended elective: For L 426.

Spanish: 304; 315; 316; 320 (maximum 2 hrs), 321; 322; 323; 326; For L 324; plus 7 hours from Span 333, 422, 423, 425, 426, 442, 450, 451, 471, 472, 474, 480. Recommended elective: For L 426.

Geology

Senior and Junior High School Minor: 20 hours
Geol 101 or 102; 310, plus 12 hours of additional upper-division course work in Geology selected in consultation with a Geology faculty adviser.

History

Senior High School Major: 35 hours
12 hours in 100-200-level history courses; 18 hours in 300-400-level history courses which must include an undergraduate seminar and Hist 422. This program must include 6 hours (any level) from United States history, European history, and from other fields and areas (Latin America, Asia, Canada). Pol S 206 and Hist 480 are also required. Both an unrelated and related minor are required with this major. If the above requirements and the non-history requirements for a degree in History plus the requirements for graduation of the College of Sciences and Arts are met, the degree will be Bachelor of Arts in History. For the non-history requirements see the departmental adviser and/or the schedule of studies in the history section of this catalog.

Senior High School Minor: 21 hours
Hist 101, 102, or 110, 111; 6 hours from Hist 230, 231, 270, 275; Hist 422 plus 3 hours of upper-division courses in history; Pol S 206.

Home Economics

Senior High School Major: 42 hours
CFS 240; 242; 247; plus 2 hours from CFS 342, 344, 440, 446, 447, 448, 449; CFS 350; 353; 450; 352 or 452; C T 107; 215; 216; 217; HNF 120; 130; 266; electives to make 42 hours in home economics; VTE 343; 345 or 346; 440 or 441; 434. Students completing the General University Requirements (including certain specified courses), the 42 hours of course in Home Economics as outlined above, and the requirements for the Provisional Certificate will receive a Bachelor of Science degree in Home Economics and be eligible for a Vocational Certificate.

Senior High School Minor: 19 hours
CFS 242; 247; 350; C T 107; 217; HNF 120; 130; or 15 hours in any one area of home economics as listed under the Senior High School Major.

Junior High School Minor: 19 hours
CFS 242; 247; 350; C T 107; 217; HNF 120; 130.

Industrial Technology

Senior or Junior High School Major: 70 hours or 64 hours with an approved minor. Students enrolled in the 64 hour major will complete the following courses: VTE 110, 220, 222, 250, 322, 325, 333, 348, 350, 426, 433, 440, 464, 486, 488; Ag M 201, 313, 331, 416; M E 101, 102 or Arch 101, 210; Engl 402. Students wishing the 70 hour major will take VTE 416, 425 in addition to the above. Students taking the 64 hour major will be required to complete an approved minor. If the above requirements plus the requirements for graduation in the College of Education are met, the degree will be Bachelor of Arts in Industrial Technology.

Senior or Junior High School Minor: 25 hours.
VTE 110, 222, 250, 333, 426, 488; Ag M 201, 331; M E 101.

Language Arts

Senior High School Major and Minor:
This consists of a major in English with a minor in speech or a major in speech with a minor in English; see under English and speech.

Junior High School Major: 35 hours
SPE 101; 250; 102 or 200 or 301; 361; 364; ENGL 323 or SPE 435; ENGL 108; 255; 301; two of the following: ENGL 210, 246, 320; Hum 100. If the above requirements plus the requirements for graduation of the College of Sciences and Arts are met, the degree will be Bachelor of Arts in General Studies.

Junior High School Minor: 15 hours
ENGL 108; 255; ENGL 301 or SPE 301; SPE 200 or 205; 250.

Elementary School Major: 30 hours
ENGL 210 or 246, 255 or 256, 301 or 302; EDUC 308 or 309, 430 or 431; SPE 205, 250, 364. Plus eight hours from: SPE 301, 371, 473;
Engl 320, 335; Educ 411, 432 or 433, 445 or 446, 450 or 451.

**Liberal Arts**

**Senior High School Major:** 45 hours

Students will combine three fields, selecting sufficient courses from each to constitute at least the equivalent of a minor. At least two of these fields should be subject matter areas listing a senior high school major; one of the two ought to be intensive enough to be a teaching major. The program, when approved by the adviser in Liberal Arts, will be filed with the Department of Education, preferably before the end of the sophomore year. If these requirements plus those for the College of Sciences and Arts are met, the degree will be Bachelor of Liberal Arts.

**Senior High School Minor:** None

**Mathematics**

(An approved teaching minor is required with this major)

**Senior High School Major:** 32 hours

Math 171, 172, 220, 273, 303, 315, 320, 330, Stat 360, 429 or 443; Cpt S 151; plus one additional 3-hour mathematics course numbered 300 or above. If the additional courses can be taken to fulfill the departmental requirements for graduation, the degree should be in mathematics. If not, it should be in General Studies.

**Junior High School Major:** 29 hours

Math 171, 172, 220, 273, 303, 320, 330, Stat 360, 429 or 443; Cpt S 151; plus one additional 3-hour mathematics course numbered 300 or above. If the additional courses can be taken to fulfill the departmental requirements for graduation, the degree should be in mathematics. If not, it should be in General Studies.

**Senior or Junior High School Minor:** 16 hours

Math 171, 172, 220, 303, 320

**Elementary School Major:** 28 hours

Math 105, 171, 172, 220, 300, 303, 320, Stat 429 or 443; Cpt S 140. If Math 105 or 300 is challenged, one hour of special problems work (Math 499) on curricula should be completed.

**Music**

**Senior and Junior High School Major:** 62 hours

Mus 161, 251, 252, 253, 254, 351, 352, 353, 354, 360, 361, 382, 389, 393, 394, 453 or 455, 480, 481, 482, 490. In addition to the above, students must pass the Functional Keyboard Requirements, complete 14 hours in Performance Studies of which 2 hours must be at the 400-level, and enroll in an approved Music Performing Group each of six semesters. Students preparing to be Music Specialists on the elementary level exclusively may substitute Mus 390 (3 credits) for Mus 382, 482 and 1 hour of Music Performing Groups. If the above requirements, along with graduation requirements of the College of Sciences and Arts are met, the degree will be Bachelor of Music. Graduates qualify as candidates for K-12 Music Specialist Certification.

**Elementary School Major:** 30 hours

Mus 152, 161, 251, 252, 253, 254, 390, and 490, plus one course chosen from Mus 262, 265, 360, 361, 362, 364. In addition to the above, students must pass the Functional Keyboard requirement and complete two hours in Music Performing Groups and four hours of Performing Study in voice, piano, or guitar. Remaining elective hours in music are to be chosen in consultation with the Department of Music. The degree earned is Bachelor of Arts in Education.

**Natural Science**

**Elementary School Major:** 34-36 hours

Astr 135 or 345; Bio S 102 or 103;* Chem 101* or equivalent; Ch E 174 or 474; Env S 101; FRM 303 or Zool 330; Geol 102; Math 105; 300; Phys 101 or 201.*

*It is recommended that the regular two-course sequence in these areas be completed. Additional courses may be chosen from the above and among Bact 101, Bot 201, 332, Cpt S 140, 150, Env S 102, F S 170, GenCB 201, Geol 310, HNF 130, M E 201, Phys 371, 380, PI P 321, Zool 224 and 225, 251, 322.

**Physical Education for Men and Women**

**Senior or Junior High School Major:** 30 hours minimum

PEP 199, 261, 313, 362, 382, 463, 465, 482, 494; H Ed 363; MPE/WPE 104; 5-8 hours from PEP 113, 114/115, 116/117, 120/121, 124, 125/126, 127/118/119. 4 hours from: PEP 314, 316/317, 320, 324, 393; plus 0-3 hours approved electives. An approved teaching minor is required with this major. If a coaching minor is selected, students are strongly urged to select a second minor in an unrelated field. Secondary majors desiring extra preparation for teaching physical education only in grades K-6 must complete the junior or senior high school major in physical educa-
tion plus 13 hours: PEP 354, 379, 380, 383, 389 (3 hrs).

**Senior or Junior High School Minors:**
20 hours minimum
PEP 261, 313, 362, 382, and H Ed 363; plus 4 courses from PEP 100- and 200-level activity courses, MPE/WPE 104, MPE/WPE 235; plus 2 courses from PEP 314, 316, 317, 320, 324, 393. If courses are waived, an equivalent number of credits must be chosen. The physical education minor must be approved by the departments of physical education.

**Coaching:** 21 hours
Spe 102; PEP 220, 266, 330 or 465, 488, 489; plus 6 hours from PEP 200-212, 300-312, 393. PEP 390 may be substituted for one PEP 300 course. A coaching minor must be approved by the Department of Physical Education for each individual.

**Health Education:** 18-20 hours
H Ed 361, 383, 480 or 481; Psych 102; one course from each of the following groups: HNF 130, Env S 101, or equivalent community college course; CFS 247, Psych 230, or Soc 150; Phar 217, 417, or Psych 365.

**Elementary School Major:** 30-31 hours
PEP 104, 6 hrs from PEP 114 or 115, 116, 118, 124, 125, 126, 127; PEP 261, 354, 362, 379, 380, 383, 389 (3 hrs), 463 (2-3 hrs), H Ed 363.

**Physical Science**

**Senior High School Major:** 49 hours
Chem 101, 102, or 105, 106, 107, or 111, 212; Geol 102; Math 171, 220, 320; Bio S 430; Phys 101, 102, or 201, 202; Hist 381 or 382; plus additional hours to equal or exceed 49 hours from Astr 345, 355; BC/BP 371, 372; Chem 217, 240, 340, 341, 342, 343, 383; Cpr S 150, 154, 260; Geol 310, 322, 340, 350, 402, 403; Hist 381 or 382; Math 172, 302, 303, 325, 340, 364; Phys 303, 322, 380, 410. If the above requirements plus the requirements for graduation of the College of Sciences and Arts are met, the degree will be Bachelor of Science in General Studies.

**Senior High School Minor:** 19 hours
Chem 101, 102, or 105, 106, 107, or 111, 212; Bio S 430; Phys 101, 102, or 201, 202.

**Junior High School Major:** 36 hours
Chem 101, 102 or 105, 106, 107, or 111, 212; Math 107 or 140; 171, 220; 320; Bio S 430; Phys 101, 102, or 201, 202; plus at least one course from Astr 135; Chem 217, 240, 340; Geol 102, 120, 322; Math 172, 303, Phys 303. If the above requirements plus the requirements for graduation of the College of Sciences and Arts are met, the degree will be Bachelor of Science in General Studies.

**Junior High School Minor:** 16 hours
Chem 101, 102, or 105, 106, 107 or 111, 212; Phys 101, 102, or 201, 202.

**Physics**

**Senior High School Major:** 29 hours
Phys 201, 202, 303, 310, 320, 330 or 341, 410, 499 (4 hours includes auditing Phys 101 and 102); Bio S 430. If additional elective hours can be taken to satisfy the departmental requirements for graduation, the degree should be in physics. If not, it should be in General Studies. An approved teaching minor must be selected.

**Senior High School Minor:** 20 hours
Phys 201, 202, 303, 310, 499 (4 hours includes auditing Phys 101 and 102); Bio S 430.

**Political Science**

**Senior High School Major:**
It is possible for a student to take a degree in political science and also meet the requirements for the teaching major in social studies. The student should consult with the Departments of Political Science and Education concerning this program.

**Senior High School Minor:**
18 hours plus Hist 422, Pol S 101, 102, 206, 222; plus 6 hours of upper-division electives in political science, with Pol S 300 and 318 recommended.

**Psychology**

**Senior High School Major:** None

**Senior High School Minor:** 18 hours
Psych 101, 102, 285 (Psych 198 may substitute for both Psych 101 and 102); Psych 321 or 350; one course from Psych 360, 361, 363. One 400-level psychology course (Psych 401 strongly recommended); electives from 300- and 400-level Psych courses as needed to reach 18 hours.

**Reading**

**Elementary School Major:** 30 hours
Edu 450 or 451, 430 or 431, 432 or 433, 462 or 463; Spe 205, 371; Anth 250 or 450; plus 13 hours from Edu 308 or 309, 411, 434 or 435, 452, 464, 553, Spe 250, 473, CFS 240,
440. Those that complete Educ 553 do not need to take Educ 462 or 463.

Social Studies
Senior High School Major: 41 hours
15 hours from the following including at least three fields: Anth 101, Econ 201, Hist 101, 102, 110, 111, Pol S 101, 102, Soc S 101, Soc 101; plus Hist 480, Pol S 206, and 21 hours from 300-400-level courses in the social studies are required. One-half of all the courses in the upper-division category must be in history and include Hist 422. For the other half, it is strongly recommended that the student select courses which give as much spread as possible in the fields normally taught in the secondary schools. The requirements for graduation of the College of Sciences and Arts should be used to strengthen, broaden, and supplement this major. A teaching minor is required with this major, and English is the suggested choice. If the above requirements plus the requirements for graduation of the College of Sciences and Arts are met, the degree will be Bachelor of Arts in Social Studies. It is possible for a student to take a degree in political science or another social science and also meet the requirements for the teaching major in social studies. These persons must take a teaching minor in history and a second unrelated teaching minor such as English or a foreign language.

Senior High School Minor: 21 hours
Pol S 206; 12 hours from Anth 101, Econ 201, Hist 101, 102 or 110, 111, Pol S 101, Soc 101; plus Hist 422 and three additional hours of upper-division social studies.

Junior High School Major: 35 hours
Hist 110, 111; Pol S 206; 6 additional hours of lower-division social studies in addition to General University Requirements; Hist 480 and 15 hours of 300-400-level courses in the social studies placing major emphasis on history. Hist 422 is required for this major. Language arts is suggested as the teaching minor. If the above requirements plus the requirements for graduation of the College of Sciences and Arts are met, the degree will be Bachelor of Arts in Social Studies.

Junior High School Minor: 21 hours
Hist 110, 111; plus 9 hours from anthropology, history, and political science; Hist 422; Pol S 206.

Elementary School Major: 29 hours
Educ 485 or 486; Hist 101 or 102, 110, 111.

At least one course from the following groups: Anth 101, 203, 320; Pol S 101, 300, 318; Soc 350, 343, 351, 362. Three upper-division approved courses from Anth, AAS, Bl St, Ch St, Econ, Hist, Na Am, Pol S, Soc, W St. Students will be encouraged to consider courses which reflect contemporary social issues and needs.

Sociology
Senior High School Minor: 18 hours
Soc 101, 102; Hist 422 or Pol S 206; and 9 hours from Soc 350, 340, 351, 362, 371, 373, 374, 410.

Special Education
Elementary School Major: 30 hours
Spe 371, 473; PEP 463; Educ 455, 456, 464; plus 15 hours selected from CFS 240, 440, 442; Educ 411, 430, 431, 434, 450, 462 or 463, 490, 499, 555; PEP 490; Psych 333, 360 or 361, 390, 464; RLS 464; Soc 362; S W 495; Spe 205, 281.

Speech
Senior High School Major: 35 hours
(An approved teaching minor is required with this major)

General Speech: Spe 160, 205, 260, 263, 296, 361, 435, 495. One course from Spe 101, 235, 301; two courses from Spe 102, 250, 302; Spe 330 or 331; one course from Spe 325, 400, 401, 415, 425.

Communication Disorders
A competency-based program leading to an Educational Staff Associate Certificate in Communication Disorders is offered through the Department of Speech. Students interested in this program should contact the communication disorders adviser in the Department of Speech rather than the Department of Education.

Senior High School Minor: 18 hours
General Speech: Spe 250, 260, 361, 435. One course from Spe 101, 235, 301; one course from Spe 102, 302, 330, 331. Spe 160 and 296 are strongly recommended.

Rhetoric and Communication Studies: Spe 250; 435; 495. One course from Spe 101, 235, 301; Spe 102 or 302; Spe 330 or 331; one course from Spe 325, 400, 401, 415, 425.

Theatre Arts and Drama: Spe 160; 260; 263; 264; 361; 435; and 2 hours of Spe 496. (Major in English is recommended).

Elementary School Major: None, see Language Arts.
Department of Electrical Engineering


The curriculum in electrical engineering, accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology, is designed to give the student a strong basic knowledge in the areas of general interest to all electrical engineers. The course of study is therefore oriented toward the basic theory and concepts which prepare one for entry into any of the multitude of activities open to members of the profession—research, development, operations, management, teaching, sales, and consulting. Sufficient laboratory experience is included to provide for familiarity with electrical, electronic, and computing equipment and with experimental techniques. Modern laboratories for electrical circuits, electronics, energy conversion, and computers are available.

All students are expected to use the Amdahl 470 and Hewlett-Packard 1000 digital computers and microprocessor development tools to aid in their studies.

The present curriculum is designed so that the equivalent of the first three semesters may be transferred from the community colleges with minimal difficulty. Some professional courses at the sophomore level, however, are necessary for direct entry into the junior year. The additional basic material common to all branches of electrical engineering is concentrated in the junior year with maximum flexibility introduced into the senior year, allowing the student to pick an area of specialty or to develop a breadth of interest. Special programs may be designed for students planning to continue on to advanced study in law, medicine, or business administration or who wish to pursue undergraduate study in more than one field.

Due to limitations in resources, the Department of Electrical Engineering has been forced to restrict the number of students certified into the program at the junior level. In order for students to be eligible for certification they must have completed E E 261 and E E 262 with a grade of "C" or better. The student may apply for certification during the semester of enrollment in E E 261 and/or 262. Transfer students may apply for certification during their first semester if they will have credit for E E 261 and E E 262 by the end of that semester. Students must have essentially completed the equivalent of the first two years of the Schedule of Studies for Electrical Engineering. Applications for certification must be submitted prior to November 15 or April 15 for spring or fall semester certification respectively. Eligible students will be ranked in accordance with several criteria including WSU and/or transfer g.p.a., g.p.a. in Math and Science and in E E courses. Final acceptance will be made after current semester grades are available, and students will be notified of the department's decision as soon as possible.

Cooperative education agreements exist between the College of Engineering and certain industries. The student should consult the department chair if interested in the type of program involving part-time attendance in the university and part-time work in industry. Students should be prepared to extend their studies somewhat in order to complete the program.

The department offers courses of study leading to the degree of Bachelor of Science in Electrical Engineering and Master of Science in Electrical Engineering. The department participates in the interdepartmental program in engineering science leading to the degree of Doctor of Philosophy. Opportunities for graduate study in these fields are also provided through the Joint Center for Graduate Study in Richland, Washington.

Students from other departments may apply to pursue a minor in E E; however, they must meet the criteria for certification and compete for seats available along with major applicants.

Description of Courses

For explanation see Index under "Symbols"

E E
110 Introduction to Electrical Engineering
2 (1-3) For freshmen only. Activities and career opportunities in E E; basic concepts and practices.
214 Design of Logic and Analog Circuits 3 (2-3) Prereq Math 172 or c//. Functional approach to design of electronic circuits; exposure to elementary circuit concepts and design with integrated circuits.

261 Electrical Circuits I 3 Prereq Phys 202; Math 315 or c/; Cpt S 203 or c/; c/ in E E 262. Fundamental concepts of electrical science and its utilization in circuits, components, and devices.

262 Electrical Circuits Laboratory 1 (0-3) Prereq c/ in E E 261. Electrical instruments; laboratory applications of electrical laws; transient and steady-state responses of simple circuits.

300 [U] Technology and Society 3 Technology and its effects on society; demands of society for technology; critical examination of selected technological-societal problems.

301 Electrical Engineering Fundamentals 3 Prereq Phys 202; Math 172; Basic d.c. and a.c. circuits and machines.

302 Electrical Engineering Fundamentals Laboratory 1 (0-3) Prereq c/ in E E 301. Laboratory experiments accompanying E E 301.

311 Electronics 3 Prereq E E 214, 261 with grade of C or better, major or minor in E E. Fundamental digital and linear electronic circuits and devices including large- and small-signal analysis and design.

314 Microprocessor Systems 3 (2-3) Prereq E E 214; Cpt S 203 or 150 and 151. Comparison of several microprocessor systems with reference to architecture, support software, and electronic characteristics; assembling and programming systems.

321 Electrical Circuits II 3 Prereq E E 261 with grade of C or better, major or minor in E E.; Math 315. Graphs, loop and cut-set analysis, state, and Laplace and Fourier transforms, network functions, frequency response, two-ports, energy and passivity.

331 Electromagnetic Fields and Waves 3 Prereq Phys 202; Math 315; major or minor in E E. Fundamentals of electromagnetic fields, magnetic fields, and electromagnetic waves.


351 Distributed Parameter Systems 3 Pre-

req E E 331. Transmission lines, high frequency electronics, antennas, fiber optics.

352 E E Laboratory I 3 (1-6) Prereq E E 311, 321, or c/; Cpt S 203, major or minor in E E. Experiments in electrical circuits, measurements and electronics; principles of measurements and measuring instruments.

361 Energy Conversion 3 Prereq E E 321, 331. Electromechanical, magnetohydrodynamic, and direct electrical energy conversion.

362 E E Laboratory II 2 (0-6) Prereq E E 361 or c/. Experiments in simulation, modelling, electrical machines.

395 Internship in Electrical Industry I V 1-4 May be repeated for credit; cumulative maximum 6 hours. For sophomores and juniors in E E. Students work full time in engineering assignments in approved industries.

414 Fundamentals of Digital Systems 3 Prereq E E 214. Boolean algebra; minimization of Boolean functions; realization of combinational and sequential logic circuits; digital system organization and design.

418 Digital Control Systems 3 Prereq E E 489 or c/-. Data conversion and sampling, sample-data control systems, digital control systems analysis, computer aided design and simulation microprocessor control.


464 Digital Signal Processing 3 Prereq E E 341. Discrete and fast Fourier transforms; discrete convolution; sampling theorem; digital filtering; pulse transmission; effects of quantization and round-off.


475 Electrical Measurements 2 (1-3) Prereq E E 352. Watthour meters, fault location, magnetic properties, individual instrumentation problem.

476 Electronic Circuits 3 Prereq E E 311, 341, 489 or c/; c/ in 477. Circuits with active elements; design of amplifiers, oscillators, and other circuits using semiconductor devices.
filtering and optical information processing, holography. (a/y)

507 Random Processors in Engineering 3 Prereq Stat 443, Signal detection; optimum filter theory and spectral analysis of discrete and continuous processes in physical systems.


510 Solid State Direct Energy Conversion 3 Prereq one sem thermo. Analysis of homojunction and heterojunction solar cells and thermoelectric generators and refrigerators; optimization and design.

511 Protection of Power Systems 3 Prereq E E 491 or c/. Protection of electrical equipment as related to electric power systems.

512 Active Network Synthesis 3 Devices and classical network synthesis; two-port network theory, amplifiers, filters, negative impedance converters, active filters, and oscillators. Cooperative course taught at the University of Idaho.

514 Digital System Architecture 3 Prereq E E 314, 414. Realization of modern developments in digital system design; associative memory; pattern recognition; special purpose input-output devices; parallel computing techniques.

516 Microwave and Optical Communications 3 Prereq E E 351. Microwave and optical waveguides, active and passive devices, communications systems. (a/y)

517 Electrical, Magnetic, Optical, and Conductive Properties of Solids 3 Prereq one sem thermo. Macroscopic, tensor representation of dielectricity, magnetoelectricity, piezoelectricity, magnetostriiction; electro- and magneto-optical effects; thermoelectricity; Hall, Nernst and Ettingshausen effects.

518 Advanced Electromagnetic Theory I 3 Prereq E E 351. Field theory, classical electromagnetism, potential theory, boundary value problems, wave propagation.

519 Advanced Electromagnetic Theory II 3 Guided waves, inhomogeneous wave equation, radiation, scattering, diffraction.

High Voltage Engineering 3 High voltage-high power phenomena; design and measurements associated with electrical transmission, current interruption, insulation, transformation, lightning, and corona.


Antenna Theory 3 Prereq E E 351. Wire and aperture antennas as radiating, receiving, and scattering elements; arrays of coupled elements, reflectors. (a/y)

Energy Management and Planning 2 Concepts of energy management and planning; forecasting, resource assessment and impact studies.

Data Communication Networks 3 Prereq E E 507. Packet switching networks; local area networks; polled and random access systems; routing; flow control; capacity assignments; statistical multiplexing systems; application.

Advanced Topics in Power Engineering 1-3 May be repeated for credit.

Advanced Topics in System and Circuit Theory 1-3 May be repeated for credit.

Microprocessor System Design 3 (2-3) Prereq E E 414, 466 or c/f/. Design with microprocessors and associated MSI and LSI devices in instrumentation, control, and other applications.

Directed Study in Electrical Engineering 1-3 May be repeated for credit. Current topics in electrical engineering. Cooperative course taught at the University of Idaho.

Integrated Circuit Engineering 3 Prereq E E 496, 476. Basic aspects of integrated circuit engineering, fabrication, device behavior and linear circuit design.

Special Projects or Independent Study Variable credit.

Master’s Research, Thesis, and/or Examination Variable credit.

Master’s Special Problems, Directed Study, and/or Examination Variable credit.

Doctoral Research, Dissertation, and/or Examination Variable credit. (For PhD in engineering science only.)

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<tr>
<th>Schedule of Studies</th>
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<tr>
<td><strong>A Bachelor of Science degree in Electrical Engineering ordinarily requires a total of 128 hours. At least 48 of the total hours required must be in upper-division courses.</strong></td>
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<tr>
<td><strong>Freshman Year</strong></td>
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<td><strong>First Semester</strong></td>
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<tr>
<td>E E 110 Introduction</td>
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<td>Engl 101 Composition</td>
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<td>Chem 105 Principles</td>
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<td>Math 171 Anal Geom Calc</td>
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<td>Soc S Elective (GUR.)</td>
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<td><strong>Second Semester</strong></td>
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<tr>
<td>Cpt S 203 Cpt Prog Engr</td>
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<tr>
<td>Phys 201 Engineering</td>
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<td>Math 172 Anal Geom Calc</td>
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<td>Math 220 Int Linear Alg</td>
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<td>Hum Elective (GUR.)</td>
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<td><strong>Sophomore Year</strong></td>
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<td><strong>First Semester</strong></td>
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<td>E E 214 Log An Ckts</td>
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<td>Math 273 Calculus III</td>
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<tr>
<td>Phys 202 Engineering</td>
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<td>C E 213 Stat Mech Mat</td>
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<td>MSE 302 Materials Sci</td>
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<td><strong>Second Semester</strong></td>
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<tr>
<td>E E 261 Electrical Ckts I</td>
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<td>E E 262 Electrical Ckts Lab</td>
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<td>E E 314 Microprocessor Syst</td>
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<td>C E 214 Intro Dynamics</td>
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<td>Math 315 Diff Equations</td>
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<td>Econ 201 Contemporary</td>
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<tr>
<td><strong>Junior Year</strong></td>
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<td><strong>First Semester</strong></td>
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<tr>
<td>E E 311 Electronics</td>
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<td>E E 321 Electrical Ckts II</td>
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<td>E E 331 Flds &amp; Waves</td>
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<td>E E 352 E E Lab I</td>
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<td>M E 301 Thermodynamics</td>
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<td><strong>Second Semester</strong></td>
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<tr>
<td>E E 341 Communications Syst</td>
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<td>E E 351 Dist Parameter Syst</td>
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<td>E E 361 Energy Conversion</td>
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<td>E E 362 E E Lab II</td>
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<tr>
<td>Engl 402 Prof Tec Wrt</td>
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<tr>
<td>Hum Elective (GUR.)</td>
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<tr>
<td><strong>Senior Year</strong></td>
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<tr>
<td><strong>First Semester</strong></td>
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<tr>
<td>E E 489 Intro Control Syst</td>
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<tr>
<td>Math/Sci Elective</td>
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<tr>
<td>Elective</td>
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<tr>
<td>Approved Technical Electives</td>
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Second Semester

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<th>Course</th>
<th>Hours</th>
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<tr>
<td>Adv Hum or Soc S Elective</td>
<td>3</td>
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<tr>
<td>Non-E E Technical Elective</td>
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<tr>
<td>Approved Technical Electives(^1)</td>
<td>10</td>
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</tbody>
</table>

\(^1\)Senior electives may be chosen from the 400-level courses listed. Undergraduate students with a g.p.a. of 3.0 or better may select up to two 500-level courses to partially satisfy the approved elective requirements. Appropriate courses from other departments will also be accepted. Course selection must include at least (a) 5 hours of design credit (outlines available in departmental office), (b) one scheduled laboratory course, (c) 15 hours E E, and (d) 3 hours outside the department. The student must select electives with an adviser’s approval prior to the end of the junior year.

Transfer Students

Students planning to transfer from other institutions should carefully note the sequence of courses listed above. Transfers from community colleges should consult the booklet "Transfer Programs for Washington Community Colleges" or should write directly to this department for specific information.

Preparation for Graduate Study

Before undertaking graduate study in electrical engineering, a student should have completed substantially the equivalent of the above schedule of studies. Undergraduate students who qualify for graduate school may be invited to participate in a combined 5-year BS-MS program. For students entering from other areas, completion of necessary prerequisite courses may be undertaken while enrolled as a graduate student.

Description of Courses

For explanation see Index under "Symbols"

Engl

100 Mechanics of English 1 Basic usage, grammar, and mechanical aspects of written English.

101 [W] English Composition 3 The writing of correct, coherent English prose, stressing orderly development of thought and precise exposition. Credit not granted for both Engl 101 and 105.

102 [W] English Composition for Chicanos 3 Same as Ch St 102.

103 Basic Skills in English—ESL 3 English grammar, composition, and pronunciation for foreign students.

104 Intermediate Grammar and Basic Skills ESL 3 More complex aspects of English syntax and the development of basic reading, abstracting, and writing skills.

105 [W] Freshman Composition for ESL
Students 3 Special grammatical and rhetorical problems of ESL students. Credit not granted for both Engl 105 and 101.

106 Conversation ESL 1 May be repeated for credit; cumulative maximum 2 hours. Oral communication designed specifically to fit the needs of international students with such difficulties.

108 [H] Reading Literature 3 Reading for pleasure, appreciation, and enlightenment: short stories, novels, plays, poetry.

198 [W] English Composition Honors 3
199 [H] English Composition and Literature Honors 3


209 [H] Survey of English Literature to 1750 3
210 [H] Survey of English Literature 1750 to 1900 3

245 [H] American Literature to 1855 3
246 [H] American Literature since 1855 3

255 English Grammar 3

256 The Organization of English 3 The phonology, morphology, and syntax of English, especially contemporary American.

260 [H] Great Works Series 2 Works of lasting appeal in world literature through the 18th century.

261 [H] Great Works Series 2 Works of lasting appeal in world literature since the 18th century.


304 Chaucer 3 Poetry and prose of Geoffrey Chaucer.

305 [H] Shakespeare 3 Shakespearean drama to 1600.
306 [H] Shakespeare 3 Shakespearean drama after 1600.


308 [H] Introduction to Literary Criticism 3

311 Asian American Literature 3 Same as AAST 311.

316 Introduction to American Studies 3 Prereq 6 hrs from Hist 110, 111, Engl 245, 246. Significant American ideas, themes, myths, lore, behavior patterns.

319 [H] Black Literature in America, 1700-1900 3 Same as Bl St 319.

320 [H] Black Literature in America 1900 to Present 3 Black literature from the Harlem Renaissance to the present.

323 Approaches to the Teaching of English 3 English literature and composition in secondary schools.

332 [H] Poetry: Twentieth Century 2 20th century poetry including Continental.

333 [H] Fiction: Twentieth Century 3 20th century fiction including Continental.

334 [H] Drama: Twentieth Century 3 20th century drama including Continental.

335 [H] The Bible as Literature 3

338 [H] Topics: Major Trends 3 May be repeated for credit; cumulative maximum 6 hours. Movements in literature, e.g., Existentialism, Romanticism, Women in Literature, Theater of the Absurd.

339 Topics: Major Figures 3 May be repeated for credit; cumulative maximum 6 hours. Major figure or major group of figures in British, Continental, or American literature.

351 Creative Writing: Prose 3 Prereq Engl 101.

352 Creative Writing: Poetry 3 Prereq Engl 101.

354 History of the English Language 3 Prereq 1 yr For L. Language related to the origin, history, and literature of its speakers.

355 Women Writers 3 Women's artistic and intellectual contributions to prose, fiction, drama, and poetry.

366 [H] The English Novel: Defoe to Eliot 3

367 [H] The English Novel: Meredith to the Present 3

368 [H] American Fiction to 1900 3

369 [H] American Fiction Since 1900 3

401 Advanced Writing 3 Advanced problems in writing, criticism, and research.


403 Professional and Technical Writing—ESL 3 Technical writing techniques, formal report preparation; focus on special grammatical and rhetorical problems of ESL students.

406 English Renaissance Literature I 3 Non-dramatic literature of the period 1500 to 1600. Credit not granted for both Engl 406 and 506. (a/y)

407 English Renaissance Literature II 3 Non-dramatic literature of the period 1600 to 1660.
409 English Renaissance Drama 3 English drama to 1660. (a/y)
415 Dryden, Pope, and Johnson 3 Neoclassical literature from 1660 to 1798. Credit not granted for both Engl 415 and 515.
416 English Romantic Literature 3
417 Victorian Literature 3
451 Advanced Creative Writing: Prose 3 May be repeated for credit; cumulative maximum 6 hours.
452 Advanced Creative Writing: Poetry 3 May be repeated for credit; cumulative maximum 6 hours.
458 Topics in Psycholinguistics 3 May be repeated for credit; cumulative maximum 6 hours. Relates psycholinguistic research to linguistic and psychological theory; application of such research to reading, writing, and language remediation.
470 American Culture Series 3 May be repeated for credit; cumulative maximum 6 hours. The West in American literature; American studies topics.
471 American Romantic Movement 3 Pre-req Engl 245 and 246. Credit not granted for both Engl 471 and 571.
472 American Poetry 3
495 Topics in English 3 May be repeated for credit; cumulative maximum 12 hours. Literature of special or current interest: detective fiction, science fiction, feminism in literature, children’s literature, and others.
499 Special Problems V 1-4 May be repeated for credit.
501 Topics in Teaching Writing 3 May be repeated for credit; cumulative maximum 9 hours. Theory and practice of teaching of English composition from remedial to advanced levels.
503 Old English: Anglo-Saxon 3
504 Old English: Beowulf 3
506 English Renaissance Literature I 3 Graduate level counterpart of Engl 406; additional requirements. Credit not granted for both Engl 406 and 506.
507 Shakespeare 3 Plays, poems, criticism, and background materials.
510 Backgrounds of American Literature 3 Dominant themes in American literature and their European origin.
511 Seminar in Colonial and Provincial Literature 3
512 Introduction to Graduate Study 3
513 Seminar in American Studies 3 May be repeated for credit. Same as Hist 513.
514 Seminar in Regional American Literature 3 May be repeated for credit.
515 Dryden, Pope, and Johnson 3 Graduate level counterpart of Engl 415; additional requirements. Credit not granted for both Engl 415 and 515.
519 Seminar in Nonfiction Prose 3 May be repeated for credit.
521 Seminar in British Romantic Literature 3 May be repeated for credit.
522 Seminar in Victorian Literature 3 May be repeated for credit.
525 Seminar in English Literature of the Seventeenth Century 3 May be repeated for credit.
527 Seminar in English Literature of the Restoration and Eighteenth Century 3 May be repeated for credit.
529 Nineteenth-Century American Fiction 3 May be repeated for credit.
533 Seminar in the English Renaissance 3 May be repeated for credit.
537 Seminar in English Literature 3 May be repeated for credit.
543 Problems in English Linguistics: Syntax and Phonology 3 May be repeated for credit; cumulative maximum 6 hours.
544 TESOL: Theory and Methods 3 May be repeated for credit; cumulative maximum 6 hours. Pre-req Engl 543. Theoretical issues and practical experience in ESL, classroom situation.
547 Literary Criticism 3 Theories of literature from Plato and Aristotle to the present.
548 Seminar in Literary Criticism 3 May be repeated for credit. Problems in the theory and practice of literary criticism.
549 Twentieth-Century Prose Fiction 3 May be repeated for credit; cumulative maximum 6 hours. Selected American and English masterpieces of the 20th century.
550 Seminar in Twentieth Century Poetry 3 May be repeated for credit.
551 Seminar in Twentieth Century Drama 3 May be repeated for credit.
554 History of the English Language 3
555 Seminar in Middle English Literature 3 May be repeated for credit.
560 Seminar in Drama 3
567 Seminar in English Novel 3
571 American Romantic Movement 3 Graduate level counterpart of Engl 471; additional requirements. Credit not granted for both Engl 471 and 571.
573 Seminar in Major American Writers 3
May be repeated for credit.

580 Seminar in Medieval Literature 3
May be repeated for credit. The literature of western Europe from 450 to 1500.

591 Seminar in Literary Studies 3
May be repeated for credit. Same as For L 591.

595 Topics in English 3
May be repeated for credit; cumulative maximum 6
hours. Language, English pedagogy, or
literature of special or current interest;
reading theories, teaching of writing,
current literary theories.

598 Teaching Apprenticeship 1
May be repeated for credit.

600 Special Projects or Independent Study
Variable credit.

700 Master's Research, Thesis, and/or Ex-
amination Variable credit.

702 Master's Special Problems, Directed
Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/
or Examination Variable credit.

**Schedule of Studies**

At least 45 of the total hours required for the bachelor's degree in this program must be in
upper-division courses.

Three programs are offered for the English major; all lead to the degree of Bachelor of
Arts in English. Option I is a traditional Eng-
lish program for the professional. Option II
is a program for English-Education majors
(see Department of Education). Option III
is a program for students who want a broad
education emphasizing language and literature.

The department also offers a minor in Eng-
lish.

**Option I: Professional Major**

A) Three from Engl 209, 210, 245, 246 9

B) Engl 301, 401 6

C) Two from Engl 304, 305 or 306, 307, 308 6

D) One from each of the following
groups:

1) Engl 255, 256, 354, 458 3

2) Engl 406, 407, 409 3

3) Engl 366, 410, 415 3

4) Engl 367, 416, 417 3

5) Engl 470, 471, 472 3

6) Engl 316, 319, 320, 368, 369 3

Total 39

**Option II: Teaching Major**

A) Three from Engl 108, 209, 210, 245, 246 9

B) Engl 301, 401, 308, 323 12

C) Two from Engl 304, 305 or 306, 307, 407, 415 6

D) One from each of the following
groups:

1) Engl 366, 367, 416, 417 3

2) Engl 316, 320, 368, 369, 471, 472 3

3) Engl 332, 333 or 334 2-3

4) Engl 255, 256, 354, 458 3

Total 38 or 39

**Option III: General Major**

A) Three from Engl 108, 209, 210, 245, 246 9

B) Engl 301, and one from 351, 352, 401 or 402 6

C) Two from:

1) Engl 255, 256, 354, 458 6

2) Engl 304, 305 or 306, 307 6

3) Period courses numbered above 400 6

D) One from genre courses numbered above 300 3

Total 39

**English Minor**

The student must complete a minimum of 16
hours in English courses (excluding 101 and
108), half of which must be upper-division.
The 16 hours must also include one composi-
tion course beyond English 101.

**Preparation for Graduate Study**

Students interested in a graduate program in
English at Washington State University should
offer preparation in English courses generally
approximating one of the three undergraduate
programs described above. Students with un-
dergraduate majors in such subjects as philos-
ophy, foreign languages, and history may also
be accepted for graduate study in the depart-
ment. Every student should be well grounded
in at least one modern foreign language.

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**Department of Entomology**

Professor and Department Chair, B. P. Catts; Professors, R. D. Akre, A. A. Berryman, R. F. Harwood, C. A. Johansen; Associate Professors, J. J. Brown, G. E. Long, W. J. Turner; Assistant Professor, G. L. Piiper.
Insects are dominant organisms in most terrestrial ecosystems, competing for resources such as food, water, and shelter with most other species. Understanding the behavior, morphology, and life cycles of insects is essential to controlling pests, conserving resources, and managing ecosystems. Insect diversity and the impact of pesticides on non-target species are of increasing concern due to their potential for unintended consequences. Pesticide usage requires people knowledgeable in the safe use of pesticides and in the effect of such use on the total environment.

The entomology curriculum provides the opportunity to study the basic and applied aspects of entomology. Courses are offered for majors and non-majors, providing needed training for students in agriculture, education, veterinary medicine, microbiology, public health, environmental sciences, and natural sciences.

The curriculum prepares students for graduate study in entomology or for employment in institutional or private pest control oriented areas. An interdisciplinary curriculum in integrated pest management (IPM) is available to students with interests that span entomology and pest management. That curriculum is described under the General Agriculture section of this bulletin.

Facilities are available for graduate study in the major areas of entomology: apiculture, behavior, biological and integrated control, economic entomology, ecology, forest entomology, insect-plant relationships, medical/veterinary entomology, morphology, physiology, and taxonomy. Departmental faculty at outlying research centers also serve as advisers for graduate student research, and sometimes teach audio courses. Extensive insect collections, computer and video facilities support teaching and research.

The department offers courses of study leading to the degrees of Bachelor of Science in Entomology, Master of Science in Entomology, and Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Entom
201 Insects and Our Environment: The world of insects, their natural history and relationship with humans and their environment. (a/y)
348 Forest Entomology 3 (2-3) Same as FRM 348.
440 Field Entomology 1 or 2 May be repeated for credit. Prereq Entom 340 or 343. One or two weeks of field investigation in entomological problems.
441 Taxonomic Entomology 5 (3-6) Prereq Entom 340 or 343. Biology, literature and identification of all orders and important families of insects; theory, techniques and history of insect classification. (a/y)
443 Insect Ecology 3 (2-3) Prereq Entom 340 or 343. Interrelationships of insects with the physical and biotic environments; population dynamics and community relations. (a/y)
444 Insect Morphology 5 (2-9) Prereq Entom 340 or 343. Comparative external morphology and internal morphology and internal anatomy of insects. (a/y)
446 (447) Biological and Cultural Suppression of Insect Pests 3 Prereq Entom 217. Plant resistance, parasitoids, predators, pathogenic microorganisms; environmental manipulators, cultural practices; other biological means for suppression of plant insect pests. Cooperative course taught at the University of Idaho. (a/y)
448 Medical Entomology 4 (3-3) Prereq Bio S 103, 104. Insects and related arthropods affecting human and animal health; means of control. (a/y)
450 Principles of Applied Entomology 3 (2-3) Prereq Entom 340 or 343. Utilization of biological, physical, and chemical factors in controlling insect populations. (a/y)
472 Aquatic Entomology 1 Identification and biology of insects associated with aquatic and subaquatic environments. Cooperative course taught at the University of Idaho.
474 Aquatic Entomology Lab 2 (0-6) Prereq c/ in Entom 472. Field trips required. Cooperative course taught at the University of Idaho.
499 Special Problems V 1-4 May be repeated for credit.

511 Principles of Systematic Biology 3 (2-3) Same as Zool 511. (a/y)

540 Taxonomy of Immature Insects 5 (3-6) Prereq Entom 441. The orders and families of insects as distinguished by characteristics of eggs, nymphs, larvae, and pupae. (a/y)

541 Advanced Insect Ecology 3 (2-3) Prereq Entom 343; general ecology or Entom 443. Population and community dynamics; theory and application in natural and artificial systems. Cooperative course taught at the University of Idaho. (a/y)

542 Insect Behavior 4 (3-3) Prereq 10 hrs Entom. Principles of behavior of insects; orientation to environmental conditions. (a/y)

543 Population Management 2 (1-3) Prereq Math 171; Cpt S 201 or 210; an ecology course. Systems approach to theoretical population ecology and its application to management problems. (a/y)

544 Acarology 2 Prereq Entom 441. Identification and biology of mites affecting food production and storage. (a/y)

545 Toxicology of Insecticides 4 (3-3) Prereq Chem 240, Zool 222 or Entom 340 or 343. General principles of insecticide toxicology; classification, mode of action and metabolism of each group of insecticide chemicals; hazards to invertebrates. (a/y)

550 Insect Physiology 4 (3-3) Prereq Chem 240; Zool 352; Zool 222, or Entom 340 or 343. General principles of insect physiology; the mechanisms of vital processes in insects; organ, cellular, subcellular, chemical and physical levels. (a/y)

560 Photography for Entomologists 2 (1-3) Prereq Entom 343. By interview only. Technique of scientific photography; macrophotography, cinematography, and microphotography; use of specialized films and methods. (a/y)

561 Quantitative Methods in Entomological Research 3 Prereq Math 171; Cpt S 201; 20 hrs biological sciences. Practical methods for the acquisition, storage, analysis, and presentation of entomological data. (a/y)

582 Insect Physiological Ecology 2 Prereq Entom 484. Selected topics in physiological ecology. Cooperative course taught at the University of Idaho. (a/y)

593 Seminar 1 May be repeated for credit. Prereq 20 hrs biology. Reporting problems and research in entomology.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in this curriculum must be in upper-division courses.

A major in entomology requires Entom 343 and 441, plus a minimum of 11 hours of Entom electives and the following: Ag Ec 201 or Econ 201, Bio S 103, 104, 372; Bot 332 or 320; Chem 105, 106 and 240 or 340. Engl 101 and 3 hours writing and 2-3 hours communication skills (writing or speech); GenCB 301; Math 140 or 171; Phys 101 and another physical science course; Zool 352 or 353; Zool 332.

Students planning to become pest control consultants or pest management specialists should include courses in pest management: IPM 201, 452, 462, PL P 329; Soils 201; Agron 305; Ag Ec 201; Biom 310 or 412 and crops courses in agronomy and horticulture.

Preparation for Graduate Study

As preparation for work toward an advanced degree in entomology, a student should have completed an undergraduate major in some field of biological science, chemistry, forestry or agriculture. Background work should include courses in general biology, organic chemistry, physics, genetics, invertebrate biology, ecology, botany, calculus, entomology, insect taxonomy and zoology.

Program in Environmental Science and Regional Planning

Program Chair and Professor, C. B. Millham; Regional Planning Major Adviser: Assistant Professor, J. D. Karter; Environmental Science
Major Advisors: Associate Professors, G. L. Young, E. H. Franz.

The program coordinates two closely related fields of study: environmental science and regional planning. Environmental science is concerned with the study of natural and modified environments and their interactions with biological (including human) systems with an emphasis on the comprehensive understanding of the environmental/ecological context, assessment of beneficial and disruptive impacts, and methodologies to analyze, interrelate and resolve these complex systems. The regional planning curriculum provides an understanding of basic issues, methods, and processes in rural, land use, and regional planning with comprehensive studies of natural and human systems. Students of both fields acquire the holistic and interdisciplinary perspectives and ecological understanding necessary to prepare them for a variety of roles in the study, planning, and management of resources and the environment.

The program offers courses of study leading to the degrees of Bachelor of Science in Environmental Science, Master of Science in Environmental Science, and Master of Regional Planning. Study for the Doctor of Philosophy degree is coordinated through the all-university individual interdisciplinary Ph.D. program.

Institute for Resource Management fellowships are available to qualified M.S. and M.R.P. students in the program. The Institute Fellows participate in a joint program with fellows at the University of Idaho. This program provides broad experience in the study of resources, stressing the requisites for orderly, balanced development.

Because of the diversity of these fields, the course of study for each student is flexibly designed in a unique, multi-optional interdisciplinary context. Environmental science majors can specialize in agricultural ecology, biological science, human ecology, environmental education, environmental quality control, natural resources, physical science, or regional and land-use planning. Regional planning majors can specialize in a variety of areas including natural and physical resources, policy planning, transportation and local government planning. Environmental science majors specializing in environmental education are granted Senior High School teaching certificates with endorsements for the major and minors in physical and biological science.

The program is closely coordinated with the Environmental Research Center, the Office of Applied Energy Studies, and other university research units. It is administratively supported by the Colleges of Agriculture, Business and Economics, Engineering, and Sciences and Arts. The participating faculty resource list for the program includes some 90 members representing over 40 disciplines.

Description of Courses

For explanation see Index under "Symbols"

Environmental Science

Env S
101 [U] Environment and Human Life 3 Interactions between humans and their environment; multidisciplinary introduction to environment concepts and concerns.
102 [U] Environment and Human Life 1 Prereq c/ in Env S 101. Environmental problems; possibilities for solutions; environmental management.
174 [Z] Introduction to Meteorology and the Atmospheric Environment 3 Same as Ch E 174.
301 Forest and Range Environments 3 Same as FRM 301.
302 Environmental Field Trip 1 (0-3) Prereq Env S 101 or c/. One week field trip during spring vacation to study environmental problems and management practices from perspective of government and industry.
303 [B] Conservation of Renewable Resources 3 Same as FRM 303.
321 [B] Plant Diseases, Environment, and Human Welfare 3 Same as PL P 321.
402 Earth's Resources 3 Same as Geol 402.
403 Environmental Geology 3 Same as Geol 403.
404 The Ecosystem 3 (2-3) Prereq Math 171; Cpt S 150 plus one of 151-4; Bio S 372. Analysis and simulation of ecosystem processes; dual emphasis on ecological principles and development of models to evaluate policies for management. Credit not granted for both Env S 404 and 504.
427 (480) Environmental Chemistry 3 Same as Chem 427.
444 Environmental Impact Statement Assessment 3 (2-3) Analysis of environmental impact statements and their legal framework; methods of environmental assessment and team development of
an impact statement. Credit not granted for both Env S 444 and 544.

470 Fundamentals of Air Pollution 3 Same as Ch E 470.

474 Applied Meteorology 2 Same as Ch E 474.

493 Seminar 1 May be repeated for credit; cumulative maximum 6 hours.

495 Undergraduate Internship V 1-12 May be repeated for credit; cumulative maximum 12 hours. By interview only. Practical experience in appropriate agencies; for career students in environmental science.

499 Special Problems V 1-4 May be repeated for credit.

504 The Ecosystem 3 (2-3) Graduate level counterpart of Env S 404; additional requirements. Credit not granted for both Env S 404 and 504.

520 Special Topics 2 May be repeated for credit; cumulative maximum 6 hours.

521 Special Topics in Air Pollution V 1-3 May be repeated for credit; cumulative maximum 6 hours. Same as Ch E 521.

536 (510) Modeling and Simulation of Ecological Systems 3 Same as Cpt S 536.

544 Environmental Impact Statement Assessment 3 (2-3) Graduate level counterpart of Env S 444; additional requirements. Credit not granted for both Env S 444 and 544.

549 Local Government and Land Use Planning Law 3 Legal analysis of local government organization and powers; land use control. Cooperative course taught at the University of Idaho.

571 Air Pollution Meteorology 3 Same as Ch E 571.

572 Air Pollution Measurement Techniques 2 (1-3) Same as Ch E 572.

573 Air Pollution Abatement and Administration 2 Same as Ch E 573.

574 Air Pollution Seminar 1 Same as Ch E 574.

588 Land and Resource Regulation 3 Prereq R P 550. Legal analysis methods and concepts for non-law students in resource management. Cooperative course taught at the University of Idaho.

593 Graduate Seminar 1

595 Graduate Internship V 1-12 May be repeated for credit; cumulative maximum 12 hours. By interview only. Practical work experience in appropriate agencies; for graduate career students.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

Regional Planning

R P

450 Principles and Practice of Planning 3 Prereq Env S 101. History, theory, methods, and processes in regional planning; contemporary issues and professional practice.

535 Regional Planning Theory 2 Prereq Pol S 102; Econ 203. Theories of planning; syoptic, incremental, transactive, advocacy and radical planning traditions; quantitative planning theories.

540 History of Regional Planning 2 Prereq Soc 101. Development of regional planning in various civilizations from classical times to present day.

550 Methods and Processes in Regional Planning 3 (2-3) Prereq R P 540; Biom 412. Basic analysis and approaches to planning; implementation techniques; planning agencies.

567 Regional Landscape Inventory and Analysis 5 (1-12) Graduate level counterpart of L A 467; additional requirements. Credit not granted for both L A 467 and R P 567.

568 Advanced Regional Planning Studio 3 (1-6) Prereq L A 467 or R P 567. Programming and management of regional planning suitability analysis and resource management, strategies, techniques; computerized evaluation and assessment of resource information.

570 Cartography for Planners 3 (2-3) Prereq R P 550, 567. Map design and production techniques for planners and land resource managers. Cooperative course taught at the University of Idaho.

590 Special Topics in Regional Planning V 1-3 May be repeated for credit.

593 Seminar in Regional Planning 1 May be repeated for credit.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.
Schedule of Studies

This course of study for the bachelor’s degree is organized around the requirements listed below; additionally a sequence will be designed by each student and the major adviser to provide training depth in one of eight optional areas of specialization: agricultural ecology, biological science, human ecology, environmental education, environmental quality control, natural resources, physical science, or regional and land use planning. (Fact sheets on each option are available from the program office.) At least 40 of the total hours required for the Bachelor of Science in Environmental Science must be in the upper-division courses, 18 of which are in the chosen area of specialization (normally in not more than two departments). Majors in environmental science must satisfy General University Requirements as specified for majors in the College of Sciences and Arts; many of these requirements are built into the curriculum below. Students should note the lack of specific courses in the humanities, at least 6 hours of which must be included in their course work. Each major must also complete 8 hours in a modern foreign language unless he/she has completed two years of such language in high school (or one year in high school and four hours in the same language at WSU). The program provides a strong foundation for advanced study in many professional and basic research fields.

Freshman Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Env S 101 Env &amp; Human Life</td>
<td>3</td>
</tr>
<tr>
<td>Env S 102 Env &amp; Human Life</td>
<td>1</td>
</tr>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Chem 105 Principles</td>
<td>4</td>
</tr>
<tr>
<td>Math 107 or 201</td>
<td>3</td>
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Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>Anth 101 General</td>
<td>3</td>
</tr>
<tr>
<td>Chem 106 Principles</td>
<td>4</td>
</tr>
<tr>
<td>Math 171 or 202</td>
<td>3-4</td>
</tr>
<tr>
<td>Econ 201 Principles</td>
<td>3</td>
</tr>
<tr>
<td>Soc 101 Introduction</td>
<td>3</td>
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</table>

Sophomore Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>Bio S 103 Introductory</td>
<td>4</td>
</tr>
<tr>
<td>Phys 101 or 201</td>
<td>4</td>
</tr>
<tr>
<td>Geol 102 or Soils 2011¹</td>
<td>4-3</td>
</tr>
<tr>
<td>Engl 201 or 402</td>
<td>3</td>
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<tr>
<td>Cpt S 150 plus one of 151-4</td>
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Second Semester

<table>
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<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Bio S 104 Introductory</td>
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</tr>
<tr>
<td>Phys 102 or 202</td>
<td>4</td>
</tr>
<tr>
<td>Chem 240 or 340/341</td>
<td>4-5</td>
</tr>
<tr>
<td>Env S 302 Field Trip</td>
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<tr>
<td>Humanities Elective</td>
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Junior Year

First Semester

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<tbody>
<tr>
<td>Bact 101 or 202</td>
<td>4-5</td>
</tr>
<tr>
<td>Genetics or Physiology²</td>
<td>3-4</td>
</tr>
<tr>
<td>Upper-division Pol S³</td>
<td>3</td>
</tr>
<tr>
<td>Env S 493 Seminar⁴</td>
<td>1-2</td>
</tr>
<tr>
<td>Electives/Option Courses</td>
<td>4-5</td>
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Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper-division Anth³</td>
<td>3</td>
</tr>
<tr>
<td>Bio S 372 General Ecology</td>
<td>4</td>
</tr>
<tr>
<td>Env S 493 Seminar</td>
<td>1-2</td>
</tr>
<tr>
<td>Electives/Option Courses</td>
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</table>

Senior Year

First Semester

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<th>Course</th>
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</tr>
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<tr>
<td>Env S 404 Ecosystem</td>
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<tr>
<td>Bio S 474 Human Ecology</td>
<td>3</td>
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<tr>
<td>Upper-division Soc³</td>
<td>3</td>
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<tr>
<td>Env S 493 Seminar</td>
<td>1-2</td>
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<tr>
<td>Electives/Option Courses</td>
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Second Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper-division Econ⁴</td>
<td>3</td>
</tr>
<tr>
<td>Biom 412 (or other statistics)</td>
<td>3</td>
</tr>
<tr>
<td>Env S 444 Impact Statements</td>
<td>3</td>
</tr>
<tr>
<td>Env S 493 Seminar</td>
<td>1</td>
</tr>
<tr>
<td>Electives/Option Courses</td>
<td>4</td>
</tr>
</tbody>
</table>

¹Geol 403 is acceptable as a substitute for this requirement.

²One course in genetics or physiology is required, to be selected from: GenCB 201 or 301, Bio S 305, Bot 320, or Zool 352.

³Anthropology—Anth 304, 309, or upper-division ethnology or ethnography course. Political Science—Pol S 423 or upper-division public policy formation course. Sociology—Soc 330, 331, or 431. Economics—Econ 316, Ag Econ 380, or Econ 472.

⁴Env S majors are required to complete four (4) credit hours of the Env S 493 Seminar series in any combination of 1 or 2 credit sections.

NOTE: Courses taken to fulfill the above requirements, as listed, cannot be taken to satisfy requirements for the option. Beyond those options listed, students are encouraged, in close consultation with an adviser, to create their
own option, one more closely fitted to their specific needs. Such option alternatives must be approved by the program adviser. Those students taking a dual major or who already have a bachelor’s degree may use the other degree program as a substitute for the option, with their adviser’s permission.

Preparation for Graduate Study
Before applying for admission to the graduate programs, a student should have completed an undergraduate curriculum that included examination of a physical, biological, or social system in sufficient depth to serve as background for advanced investigation of one or more of these systems in an ecological context. For graduate study in environmental science, previous course work in sociology or cultural anthropology, conservation of natural resources, biological science, chemistry or physics, and calculus is required. General requirements for the Master of Science degree in Environmental Science include upper-division or graduate-level courses in ecology, mathematics, statistics, or computer science; applied, physical, biological, or social science; environmental impact statement assessment; graduate seminar; and special topics in environmental science. For graduate study in regional planning, previous course work in economics, sociology or political science, biological science, physical science, quantitative skills, and communication skills is required. General requirements for the Master of Regional Planning degree include upper-division or graduate-level courses in regional planning; environmental impact statement assessment; seminar; and special topics; plus practical experience and a comprehensive examination.

Department of Fine Arts

Professor and Department Head, R. Coates; Professors, R. Feaster, F. Ho, K. Monaghan, A. Okazaki; Associate Professors, J. Dollhausen, J. Hockenbuhl, R. Holm, J. Schuman, P. Silor; Assistant Professors, K. Dills, J. Leisure.

The Fine Arts Department offers a diversity of experiences in the visual arts. Courses are designed to give the student both historical perspectives and practical skills in a variety of media.

Students interested in preparing for secondary and primary teaching find that the department, working with the Department of Education, provides ample training for them as artists and teachers. Those in art education who wish to take the Bachelor of Arts in Fine Arts should complete the minimum departmental requirements of 53 hours.

The department offers courses of study leading to the degrees of Bachelor of Arts in Fine Arts and Master of Fine Arts.

Description of Courses

For explanation see Index under “Symbols”

Foundation
F A
101 [H] Introduction to Art 3 For non-majors. Appreciation of various visual art forms; emphasis on contemporary period.
102 Fine Arts Orientation 1 Prereq c/ in F A 103. Introduction to various media of fine arts.
103 Art 3 (0-6) Prereq c/ in F A 102. Introduction to formal elements through studio experience.

Art History
104 [H] Black Visual Arts 3 Same as BI St 102.
201 [H] Art of Western Civilization 3 Survey of visual arts from prehistory, Egypt, ancient Near East, Greece, and Rome; 15th century B.C. to 4th century A.D.
202 [H] Art of Western Civilization 3 Historical survey of painting, sculpture, and architecture from the early Christian period through the Renaissance: 4th century A.D. through 16th century A.D.
203 [H] Art of Western Civilization 3 Historical survey of painting, sculpture, and architecture from the 17th century to the present.
204 [H] Mexican Art History 3 The history of the art of Mexico from 3000 B.C. to present.
205 Native American Arts 3 A survey of the arts and crafts of Native Americans.
300 [H] Medieval Art 3 Painting, sculpture, and architecture from 5th century A.D. to 14th century A.D.
301 [H] The Classical Heritage in Western Art 3 Prereq F A 201 or 202. The influence of the classical heritage of Greece and Rome on later western civilizations down to the 20th century.
302 [H] Renaissance Art 3 Prereq F A 202. Painting, sculpture, and architecture in western Europe from the 14th through the 16th century.

303 [H] Modern Art 3 Painting, sculpture, and architecture from 19th to the 20th century.

304 [H] American Art 3 American painting, sculpture, architecture, and decorative arts from early colonial period to the present.

305 [H] Chicano Art 3 Same as Ch St 321.

310 Women Artists in History 3 Same as W St 310.

390 Introduction to Museology 3 Same as Anth 390.

500 Graduate Art History 2 May be repeated for credit; cumulative maximum 6 hours. Prereq 9 hrs undergraduate art history.

**Studio Courses**

Note: unless specified, media used in studio courses are at the option of the instructor.

**Drawing**

110 Drawing 3 (0-6) Composition in pictorial space, visualization of ideas, drawing from life.

111 Figure Drawing 3 (0-6)

312 Drawing 3 (0-6) May be repeated for credit. Prereq F A 103, 110 or 111.

313 Figure Drawing 3 (0-6) May be repeated for credit. Prereq F A 103, 111.

510 Graduate Drawing 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

511 Graduate Drawing 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

512 Graduate Drawing 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

**Painting**

320 Beginning Painting 3 (0-6) Basic painting; introduction to composition and color structure.

321 Painting 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Prereq F A 320.

322 Transparent Watercolor 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Prereq F A 320.

423 Advanced Painting V 3 (0-6) or 6 (0-12) May be repeated for credit. Prereq F A 321. F A majors only.

520 Graduate Painting 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

521 Graduate Painting 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

522 Graduate Painting 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

**Graphic Design**

331 Graphic Design 3 (0-6) Introduction to visual communication.

332 Graphic Design 3 (0-6) Prereq F A 103, 110 or 111, 331.

433 Illustration V 3(0-6) or 6 (0-12) May be repeated for credit. Prereq F A 111, 320. Editorial, scientific, and advertising. F A majors only.

434 Graphic Design V 3 (0-6) or 6 (0-12) May be repeated for credit. Prereq F A 331, 332. F A majors only.

495 Graphic Design Internship V 8-12 Prereq F A 434; major in F A. Practical field experience.

530 Graduate Graphic Design 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

531 Graduate Graphic Design 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

532 Graduate Graphic Design 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

**Ceramics**

340 Ceramics 3 (0-6) Forming processes; the potter's wheel; glazing; firing.

341 Ceramics 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Prereq F A 340.

442 Ceramics V 3 (0-6) or 6 (0-12) May be repeated for credit. Prereq F A 341. F A majors only.

540 Graduate Ceramics 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

541 Graduate Ceramics 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

542 Graduate Ceramics 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

**Sculpture**

350 Sculpture 3 (0-6) Manipulation of form in three dimensional space.

351 Sculpture 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Prereq F A 350.

185
Department of Fine Arts

452 Sculpture V 3 (0-6) or 6 (0-12) May be repeated for credit. Prereq F A 351. F A majors only.

550 Graduate Sculpture 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

551 Graduate Sculpture 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

552 Graduate Sculpture 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

Metalworking

360 Metalworking 3 (0-6) Small metal sculpture and jewelry design.

361 Metalworking 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Prereq F A 360.

462 Metalworking V 3 (0-6) or 6 (0-12) May be repeated for credit. Prereq F A 361. F A majors only.

560 Graduate Metalworking 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

561 Graduate Metalworking 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

562 Graduate Metalworking 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

Printmaking

370 Printmaking 3 (0-6) May be repeated for credit; cumulative maximum 9 hours. Prereq F A 103, 110 or 111.

471 Printmaking V 3 (0-6) or 6 (0-12) May be repeated for credit. Prereq F A 370. F A majors only.

570 Graduate Printmaking 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

571 Graduate Printmaking 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

572 Graduate Printmaking 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

Photography

380 Introduction to Photography 3 An experience with cameras and associate materials and techniques; photography in an historical and aesthetic context.

381 Photography 3 (0-6) Prereq F A 103, 110 or 111. Beginning darkroom techniques.

382 Photography 3 (0-6) Prereq F A 381.

483 Photography V 3 (0-6) or 6 (0-12) May be repeated for credit. Prereq F A 382. F A majors only.

580 Graduate Photography 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

581 Graduate Photography 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

582 Graduate Photography 3 (0-6) May be repeated for credit; cumulative maximum 9 hours.

Art Education

389 Art Media for Schools 3 (0-6) Required in art education. Experiences in a variety of media utilized in public schools.

Gallery Procedures

490 Gallery Procedures V 3 (0-6) to 6 (0-12) May be repeated for credit; cumulative maximum 9 hours. Gallery concepts and management; budget, installation designs, art handling, graphics, art publication, and films.

Special Topics, Seminars, and Thesis

400 Special Topics V 1-6 May be repeated for credit; cumulative maximum 18 hours.

492 Designing Art Programs for the Public Schools 3 Same as Educ 492.

498 Seminar 2 May be repeated for credit; cumulative maximum 4 hours. For juniors and seniors in F A. Required for F A majors.

499 Special Problems V 1-4 May be repeated for credit.

598 Graduate Seminar 2 May be repeated for credit; cumulative maximum 4 hours.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

Schedule of Studies

For a bachelor's degree in fine arts a total of at least 53 hours of fine arts are required, 20 of these hours must be in upper-division courses.

Required Courses:

All art majors are required to have completed the following courses or their equivalents:

Foundation
F A 102, 103—4 hours.
Art History  
F A 201, 202, 203, 303—12 hours.
Drawing  
F A 110, 111—6 hours.
Painting  
F A 320—3 hours.
Sculpture  
F A 350—3 hours.
3-D studio in addition to F A 350—3 hours.
Seminar  
F A 489—2 hours.

Note for Secondary School Program in Art Education: Required courses in F A students (33 hours); 14 hours F A electives; F A Educ 389; Educ 492. Recommended electives for F A/Educ majors: F A 360, 340, 370, and 130.

ART MINOR  
F A 102 F A Orientation 1
F A 103 Art 3
F A 110 Drawing 3
F A 303 Modern Art 3
Upper-division electives 9
Total 19

Food science is the profession and field of study in which the biological and physical sciences are used to learn the nature of foods, the causes of their deterioration or spoilage, and the principles underlying processing and improvement of foods for the consuming public. Food technology is the application of food science to the selection, preservation, processing, packaging, distribution, and use of food commodities.

The undergraduate curriculum of the department closely follows the recommendations of the national professional organization, the Institute of Food Technologists, and provides the student with a working knowledge of both food science and food technology. The curriculum also provides an introduction to the modern processing technology applicable to four principal food commodity groups significant in the economy of the state. These are cereal, fruit and vegetable, meat and poultry, and milk products. Through choice of electives and summer work experience students may strengthen their training in one or more of these areas. A graduate may choose a career with industry or government in quality control, product development, research, process supervision, enforcement and consumer protection, and teaching.

The department offers courses of study leading to the degrees of Bachelor of Science in Food Science and Technology, Master of Science in Food Science, and Doctor of Philosophy (Food Science).

Exchange Program  
The Department of Fine Arts has a tuition free exchange for four students with the School of Fine Arts at Nihon University, Tokyo, Japan. All art majors at WSU are eligible for this one-year study in Japan. Selection is made in the winter.

Preparation for Graduate Study  
The Fine Arts Department Graduate Program offers the MFA degree in two-dimensional studio arts and in three-dimensional studio arts. The student may place major or minor emphasis in any of the following areas: Drawing, Graphic Design, Painting, Photography, Printmaking, Ceramics, Metalworking, and Sculpture.

Department of Food Science and Technology  
Associate Professor and Acting Department Chair, C. J. Brekke; Professors, D. M. Lee, L.

O. Luadecke, C. W. Nagel; Associate Professors, H. K. Leung, B. G. Swanson; Assistant Professors, J. R. Powers, S. E. Spayd.

For explanation see Index under "Symbols"
uct manufacturing and marketing. Field trip required.

302 (473) Meat and Poultry Products 3 (2-3) Prereq Bact 101 or 201; Org Chem. Specialized techniques and practices of meat, poultry, and egg processing and marketing. Field trip required.

303 (471) Fruit and Vegetable Products 3 (2-3) Prereq Bact 101 or 201; Org Chem. Specialized techniques and practices of fruit and vegetable processing and marketing. Field trip required.

304 (474) Cereal Products 2 Prereq Org Chem. Technical principles relating to the production and commercial processing of legume and cereal foods. Field trip required.

305 Quality Milk Production 2 Prereq one sem Bio S. Various factors affecting milk quality during production and methods of evaluation used in commercial practice. (a/y)

401 Topics in Food Science V 1-3 May be repeated for credit; cumulative maximum 6 hours. Selected topics in food science and technology. Credit not granted for both F S 401 and 501.

416 Microbiology of Food 3 (2-3) Same as Bact 416.

433 Agricultural Processing 3 Prereq Ag M 210 or Math 140; Phys 101. Principles of heat transfer, steam, air-vapor mixtures, refrigeration and fluid flow as applied to commodity processing and storage.

434 Food Engineering Laboratory 1 (0-3) Prereq F S 433 or c/. Experiments in heat transfer, fluid flow and dehydration.

450 Food Fermentations 3 (2-3) Prereq microbiology; Org Chem. Principles and procedures of fermentation of fruits, vegetables, meat products, and dairy products. Credit not granted for both F S 450 and 550. (a/y)

470 Advanced Food Technology 3 Prereq F S 416, 453 or c/. Physical principles of food preservation and recent advances in food technology. Credit not granted for both F S 470 and 570.

480 (370) Food Chemistry 3 Prereq Org Chem and Biochem. Fundamentals of food chemistry; composition of foods and the changes that occur during processing.

481 Food Chemistry Laboratory 1 (0-3) Prereq F S 480 or c/. Experiments related to the properties, reactions, and interactions of chemical components of foods.

482 (371) Food Analysis 4 (2-6) Prereq Chem 217; one sem Bact. Introductory food analysis; methods common to many food commodities.

487 Food Process Engineering 3 Same as Ag E 487. Credit not granted for both F S 487 and 587.

495 Internship in Food Science and Technology 2 May be repeated for credit; cumulative maximum 4 hours. Not open to freshmen. Students work full time in industrial assignments with prior approval of adviser and industrial supervisor.

499 Special Problems V 1-4 May be repeated for credit.

501 Topics in Food Science V 1-3 May be repeated for credit; cumulative maximum 6 hours. Graduate level counterpart of F S 401; additional requirements. Credit not granted for both F S 401 and 501.

502 Seminar—Written 1 May be repeated for credit. Development of skills in writing and reporting current food science research.

503 Seminar—Oral 1 May be repeated for credit. Development of skills and communication tools and techniques for oral presentations of current food science research.

510 Advanced Food Chemistry 3 Prereq Chem 364. Chemical, physical, and toxicological properties of water, vitamins, pigments, synthetic colors, minerals, miscellaneous food additives, and natural toxicants. (a/y)

511 Food Carbohydrates, Lipids, and Proteins 3 Prereq Chem 364. Occurrence structure, properties, and functions of carbohydrates, lipids, and proteins in foods. (a/y)

522 Food Quality Evaluation 3 (2-3) Same as HNF 522. (a/y)

550 Food Fermentations 3 (2-3) Graduate level counterpart of F S 450; additional requirements. Credit not granted for both F S 450 and 550.

570 Advanced Food Technology 3 Graduate level counterpart of F S 470; additional requirements. Credit not granted for both F S 470 and 570.

580 Physical Properties of Foods 2 Prereq Math 140; F S 433. Thermodynamics, rheology, thermal and mass transfer
properties of foods as related to food processes and quality. (a/y)

587 Food Process Engineering 3 Same as Ag E 587. Graduate level counterpart of F S 487; additional requirements. Credit not granted for both F S 487 and 587.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

General Departmental Requirements

The following schedules set forth the general requirements for the two departmental undergraduate options. General University Requirements are met in the department requirements listed for both options. Students should consult their advisers for the appropriate sequencing of courses as well as for the selection of electives that best suit their needs and interests. Illustrative programs are available from the department.

At least 40 of the total hours required for the bachelor's degree in these programs must be in upper-division courses.

Science Option

This option has been developed for the student who is interested in the science of food processing. Emphasis is placed on the scientific aspects of processing and offers more laboratory analyses experience.

**Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>F S 170, 301, 302, 303, 304, 416, 433, 434, 450, 470, 480, 481, 482, 502, 522</td>
<td>37</td>
</tr>
<tr>
<td>Ag E 201, 350</td>
<td>6</td>
</tr>
<tr>
<td>Chem 105, 106, 107, 217, 240, BC/BP 364</td>
<td>20</td>
</tr>
<tr>
<td>Bio S 103; Bact 201</td>
<td>9</td>
</tr>
<tr>
<td>Biom 412</td>
<td>3</td>
</tr>
<tr>
<td>A S 301 or HNF 333</td>
<td>3</td>
</tr>
<tr>
<td>Engl 101; 201 or 301; 402; Spe 102 or 302</td>
<td>12</td>
</tr>
<tr>
<td>Phys 101, 102</td>
<td>8</td>
</tr>
<tr>
<td>Math 140</td>
<td>4</td>
</tr>
<tr>
<td>Humanities Electives</td>
<td>6</td>
</tr>
<tr>
<td>Soc S Elective</td>
<td>3</td>
</tr>
<tr>
<td>A S 101, Hort 201, 320, or Agron 201</td>
<td>3</td>
</tr>
</tbody>
</table>

Total hours specified 114

Other electives 6

**Business Option**

This option has been developed for the student who wants to obtain business and management courses in addition to the basic food processing courses.

**Requirements**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>F S 170, 301, 302, 303, 304, 416, 433, 434, 450, 480, 481, 502, 522</td>
<td>30</td>
</tr>
<tr>
<td>Chem 101, 102, 240; BC/BP 364</td>
<td>15</td>
</tr>
<tr>
<td>Math 140; Phys 101</td>
<td>8</td>
</tr>
<tr>
<td>Bio S 103; Bact 201</td>
<td>9</td>
</tr>
<tr>
<td>Biom 412 or QMeth 215</td>
<td>3-4</td>
</tr>
<tr>
<td>Ag Ec 201, 350, 360</td>
<td>9</td>
</tr>
<tr>
<td>HNF 130 or A S 301 or HNF 333</td>
<td>3</td>
</tr>
<tr>
<td>Engl 101; 201 or 301; 402; Spe 102 or 302</td>
<td>12</td>
</tr>
<tr>
<td>Hum Electives</td>
<td>6</td>
</tr>
<tr>
<td>Soc S Elective</td>
<td>3</td>
</tr>
<tr>
<td>A S 101, Hort 201, 320, or Agron 201</td>
<td>3</td>
</tr>
<tr>
<td>B Law 210, Acctg 230, 231 or Cpt S 150; 153 or 154; Psych 306 or Mgt 301</td>
<td>13</td>
</tr>
</tbody>
</table>

Total hours specified 114

Other Electives 6

**Recommended Electives**

**Food Production:** A S 101, Hort 201, 311, 320; Agron 203.

**Engineering:** Math 171", 172”; Phys 201", 202”; C E 341, 342; Ch E 301, 302, 401, 402.

**Nutrition:** HNF 130, 333, 434.


*“substitute for Math 140.

*“substitute for Phys 101, 102.

*“substitute for Chem 240.

**MINOR IN FOOD SCIENCE AND TECHNOLOGY**

A minor requires a minimum of 16 semester hours, half of which must be in upper-division courses. Required courses: F S 416, 480, 481.

**Preparation for Graduate Study**

Students who plan work toward an advanced degree should elect courses which will support their minor area of interest or strengthen their major. Consultation with their adviser will be found most helpful.
Department of Foreign Languages and Literatures

Knowledge of languages in addition to English is essential in the modern world of rapid communication, international business, and multinational ventures in science and technology. The Department of Foreign Languages and Literatures attempts to help students prepare themselves for full participation in the world community by offering a wide range of classes in language, literature, and culture.

Courses are offered regularly in Chinese, Greek, Italian, Japanese, Latin, Swahili, and Swedish. Majors are available in French, German, Russian, and Spanish. Languages such as Hindi, Sanskrit, and others may be offered as warranted by student interest and staff available from the departmental office.

The department’s curriculum is structured to allow entry on any level. Students who begin language study in the public schools or at another institution may continue here at their level of competence without loss of time. Specifically, the courses in this department serve several purposes. They (1) enable students to gain proficiency in their target language and to appreciate the literature and culture of that language; (2) give language training for careers which require it; (3) provide a continuing service to students of other departments by helping them to learn to read foreign publications in their fields of interest; and (4) prepare future foreign language teachers.

Two modern language laboratories are available for individual use by students with their own tapes or departmental tapes. The laboratories are also connected to the University Dial Access System, which enables students to utilize the laboratories’ services by telephone.

Recognizing the need for students to reinforce in a practical way knowledge gained in the classroom, the department sponsors a wide variety of supplementary activities. All students are eligible to participate in the German Choir and French Cabaret. In addition, Fiesta Latina, Deutscher Abend, and Serata Italiana are open to students of those languages. The maison francaise, a living group where only French is spoken and where conversational activities are supervised by a resident native speaker, is open to students of sophomore standing and above. Similar living arrangements for students of German are currently under active preparation. Visiting lecturers, foreign film showing, and performances of plays by professional companies from abroad as well as by WSU foreign language students supplement the classroom experience.

Two departmental scholarship funds provide foreign language majors with one scholarship covering tuition and fees and several smaller scholarships annually. They are awarded to qualified majors of junior or senior standing.

The department offers courses of study leading to the degrees of Bachelor of Arts in Foreign Languages and Literatures and Master of Arts in Foreign Languages and Literatures. The department also participates in the interdepartmental Program in Literary Studies leading to the degree of Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Foreign Language

For L

111 [H] Introduction to World Folk Literature: Asia and Africa 3 Readings in folktales, ballads, customs, and beliefs from selected cultural or geographical areas of Africa and Asia.

112 Introduction to World Folk Literature: Europe 3 Readings in folktales, ballads, customs, and beliefs from selected cultural or geographical areas of Europe.

300  Studies in Foreign Languages V 1-4 May be repeated for credit. Languages not currently a part of the curriculum may be offered on demand.

301  Spoken Swahili I 4 Same as Bl St 301.

302  Spoken Swahili II 4 Same as Bl St 302.

303  Elementary Hindi 4 Basic structure; reading and conversational skills; core vocabulary. (a/y)

304  Elementary Hindi 4 Prereq For L 303. Continuation of For L 303. (a/y)

310  [H] Eastern Civilization and Literature 3 The development of Asian civilization as expressed through literary and cultural aspects.
324 Methods of Teaching Foreign Languages 3 Prereq 2 yrs foreign language.
350 [S] Speech, Thought, and Culture 3 Same as Anth 350.
352 [H] Literature and Lore of South Asia 2 May be repeated for credit. Lectures and readings in English of selected topics and writers.
410 Racism and Sexism in Language 3 Uses and misuses of color/race and sex in language and literature.
426 Applications of Linguistics to the Teaching of Foreign Languages 3 Prereq 304 language course. Contemporary linguistic principles applied to the teaching of foreign languages. (a/y)
450 Descriptive Linguistics I 3 Same as Anth 450.
456 Historical Linguistics 3 Same as Anth 456.
499 Special Problems V 1-4 May be repeated for credit.
591 Seminar in Literary Studies 3 Same as Engl 591.
597 Seminar in Scholarly Methodology 2 Bibliography and formal aspects of scholarly writing; general introduction to literary criticism.
600 Special Projects or Independent Study Variable credit.
700 Master’s Research, Thesis, and/or Examination Variable credit.
702 Master’s Special Problems, Directed Study, and/or Examination Variable credit.
800 Doctoral Research, Dissertation, and/or Examination Variable credit. (for PhD in literary studies only)

Chinese

Chin
301 First Semester 4 Fundamentals of speaking, reading, and writing.¹
302 Second Semester 4 Prereq Chin 301. Continuation of Chin 301.¹
303 Intensive Chinese 10 (5-15) Provides active knowledge of listening to, speaking, reading, and writing Chinese. For students with little or no experience in Chinese. Open to undergraduate and graduate students.¹
320 Chinese Conversation 2 May be repeated for credit; cumulative maximum 6 hours. Prereq Chin 302. Intensive practice in speaking modern Chinese.¹

350 Chinese Literature in English 2 May be repeated for credit; cumulative maximum 6 hours. Lectures and readings in English of selected topics and writers.

Classics

Clas (new prefix; changed from Latin)
101 Beginning Latin 4 For students who have had no Latin or who need a review course before taking advanced work.
102 Selections from Latin Prose and Poetry 4 Prereq Clas 101.
299 Readings from Latin and Conferences V 1-4 May be repeated for credit. Prereq Clas 102.

French

Fren
101 First Semester French 4 Elementary French; understanding and speaking.¹
102 Second Semester French 4 Prereq Fren 101.¹
203 [H] Third Semester French 4 Prereq Fren 102. Intermediate French; systematic grammar review and development of all skills.¹
303 Intensive French 10 (5-15) Provides active knowledge of understanding, speaking, reading, and writing French. For students with little or no experience in French. Open to undergraduate and graduate students.¹
304 [H] Introduction to Advanced French Studies 4 Prereq Fren 203. Selected French texts in cultural context; continued practice in spoken and written French.²
315 [H] French Civilization—Early Period 2 Lectures and readings in English on the cultural history of France and ancient times to the death of Louis XIV.
316 [H] French Civilization—Modern Period 2 Lectures and readings in English on the cultural history of France from the beginning of the Age of Enlightenment to modern times.
322 French Composition 3 Prereq Fren 304. Systematic practice in writing French.
323 French Conversation 3 Prereq Fren 304. Systematic practice in speaking French.¹
330 Advanced Intensive French for Undergraduate Students 6 (3-9) Prereq Fren 303. Continuation of Fren 303.
333 [H] Survey of French Literature to 1700 3 Prereq Fren 304. Transitional course shifting emphasis from language to literature.

¹Not open to native speakers.
334 [H] Survey of French Literature after 1700 3 Prereq Fren 304.
350 [H] French Literature in English 2 May be repeated for credit. Lectures and readings in English of selected topics and writers.
401 Advanced French Conversation 1 (0-3) May be repeated for credit; cumulative maximum 4 hours. Prereq Fren 322 or 323. Intensive oral practice in small groups.
415 Introduction to French-Canadian Culture 2 Prereq Fren 322, 323, 333, or 334. An introduction to the history, arts, and literature of French-Canadian. (a/y)
416 Seminar in French Civilization 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Fren 322, 323, 333, or 334.
421 (425) French Literature of the Seventeenth Century 3 Prereq Fren 322, 323, or 333. Selected works and authors; the classical period. (a/y)
422 Advanced French Grammar and Syntax 2 Prereq Fren 322 or 323. Fluency and accuracy developed.
423 Pronunciation and Phonetics 2 Prereq Fren 322 or 323. A practical approach to French phonetics; pronunciation and diction; special problems.
431 (432) French Literature of the Eighteenth Century 3 Prereq Fren 322, 323, or 334. French Enlightenment; selected writings of Montesquieu, Voltaire, Diderot, Rousseau, and others. (a/y)
441 French Literature of the Nineteenth Century 3 Prereq Fren 322, 323, or 334. Authors and movements of the century; the Romantic, Parnassian, and Symbolist poets.
442 French Literature of the Nineteenth Century 3 Prereq Fren 322, 323, or 334. Authors and movements of the century; the Romantic, Realist, and Naturalist prose writers.
451 French Literature of the Twentieth Century 3 Prereq Fren 322, 323, or 334. Authors and movements from the early 1900's to 1930; Gide, Proust, Generation of 1920; neosymbolism and Catholic poetry. (a/y)
452 French Literature of the Twentieth Century 3 Prereq Fren 322, 323, or 334. Contemporary authors and movements; pre-surrealism, Apollinaire, contemporary poetry; new theater, existentialism, nouvelle roman, modern critics and essays. (a/y)
480 Seminar in French Language or Literature 3 May be repeated for credit. Prereq Fren 322, 323, 333, or 334.
499 Special Problems V 1-4 May be repeated for credit.
501 (500) Seminar in Old French 3 Selected works and authors from the earliest texts to 1500. (a/y)
511 French Literature of the Sixteenth Century 3 Selected works of the French Renaissance period. (a/y)
522 Stylistics 2 Near-native ability developed through a comprehensive study of French style.
523 History of the French Language 3 Phonological, morphological, semantic, and syntactic development of the French language from Vulgar Latin to the present. (a/y)
525 Intensive French for Graduate Students 10 (5-15) Prereq 1 yr college Fren. Provides active knowledge of the four language skills. Satisfactory completion may fulfill language requirements.
530 Advanced Intensive French for Graduate Students 6 (3-9) Prereq Fren 303. Continuation of Fren 303.
551 (550) Seminar in Twentieth Century French Literature 3 May be repeated for credit; cumulative maximum 6 hours.
580 Graduate Seminar 3 May be repeated for credit.
598 Seminar in the Teaching of French 1 May be repeated for credit; cumulative maximum 4 hours. Theory, problems, and methods of teaching French at the college level.
600 Special Projects or Independent Study Variable credit.

German

Ger
101 First Semester German 4 Fundamentals of speaking, reading, and writing German.1
102 Second Semester German 4 Prereq Ger 101.1
103 Guten Tag I 1 (0-2) Film program for enrichment in basic German.2
104 Guten Tag II 1 (0-2) Film program

1Not open to native speakers.
2Will not satisfy foreign language requirements of College of Sciences and Arts.
for enrichment in basic German; continuation of 103.  

203 [H] Third Semester German 4 Prereq Ger 102. Cultural readings and expansion of grammatical concepts.  

303 Intensive German 10 (5-15) Provides active knowledge of listening to, speaking, reading, and writing German. For students with little or no experience in German. Open to undergraduate and graduate students.  

304 [H] Intermediate German 4 Prereq Ger 203. Selected German texts in a cultural context; continued practice in spoken and written German.  

315 [H] Germanic Civilization 2 The cultural development of the Germanic peoples to 1750; readings, lectures, and discussions in English.  

316 [H] German Culture and Civilization 2 The cultural development of Germany from 1750 to the present; readings, lectures, and discussions in English.  

322 Composition and Conversation 3 Prereq Ger 304. Intensive practice in speaking and writing formal German.  

323 Composition and Conversation 3 Prereq Ger 304. Continuation of intensive practice in conversation and formal writing skills.  

333 [H] Introduction to German Literature 3 Prereq Ger 304. Transitional course shifting emphasis from language as such to literature.  

334 [H] The German Novelle 3 Prereq Ger 304.  

350 [H] German Literature in English 2 May be repeated for credit. Readings, lectures, and discussions in English of selected topics and writers.  

401 Informal German Conversation 1 May be repeated for credit; cumulative maximum 4 hours. Prereq Ger 304. Intensive oral practice in small groups.  

420 Advanced Composition and Conversation 3 Prereq Ger 322 or 323. Development of proficiency in writing skills; emphasis on fluency and accuracy.  

432 German Literature of the Enlightenment and Storm and Stress 3 Prereq Ger 304. The works of Lessing, young Goethe, young Schiller, and others.  

433 The German Classical Period 3 Prereq Ger 304. Reading from the later works of Goethe, Schiller, and others. (a/y)  

442 German Drama of the Nineteen Century 3 Prereq Ger 304. The works of Kleist, Buechner, Hebbel, Grillparzer, and others.  

451 German Literature from 1880 to First World War 3 Prereq Ger 304. The works of Hauptmann, Hofmannsthal, Kafka, Mann, Rilke, and others.  

452 German Literature from the First World War to the Present 3 Prereq Ger 304. The works of Hesse, Mann, Brecht, Zuckmayer, Grass, Durrenmatt, Frisch, and others.  

460 German Poetry 3 Prereq Ger 304. Introduction to German poetics through a study of German lyrics and ballads.  

480 Seminar in German Language or Literature 3 May be repeated for credit. Prereq Ger 304.  

499 Special Problems V 1-4 May be repeated for credit.  

521 Syntax and Stylistics 2 Advanced composition; development of German prose style. (a/y)  

523 History of the German Language 3 Phonological, morphological, semantic, and syntactic development of German from the earliest time to present. (a/y)  

525 Intensive German for Graduate Students 10 (5-15) Prereq 1 yr college German. Provides active knowledge of the four language skills. Satisfactory completion may fulfill language requirements.  

540 Goethe 3 A comprehensive examination of Goethe's life and works.  

543 German Romantic Movement 3 Literary, aesthetic, and philosophic writings of the Romantic period. (a/y)  

580 Graduate Seminar in German Language and Literature 3 May be repeated for credit.  

598 Seminar in the Teaching of German 1 May be repeated for credit; cumulative maximum 2 hours. Theory, problems, and methods of teaching German at the college level.  

600 Special Projects or Independent Study Variable credit.  

Hindi  
For L  
303 Elementary Hindi 4 Basic structure; reading and conversational skills; core vocabulary. (a/y)  

304 Elementary Hindi 4 Prereq For L 303. Continuation of For L 303. (a/y)
Italian

101 First Semester Italian 4 Fundamental principles of Italian; the spoken language.¹

102 Second Semester Italian 4 Prereq Ital 101. Continuation of Ital 101.¹

303 Intensive Italian 10 (5-15) Provides active knowledge of listening to, speaking, reading, and writing Italian. For students with little or no experience in Italian. Open to undergraduate and graduate students.

Japanese

301 Japanese I 4 Fundamentals of speaking, reading, and writing.¹

302 Japanese II 4 Prereq Japn 301. Continuation of Japn 301.¹

303 Intensive Japanese 10 (5-15) Provides active knowledge of listening to, speaking, reading, and writing Japanese. For students with little or no experience in Japanese. Open to undergraduate and graduate students.¹

401 [H] Japanese III 4 Prereq Japn 302. Conversation and reading of selected texts.¹

Russian

101 First Semester Russian 4 Fundamentals of speaking, reading, and writing Russian.¹

102 Second Semester Russian 4 Prereq Rus 101. Continued development of basic skills in reading, writing, and speaking Russian.¹

203 [H] Third Semester Russian 4 Prereq Rus 102. Extended study of basic grammar; conversational Russian; reading of excerpts from literature.

303 Intensive Russian 10 (5-15) Provides active knowledge of understanding, speaking, reading, and writing Russian. For students with little or no experience in Russian. Open to undergraduate and graduate students.¹

304 [H] Intermediate Russian 4 Prereq Rus 203. Reading, writing, and speaking modern Russian; structure and linguistic characteristics; introduction to Russian literature; discussions in Russian.¹

315 [H] Russian Civilization 3 Russian culture taught in English with readings and lectures in English.

320 Russian Conversation I 2 (0-6) Prereq

¹Not open to native speakers.

Rus 304. Laboratory practice to improve aural-oral skills and perfect pronunciation.¹

321 Russian Conversation II 2 (0-6) Prereq Rus 304.¹

350 [H] Russian Literature in English 2 May be repeated for credit. Not open to freshmen. Russian prose, poetry, and drama in English translation; 19th and early 20th centuries; Soviet Period.

380 Seminar in Russian 3 May be repeated for credit; cumulative maximum 6 hours. Application and elaboration of basic principles of the language.

471 Russian Literature of the Soviet Period 3 Prereq Rus 304. Representative examples of Russian prose written in the USSR after 1920.

480 Seminar in Russian Language or Literature 3 May be repeated for credit. Russian and Slavonic area.

499 Special Problems V 1-4 May be repeated for credit.

600 Special Projects or Independent Study Variable credit.

Spanish

101 First Semester Spanish 4¹

102 Second Semester Spanish 4 Prereq Span 101.¹

198 Beginning Spanish Honors 4 Prereq language aptitude test. Spanish language skills and cultural appreciation of Spanish speaking people.¹

199 Continuing Spanish Honors 4 Prereq Span 198.¹

203 [H] Third Semester Spanish 4 Prereq Span 102.¹

303 Intensive Spanish 10 (5-15) Provides active knowledge of listening to, speaking, reading, and writing Spanish. For students with little or no experience in Spanish. Open to undergraduate and graduate students.¹

304 [H] Introduction to Advanced Spanish Studies 4 Prereq Span 203. Reading and discussion of selected Spanish texts in a cultural context; brief grammar review.¹

315 [H] Hispanic Civilization 3 Spanish culture with lectures and reading in English.

316 [H] Hispanic American Culture 3 Spanish-American culture with lectures and readings in English.

320 Spanish Conversation 1 (0-3) May be repeated for credit; cumulative maxi-
451 Spanish Literature Since 1920 3 Prereq Span 304.

471 Nineteenth Century Spanish American Literature 3 Prereq Span 304. Selected readings from independence to modernism.

472 Spanish-American Literature of the Twentieth Century 3 Prereq Span 304. Selections for the drama, poetry, the essay and the short story.


480 Seminar in Spanish Language or Literature 3 May be repeated for credit. Prereq Span 304.

499 Special Problems V 1-4 May be repeated for credit.

500 Seminar in Golden Age Literature 3 Prereq Span 304. Reading and discussion of representative works of the Spanish Golden Age.

501 Medieval Spanish Literature 3 Prereq Span 304. Important works of medieval Spanish literature. (a/y)

524 History of the Spanish Language 3 Prereq Span 304. Development of the Spanish language from the beginning to the present. (a/y)

530 Advanced Intensive Spanish for Graduate Students 6 (3-9) Continuation of Span 303.


580 Graduate Seminar 3 May be repeated for credit. Prereq Span 304.

598 Seminar in the Teaching of Spanish 1 May be repeated for credit; cumulative maximum 4 hours. Theory, problems, and methods of teaching Spanish at the college level; resources and materials.

600 Special Projects or Independent Study Variable credit.

Swahili

For L

301 Spoken Swahili I 4 Same as Bl St 301.

302 Spoken Swahili II 4 Same as Bl St 302.

Swedish

Sved

301 First Semester Swedish 4 Speaking, reading, and writing Swedish.

302 Second Semester Swedish 4 Continuation of Sved 301.

303 [H] Third Semester Swedish 3 Prereq Sved 302. Grammar review and devel-
opment of reading and speaking skills.¹

350 (H) Scandinavian Literature in English
2 May be repeated for credit. Scandinavian
literature from Ibsen and Strindberg to the present.

¹Not open to native speakers.

**Schedule of Studies**

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

A minimum of 26 hours (beyond 203) or the equivalent in competence in the major language is required for a Bachelor of Arts degree in Foreign Languages and Literatures. In addition, each major must present either (1) competence in a second foreign language, up to and including 304 or the equivalent, (2) related work from another field or a teaching minor, or (3) a second major in another field.

In the junior and senior years students should take from 2 to 8 hours in their major language each semester as their individual program requires.

**Minimal Requirements for Each Major**

French: 304, 322, 323, 333, 334, 423, plus 8 hours from 315 or 316, 401 (maximum 2 hrs), 415, 416, 422, 421, 431, 441, 442, 451, 480.

German: 304, 315, 322 or 323, 334, 420, plus 11 hours from 316, 333, 401 (maximum 1 hr), 432, 433, 442, 451, 452, 460, 480.

Russian: 304, 315 plus 19 hours from 320, 321, 380, 471, 480, 499.


**Minimal Requirements for Each Minor**

To fulfill requirements for a minor in Foreign Languages and Literatures a student must present a minimum of 16 hours of course work in one language area, of which a minimum of 6 hours above the 304-level (or its equivalent) must be taken in residence; these 6 hours must include at least 3 hours in the target language. Upper-division courses graded P/F may not be included for credit toward the minor.

**Preparation for Graduate Study**

Students who contemplate graduate work in the Department of Foreign Languages and Literatures should present an undergraduate degree similar to those described in the above schedule of studies. Complete details on graduate programs are available from the chair of the department.

**AREA STUDIES**

The area studies curriculum (Latin America, Western European, and Eastern European Studies) permits students interested in a particular region of the world to follow a course of study concentrating on the language, literature, history, politics, geography, economics, and general culture of that area. Complete details are available from the department. Through careful choice of electives and of courses meeting General University Requirements, a student may obtain sufficient concentration to prepare for graduate study in several fields or to enhance a wide variety of career possibilities.

**TEACHER-TRAINING PROGRAM**

Students preparing to teach should consult the catalog listing of the Department of Education for certification requirements and for teaching majors and minors. Those who intend to major in foreign languages and education should begin the study of the major language in the first year and of the minor language, if any, not later than the beginning of the second year.

**INTENSIVE COURSES**

To meet the specific needs of those students who wish to achieve a degree of fluency within a brief time period, the department offers highly successful intensive courses in French, German, Japanese, Russian, and Spanish each summer. Students devote eight hours per day, five days a week, for a period of eight weeks to formal language instruction.
Bunderson, D. L. Scarnecchia, J. A. Tiedeman, D. J. Weatherhead.

The department offers programs in forest management, range management, and wildland recreation leading to the degrees of Bachelor of Science in Forest Management, Bachelor of Science in Range Management, and Master of Science in Forest and Range Management.

The department also participates in interdepartmental programs leading to the degrees of Bachelor of Science in Environmental Science and Master of Science in Environmental Science.

**Bachelor’s Program**

The undergraduate program is designed to provide the knowledge and training necessary for a professional career managing forest and range lands. A curriculum leading to the bachelor’s degree consists of a basic core of courses plus a selected option.

The core courses include all common requirements set forth by the university, U.S. Office of Personnel Management, Society of American Foresters, Society for Range Management, and departmental faculty.

A selected option provides an opportunity for the student to fit a curriculum to his or her particular interests.

An early step in enrollment is to select the particular program to be pursued, namely: forest management, range management or wildland recreation. Before the junior year a student will choose an option to complete the basic or “core” curriculum. The options for forestry and range management are common to both, while wildland recreation has a separate set of options.

All students majoring in forest management, wildland recreation, or range management are required to successfully complete 128 hours of course work (exclusive of physical education activity courses), to earn the Bachelor of Science degree. At least 40 of the total hours required for the bachelor’s degree must be in upper-division courses.

Between the junior and senior years all students will work for a professionally oriented organization while enrolled in the summer session course, FRM 399, Professional Integration. The student, under the direction of a faculty adviser, carries out a schedule of studies and readings designed to integrate formal course work and field experience. The department assists in obtaining suitable employment to meet this requirement.

**Opportunities for Employment**

Students and graduates find opportunities for summer and permanent employment with public land management agencies and private industry.

**Description of Courses**

For explanation see Index under “Symbols”

**FRM**

100 Introduction to Forest and Range Management 1 Management of forests and rangelands; land base, basic ecological relationships, institutions, and job requirements.

275 Recreation in America 2 Same as RLS 275.

300 Professional Development I 1 Organizational structure and personnel policies of leading public and private land management agencies.

301 Forest and Range Environments 3 Prereq Bio S 103. Site factors and their effect upon forest and range vegetation.

302 Advanced Forest and Range Environments 3 (2-3) Prereq FRM 301; Bot 332. Classification systems used in characterizing Pacific Northwest forest and range communities including indicator and economically important species.

303 [B] Conservation of Renewable Resources 3 Philosophy and principles of conservation; identification of major uses of the resources; case studies to illustrate conservation practices.

304 Silviculture 3 Prereq FRM 301. Intermediate stand treatment and regeneration of the forest. Field trips required.

311 Forest Economics 3 Prereq Econ 203 or Ag Ec 201. Economic analysis applied to problems in the utilization of forest land and forest products.

312 Forest Mensuration 4 (3-3) Prereq Biom 310 or QMeth 215; Cpt S 150 and 151 or 153. Theory and application of forest measurements; estimation of growth and yield of forest trees and stands. Field trip required.

320 Timber Harvesting 3 (2-3) Prereq FRM 304 or c/. Not open to freshmen or sophomores. Current practices and problems; planning and coordinating timber harvesting with forest management.

321 Wood Structure and Properties 3 (2-3) Prereq Bio S 103. Wood anatomy; identification and uses of commercial U.S.
species; properties, defects, and variation; relation of structure and properties to utilization.

330 (230) Wildland Fire Management 3
Causes, behavior, and effects of wildland fires, techniques of prevention, suppression and suppression; uses of fire in wildland management.

331 Forest Pathology 3 (1-6) Same as Pl P 331.

348 Forest Entomology 3 (2-3)
Principles and concepts of forest entomology; integration and application of basic knowledge; processes in dealing with forest insect problems.

351 Principles of Range Management 3
Introduction, history, regions, physiological and ecological applications, measurements, interpretations, and planning.

352 Range Livestock Management 3
Prereq FRM 351. Not open to freshmen or sophomores. Range livestock management and nutrition in western grazing regions; proper use, grazing systems, water development; range improvement for livestock production. Field trips required.

354 Range Plant Communities 3 (1-6)
Prereq Bot 332. Range grasses, forbs, browse, and poisonous plants; their identification, distribution, ecology, and management; economic and nutritive value.

371 (231) Wildland Recreation 3
Not open to freshmen and sophomores. Historic development; benefits; federal, state, and local involvement; current problems and trends in the field of wildland recreation. (a/y)

372 Wildland Recreation Field Laboratory 1 (0-3)
Prereq c// in FRM 371. Field observation of recreation practices. Field trips required.

373 Interpretive Techniques 3 (2-3)
Prereq FRM 371, 572. For juniors and seniors. Fundamentals and practices in interpreting wildland biological and physical phenomena as related to public recreation. (a/y)

380 Wildlife Habitat Management 3
Prereq FRM 301 or Bio S 372. Wildlife habitat management, life histories of forest and range wildlife species, interaction of timber and livestock production with wildlife.

399 Professional Integration 1
Prereq FRM 300; major in forest management, range management or wildland recreation. Integration of summer employment in professionally directed programs with formal courses and summer reading assignments.

400 Professional Development II 1
Prereq FRM 399. Integration of summer professional experience with curriculum.

402 Forestation 3 (2-3)
Prereq FRM 301. Forest seed, nursery, planting and seedling problems. Field trips required. Credit not granted for both FRM 402 and 502.

407 Forest Populations 1
Prereq enrollment in CEFES Program. Concepts of genetics, population dynamics and pest management applied to forest management.

411 Forest Finance and Valuation 3
Prereq FRM 311. Economic and finance principles applied to forest management and appraisals.

412 Forest and Range Policy and Administration 3
Development and administration of U.S. forest and range laws and policies.

415 Forest Management 4 (3-3)
Prereq FRM 304, 312, 411. Integration of mathematical, economic, and biological principles and application of modern decision-making techniques for sustained product yield. Field trips required.

451 Range Habitat Analysis 3 (2-3)
Prereq Biom 310. Evaluating range habitat production and utilization; domestic livestock and big game range inventory procedures. Field trips required.

452 Range Development and Improvements 3 (2-3)
Prereq FRM 351. Application of recent developments and research to the planning and administration of rangeland. Field trip required.

456 Range and Ranch Planning 3 (2-3)
Prereq FRM 452; AgEc 340. Integration of principles of range science and management planning with applications of computer technology. Field trip required.

460 Watershed Management 3
Principles and practices of management of forest and rangelands for protection, maintenance, and improvement of water resource values. Credit not granted for both FRM 460 and 560.

471 Wildland Recreation Management 3 (2-3)
Prereq FRM 371, 372. Planning and management techniques applied to
wildland recreation problems and situations.

478 Wildland Recreation Planning 3 (2-3)  
Prereq FRM 371, 471. Comprehensive area and development planning for  
wildland recreation and amenities in multiple- and single-use settings.

479 Internship V 1-12 An elective opportunity for select students to supplement  
their academic training with practical field experience.

480 Big Game Habitat Management 3  
Prereq FRM 352, 380. Habitat management principles based on ecology and  
physiology of plants and animals; securing proper use, habitat rehabilitation;  
multiple use management.

499 Special Problems V 1-4 May be repeated for credit.

501 Advanced Topics in Silviculture 2 May  
be repeated for credit. Prereq FRM 304. Directed study and discussion of  
current problems of special silvicultural interest.

502 Forestation 3 (2-3) Graduate level  
counterpart of FRM 402; additional requirements. Credit not granted for both  
FRM 402 and 502.

511 Timber Supply Economics 3 Prereq  
Econ 301; FRM 311; Math 141, 171, or 202. Economic analysis of public  
and private timber supply, with particular attention to the Pacific Northwest.

515 Multiple Use Management 3 Prereq  
senior in FRM. Integration of multiple uses of forest and rangelands through  
application of modern technological, social, and mathematical principles.  
Field trip required.

516 Management of NIPF Lands in the  
Pacific Northwest 3 Prereq FRM 415. Importance, problems, and opportuni-  
ties for management of nonindustrial private forests in the Pacific Northwest.  
Field trips required. (a/y)

517 Advanced Forest Mensuration 1 Prereq  
enrollment in CEFES Program. Evaluation of forest growth and yield in forest  
ecosystem management.

519 Advanced Topics 1-3 May be repeated  
for credit; cumulative maximum 6 hours.

543 Population Management 2 (1-3) Same  
as Entom 543. (a/y)

545 Advanced Forest Environments 4 Prereq  
enrollment in CEFES Program. Meteorology, soils, and vegetation clas-  
sification of forest environments.

553 Advanced Range Plant Communities 3  
(2-3) Prereq FRM 351; Bot 462. Vegetation and site classifications for the  
Pacific Northwest rangeland; application of synecological principles and con-  
cepts to rangeland management. Field trip required. (a/y)

559 Advanced Topics in Range Management  
1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq  
FRM 452. Review of current literature and its application in range manage-  
ment.

560 Watershed Management 3 Graduate  
level counterpart of FRM 460; additional requirements. Credit not granted  
for both FRM 460 and 560.

561 Wildland Environmental Analysis 2  
(1-3) Quantitative analysis of interaction of energy exchange and site in-  
fluencing wildland productivity and management for different goods and  
services.

581 Big Game Habitat Studies 1 (0-3) Prereq  
FRM 480; c/c in FRM 519, 559, or 600. Development of big game habitat  
management decision models. Field trip over spring break required.

595 Seminar in Forestry and Range Man-  
agement 1 May be repeated for credit. Literature review; preparation and pres-  
pentation of reports in forestry and range science.

600 Special Projects or Independent Study  
Variable credit.

700 Master's Research, Thesis, and/or Ex-  
mamination Variable credit.

702 Master's Special Problems, Directed  
Study and/or Examination Variable credit.

**General Departmental Requirements**

Each of the programs in forest management, range management, and wildland recreation has a basic or "core" curriculum; to it must be added an option to be selected by the student.

**Forest Management Core Requirements**

The following curriculum meets professional standards established by the Society of American Foresters and the U.S. Office of Personnel Management.
At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses. A minimum of 128 hours (exclusive of physical education activity courses) is required for graduation.

All forestry students are required to take the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Engl 101 Composition</td>
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<tr>
<td>Spe 102 or 205</td>
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<tr>
<td>Engl 402 Tech Writing</td>
<td>3</td>
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<tr>
<td>Bio S 103 and 104 or Bot 201</td>
<td>8</td>
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<tr>
<td>Bot 332 Systematic</td>
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<tr>
<td>Cpt S 150 and 151 or 153</td>
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<tr>
<td>Chem Principles</td>
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<td>Math 107, 171, or Math 201, 202, or</td>
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<tr>
<td>Math 140, 141</td>
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<td>Econ 203 or Ag Ec 201</td>
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<td>Geol 102 Phys Geol</td>
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<tr>
<td>Soils 201 Soils</td>
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<tr>
<td>Biom 310 or QMeth 215</td>
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<tr>
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<tr>
<td>FRM 301 For &amp; Rg Envir</td>
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</tr>
<tr>
<td>FRM 302 Adv For &amp; Rg Envir</td>
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<td>FRM 304 Silviculture</td>
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<td>FRM 311 For &amp; Rg Econ</td>
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<td>FRM 312 Mensuration</td>
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<td>FRM 330 Wildland Fire Mgt</td>
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<td>FRM 411 Finance and Valuation</td>
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<td>FRM 412 Policy and Admin</td>
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<td>FRM 415 Forest Mgmt</td>
<td>4</td>
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<tr>
<td>FRM 351, 371, 380, or 460</td>
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<tr>
<td>FRM 320 Timber Harvesting</td>
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<tr>
<td>Soc S Elective</td>
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<tr>
<td>Hum Electives</td>
<td>6</td>
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</tbody>
</table>

**OPTIONS IN FOREST MANAGEMENT**

By the beginning of the junior year (60 semester hours), students in forest management are expected to have selected one of four options:

**Management.** C E 101; FRM 320, 331, 348; two additional courses from FRM 351, 371, 380, 460; electives approved by adviser.

**Science.** Bot 320, 462; Chem 240, FRM 331, 348; GenCB 301; electives approved by adviser.

**Wildlife Habitat Management.** FRM 351, 352, 451, 380, 480; Zool 224; 12 credits zoology and wildlife electives approved by adviser.

**Directed Studies.** 24-29 hours related course work approved by adviser and the department chairperson, of which three-fourths of the hours are to be 300- and 400-level courses.

**Range Management Core Requirements**

The following curriculum meets standards established by the U.S. Office of Personnel Management.

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses. A minimum of 128 hours (exclusive of physical education activity courses) is required for graduation.

All range students are required to take the following courses:

<table>
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<tr>
<th>Course</th>
<th>Hours</th>
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<tr>
<td>Engl 101 Composition</td>
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<td>Engl 402 Tech Writing</td>
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<tr>
<td>Bio S 103 and 104 or Bot 201</td>
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<tr>
<td>Math 107, 171, or 201, 202, or</td>
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<tr>
<td>Math 140, 141</td>
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<tr>
<td>Chem Principles</td>
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<td>A S 101 or 280 and 282</td>
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<td>A S 213, 301, or 313</td>
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<td>Spe 102 or Ag 205</td>
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<tr>
<td>Chem 240 Organic</td>
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<tr>
<td>Bot 320 Plant Phys</td>
<td>3</td>
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<tr>
<td>Bot 332 Systematic</td>
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<tr>
<td>Econ 203 or Ag Ec 201</td>
<td>3</td>
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<tr>
<td>Biom 310 or QMeth 215</td>
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<tr>
<td>Cpt S 150 and 151 or 153</td>
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<tr>
<td>Ag Ec 340 Intro Farm Ranch Plan</td>
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<tr>
<td>FRM 100 Intro For &amp; Rg Mgt</td>
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<td>FRM 300 Prof Development I</td>
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<td>FRM 302 Adv For &amp; Rg Envir</td>
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<td>FRM 304 Silviculture</td>
<td>2</td>
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<tr>
<td>FRM 351 Rg Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>FRM 352 Rg Livestock Mgt</td>
<td>3</td>
</tr>
<tr>
<td>FRM 354 Range Plant Comm</td>
<td>3</td>
</tr>
<tr>
<td>FRM 380 Wildlife Mgmt</td>
<td>3</td>
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<tr>
<td>FRM 399 Prof Integration</td>
<td>1</td>
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<tr>
<td>FRM 400 Prof Development II</td>
<td>1</td>
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<tr>
<td>FRM 451 Range Habitat Anal</td>
<td>1</td>
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<td>FRM 452 Range Development</td>
<td>3</td>
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<tr>
<td>FRM 456 Range and Ranch Planning</td>
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<td>Hum Electives</td>
<td>6</td>
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<tr>
<td>Soc S Elective</td>
<td>3</td>
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</tbody>
</table>

**OPTIONS IN RANGE MANAGEMENT**

By the beginning of the junior year (60 semester hours), students in range management are expected to have selected one of four options:

**Management.** Bot 436, FRM 460, Geol 102; electives approved by adviser.

**Science.** Bot 436; FRM 331, 348; GenCB 301; electives approved by adviser.
Wildlife Habitat Management. FRM 480, Zool 224; 12 credits of zoology and wildlife electives approved by adviser.

Directed Studies. 18-23 hours related course work approved by adviser and department chairperson of which three-fourths of the hours are to be 300- and 400-level courses.

Wildland Recreation Core Requirements
The wildland recreation curriculum leads to the Bachelor of Science degree in Forest Management. The curriculum does not meet the Society of American Foresters requirements for a professional forester. It can meet the U.S. Office of Personnel Management requirements for "Forester" if additional forestry courses are taken as electives.

The wildland recreation curriculum offers options in management, interpretation, and directed studies. It is designed for students desiring to work at the professional level for public agencies such as the National Park Service, U.S. Forest Service, Bureau of Land Management, Army Corps of Engineers, and Washington State Parks System. The curriculum is reviewed by professional recreation specialists and reflects skills and knowledge essential in entry level positions with resource-based recreation agencies.

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses. A minimum of 128 hours (exclusive of physical education activity courses) is required for graduation.

All wildland recreation students are required to take the following core courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>FRM 100 Intro For &amp; Rg Mgmt</td>
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<tr>
<td>FRM 300 Prof Development I</td>
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<tr>
<td>FRM 301 For &amp; Rg Envir</td>
<td>3</td>
</tr>
<tr>
<td>FRM 304 Silviculture</td>
<td>2</td>
</tr>
<tr>
<td>FRM 371 Wld Rec Policy</td>
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<tr>
<td>FRM 372 Wld Rec Field Lab</td>
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<td>FRM 373 Interp Tech</td>
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<td>FRM 399 Prof Integration</td>
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<tr>
<td>FRM 400 Prof Development II</td>
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<tr>
<td>FRM 471 Wld Rec Management</td>
<td>3</td>
</tr>
<tr>
<td>FRM 478 Wld Planning</td>
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<td>Chem Principles</td>
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<td>Geol 102 Phys Geol</td>
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<td>Bio S 103, 104 Intro Biol</td>
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<tr>
<td>Bot 332 Sys Bot</td>
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<tr>
<td>Soc 101 or Psych 101</td>
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<td>Pol 101 or 206</td>
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<td>Pol S 440</td>
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<td>Math 107 or 201</td>
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<tr>
<td>Biom 310 or Soc 321</td>
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Cpt S 150 and 151 or 153 | 4     |
Engl 101 Composition    | 3     |
Engl 402 Tech Writing   | 3     |
Spe 102 or Ag 205       | 3     |
Zool 330 Prin Conserv   | 3     |
Ag Ec 201 Econ in Agric | 3     |
Env S 444 Envir Impact Statement | 3 |
H Ed 363 First Aid      | 2     |

OPTIONS IN WILDLAND RECREATION
By the beginning of the junior year (60 semester hours) students are expected to have selected an option in the wildland recreation field. This option will add an additional 41-44 semester hours to the core curriculum. Options are available in the following areas:

Management. FRM 330, 331, or 348; FRM 302; FRM 380, 460, or 351; Soils 201; 6 hours Soc or Pol S electives (300-400-level); 9 hours approved electives; 6 hours humanities electives; 8-11 hours free electives.

Interpretation. Soc/Psych 350; FRM 330, 351, or 380; Zool 423, 428; 6 hours Soc or Psych electives (300-400-level); 3 hours anthropology electives; 3 hours speech electives; 3 hours approved electives; 6 hours humanities electives; 5-8 hours free electives.

Directed Studies. 41-44 hours of related course work approved by adviser and the department chairperson, of which three-fourths of the hours are to be 300- and 400-level courses.

Transfer Students
Transfer students should plan to complete the basic courses in English, speech, chemistry, biology, mathematics, social science, and humanities by the end of their sophomore year. Ten hours of unspecified Forestry credit is given for a technician's degree. Refer to WSU bulletin on Transfer Programs for Community Colleges, available through community college advisers, for details on transferable courses.

Graduate Programs
Students wishing to develop their skills beyond the four-year programs and having strong performance records in undergraduate work may elect to enroll in graduate programs. These programs lead to the degree of Master of Science in Forest and Range Management. Both thesis and non-thesis master's programs are offered.
General Agriculture


The primary functions of this program are the listing of courses that are of general interest to students in agriculture and related fields and the administration of the undergraduate major in general agriculture (including agricultural communications and integrated pest management) and the graduate major in Adult and Continuing Education.

The undergraduate major in general agriculture is designed for students who wish to prepare for certain careers requiring broad training in agriculture. A maximum number of electives is permitted to enable the student to specialize in one or two fields, or otherwise to tailor the curriculum to fit particular needs. Majors in agricultural communications and integrated pest management are also available in general agriculture.

The Master of Adult and Continuing Education degree is designed for professionals in the field of adult and continuing education. Requirements and course descriptions are outlined in the Graduate Study Bulletin.

The courses of study lead to the degrees of Bachelor of Science in Agriculture and Master of Adult and Continuing Education.

Description of Courses

For explanation see Index under "Symbols"

Agriculture

Ag

205 [C] Human Relations in the Business of Agriculture 3 (2-3) Developing an understanding of human behavior and learning skills in communication and leadership.

499 Special Problems V 1-4 May be repeated for credit.

Biometrics

Biom

310 Agricultural Statistics 3 (2-3) Prereq Math 101. Methods of statistical analysis and the principles involved in their interpretation and application to agricultural data.

412 Biometry 3 Prereq Math 101. Principles and methods of statistical analysis as applied to biological experimentation.

Statistical Methods in Engineering 4 Prereq Math 172, 220. Random variables, sampling, hypothesis testing; linear, multilinear, and nonlinear regression; analysis of variance for designed experiments; statistical computing. Credit not normally granted for both Biom 430 and Stat 443.

Analysis of Variance and Experimental Design 3 Prereq Biom 412 or Stat 360. Principles of design with analysis and interpretation of data.

530 (520) Applied Linear Models 3 Prereq Biom 450 or 412. The design and analysis of experiments by linear models. (a/y)

600 Special Projects or Independent Study Variable credit.

Integrated Pest Management

IPM

201 (Ag 201) Introduction to Pest Management in a Quality Environment 2 Pest management to maximize plant protection and safeguard the quality of the environment.

399 Pest Management Internship V 1-4 May be repeated for credit; cumulative maximum 7 hours. By interview only. Supervised individual practicum with IPM-oriented businesses, organizations, and government agencies; professional related field interaction.

452 (Entom 452) Pesticides and the Environment 2 Prereq 12 hrs Bio S. Immediate and prolonged effects of pesticides on man and other animals; legal and moral repercussions of pesticide use.

462 Systems of Integrated Pest Management 3 (2-3) Prereq Bio S 372; IPM 201. Utilization of the systems approach in agricultural pest management; design, implementation, and analysis of IPM programs for selected crops. (a/y)

GENERAL AGRICULTURE

Schedule of Studies

At least 40 of the total hours required for this degree must be in upper-division courses with at least 24 hours in agriculture. Students electing a major in general agriculture must complete at least 9 semester hours in English composition, speech, communications, and Ag
have 12 hours of soils. To qualify as soil scientists, a total of 15 hours in soils is required. Soils 201, 301, 400, 404, and 411 are recommended.

More emphasis in business can be gained by taking Ag Ec 335, 340, 350, and 351; Accr 230; Econ 320; Cpt S 200, 201, or 220.

AGRICULTURAL COMMUNICATIONS

A major in agricultural communications is offered in the College of Agriculture, in cooperation with the Department of Communications, leading to the degree of Bachelor of Science in Agriculture.

The student declaring this major must complete the requirements of the general agriculture curriculum and earn a minimum of 30 hours in the Department of Communications, including any communications courses used to satisfy general agriculture requirements. Those electing this major should make that decision known as early as possible in their academic career.

Agricultural Communications majors should complete the following:

Print Media: Jour 225, 235; Cine 253; Pr 313, 413; Com 490, and 9 elective hours in the Department of Communications.

Broadcast Media: Bcast 165, 250, 255, 355, 365; Pr 312, 413; Com 490, and 6 elective hours in the Department of Communications.

Recommended electives: The student should consult with a Department of Communications adviser before registering for elective courses. Specialized programs patterned for individual career aspirations may be developed in conjunction with the head of the Department of Communications or a designated representative.

INTEGRATED PEST MANAGEMENT

The integrated pest management major offered by the College of Agriculture is a multidisciplinary course of study sponsored by the Departments of Agronomy and Soils, Entomology, Horticulture and Landscape Architecture, and Plant Pathology and coordinated through the General Agriculture Program. Students acquire a holistic perspective and ecological understanding of the philosophy, principles, and practices of pest management and are trained to become professional crop protection specialists. Students in this major have the option of obtaining a general background in pest management or specializing in one or more of the areas of entomology, plant pathology, and weed science within pest management. All students
also participate in a summer internship program whereby they have the opportunity to gain work experience through supervised off-campus employment with pest management individuals or organizations.

This major is recommended for individuals seeking a career with federal and state environmental and regulatory agencies or as agricultural company field or sales representatives, pest control applicators, consultants or operators and agribusiness managers. Interested persons should contact the curriculum coordinator and adviser in the Department of Entomology.

**Schedule of Studies**

All students are required to complete a minimum of 120 semester hours of course work, including the internship, to earn the Bachelor of Science in Agriculture degree. At least 40 of the total hours required must be in upper-division courses.

**Freshman Year**

**First Semester**

<table>
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<th>Hours</th>
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<tr>
<td>Chem 101 or 105</td>
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<tr>
<td>Engl 101 Composition</td>
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<tr>
<td>IPM 201 Intro Pest Mgmt</td>
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<td>Hum Elective</td>
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**Second Semester**

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<td>Chem 102 or 106</td>
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<tr>
<td>Math 107 or 140</td>
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<td>Psych 101 Introduction</td>
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**Sophomore Year**

**First Semester**

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<td>Ag 205 Human Rel</td>
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</tr>
<tr>
<td>Ag Ec 201 Econ Agric</td>
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<td>Agron 201 or Hort 201</td>
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<tr>
<td>Ch E 174 Intro Meteor</td>
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<td>Env S 101 Env Hum Life</td>
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**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Bact 201 Gen Microb</td>
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<tr>
<td>Chem 240 Elem Org Chem</td>
<td>4</td>
</tr>
<tr>
<td>Soils 201</td>
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<td>Hum Elective</td>
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**Junior Year**

**First Semester**

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<th>Course</th>
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<tbody>
<tr>
<td>Agron 305 Weeds</td>
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<tr>
<td>Biom 310 Agric Stat</td>
<td>3</td>
</tr>
<tr>
<td>Bot 320 Intro Plant Phys</td>
<td>3</td>
</tr>
<tr>
<td>Pl P 329 Gen Plant Path</td>
<td>3</td>
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<td>Elective/Option Course</td>
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**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>Bio S 372 Gen Ecol</td>
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</tr>
<tr>
<td>Bot 332 Intro Sys Bot</td>
<td>4</td>
</tr>
<tr>
<td>Entom 340 Agric Entom</td>
<td>3</td>
</tr>
<tr>
<td>IPM 452 Pesticides Env</td>
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<td>Elective/Option Course</td>
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**Summer Session**

<table>
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<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>IPM 399 Pest Mgt Intern</td>
<td>3</td>
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**Senior Year**

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Electives/Option Courses</td>
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**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tr>
<td>Hort 417 Plt Pest Contr</td>
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<tr>
<td>IPM 462 Sys Pest Mgmt</td>
<td>3</td>
</tr>
<tr>
<td>Electives/Option Courses</td>
<td>9</td>
</tr>
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</table>

**Entomology Option.** Students must take the above listed courses plus the following: Entom 343 instead of 340, 441, plus either 348, 443, 448 or 450.

**Plant Pathology Option.** Students must take the above courses plus the following: Bact 414, Pl P 503.

**Weed Science Option.** Students must take the above courses plus the following: Agron 301, 302, 303, 345.

**Foreign Service**

Many students wish to serve in a foreign country. Some desire temporary or interim assignments. Others desire lifetime careers in serving as agriculturists in foreign lands. Excellent preparation is possible through the general agriculture curriculum. Twenty semester hours of courses chosen from the following list will, along with the General Agriculture curriculum, help prepare the student for foreign service in agriculture:

- Ag Ec 420; Anth 101, 203, 301; Bact 101; Econ 416, 470, 472; Env S 101; HNF 130; GenCB 201; Geo 101; Pol S 102, 222, 423, 427; Psych 101, 102, 350; Soc 101, 270, 330, 371; For L elective.

**General Studies**

General Studies is for students who have varied interests that may cut across the usual departmental boundaries, and who wish to play a major role in deciding on a suitable curriculum of study. The student earns a Bachelor of
Arts in Humanities, Bachelor of Arts in Social Sciences, Bachelor of Science, or Bachelor of Liberal Arts degree depending upon the program selected. The degree is not identified with a special subject matter field on the diploma.

Total credits for graduation of 120 semester hours should normally include 40 credits or more in courses at the 300- and 400-level.

Students who wish to enroll in General Studies should contact the appropriate coordinator or adviser listed below under the various divisions.

Biological, Mathematical, and Physical Sciences

H. Batey, Coordinator

This division of General Studies is for students who are interested in interdisciplinary programs which offer broader options in course selections than are possible within single departments. The only restrictions are that each major program be coherent and that upper-division courses be represented to the greatest degree consistent with appropriate prerequisites.

Each student will (1) satisfy the General University Requirements and any additional requirements of the College of Sciences and Arts; (2) earn 120 semester hours, that normally include 40 or more at the upper-division level; (3) devise a program of study under a defined goal of some future career or of postgraduate study.

Plan A. A major concentration of courses not less than 24 credits in a single department, program or area including at least 15 upper-division hours, and a minor concentration not less than 15 credits in another department, program or area including at least 6 upper-division hours.

Plan B. A combination of biological sciences courses not less than 39 credits in three or more departments or programs including at least 21 upper-division hours.

Plan C. A combination of mathematical and physical sciences courses not less than 39 credits in three or more departments or programs including at least 21 upper-division hours.

Classical Studies

R. S. Williams, Coordinator

The classical studies option is designed for students who wish to obtain a broad understanding of the ancient Greek and Roman foundations of modern Western Civilization. Greek and Latin language study is an important part of the program in order to aid comprehension of classical thought, literature, and history. This major should be of great value for students contemplating careers in medicine, law, and business or graduate work in history, archaeology, or literature. It is not suitable for those who wish to teach Latin or Greek or enter graduate school in classics unless additional language study is undertaken. The approach is interdisciplinary and flexible to allow students to pursue varied interests within a broad field. This major leads to the degree of Bachelor of Liberal Arts.

Degree Requirements

Major: General Studies—Classical Studies

Each student must (1) satisfy the General University Requirements and any additional requirements of the College of Sciences and Arts, (2) earn 120 semester hours which normally include 40 or more at the upper-division level, (3) complete a second year (or its equivalent) of Greek or Latin language, (4) a minimum of 36 hours of courses in classical studies including:

<table>
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<tr>
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<tbody>
<tr>
<td>F A 201</td>
<td>Art of Western Civ</td>
<td>3</td>
</tr>
<tr>
<td>Hist 340</td>
<td>Ancient Greece</td>
<td>3</td>
</tr>
<tr>
<td>Hist 341</td>
<td>Rome: Rep &amp; Emp</td>
<td>3</td>
</tr>
<tr>
<td>Hum 100</td>
<td>Mythology</td>
<td>2</td>
</tr>
<tr>
<td>Hum 101</td>
<td>Hum Anc World</td>
<td>3</td>
</tr>
<tr>
<td>Hum 301</td>
<td>Greek &amp; Rom Drama</td>
<td>2</td>
</tr>
<tr>
<td>Phil 300</td>
<td>Anc &amp; Med Phil</td>
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(5) 17 hours from

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Anth 336</td>
<td>Classical Archaeology</td>
<td>3</td>
</tr>
<tr>
<td>Engl 308</td>
<td>Intr Lit Crit</td>
<td>3</td>
</tr>
<tr>
<td>F A 202</td>
<td>Art Western Civ</td>
<td>3</td>
</tr>
<tr>
<td>F A 301</td>
<td>Classical Heritage</td>
<td>3</td>
</tr>
<tr>
<td>Hist 381</td>
<td>Sci West Civ</td>
<td>3</td>
</tr>
<tr>
<td>Pol S 437/Hist 488</td>
<td>Class Pol Thot</td>
<td>3</td>
</tr>
<tr>
<td>Hist 440</td>
<td>Early Middle Ages</td>
<td>3</td>
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</table>

Additional Greek and Latin beyond the basic language requirements, appropriate seminars, special offerings, and independent study from associated departments with the approval of the Coordinator of the classical studies option.

Minor: Students wishing to minor in Classical Studies are required to take a minimum of 16 hours of course work chosen from the above list, at least 8 of which are at the 300-level and above. Students are encouraged, but not required to take a classical language.
Humanities and Social Sciences

H. Deming, Director

This division of General Studies is for students whose primary interest in the humanities or social sciences requires interdisciplinary programs and course selections which are not possible within single academic programs or established curricula. It is expected that the student’s major program will be coherent, that it will include as many upper-division hours as possible consistent with appropriate prerequisites, and that it will be aimed at a general education or oriented toward a future career.

Each student must (1) satisfy the General University Requirements and any additional requirements of the College of Sciences and Arts, (2) earn 120 semester hours which normally include 40 or more at the upper-division level, (3) establish an acceptable program in consultation with the coordinator from one of the plans set forth below, and (4) achieve at least a 2.00 g.p.a. in program course work.

Plan A. A concentration of courses at least 24 credits in a single academic department or special curriculum, and a minor concentration at least 15 credits in another department or special curriculum.

Plan B. A combination of humanities courses at least 39 credits involving three or more academic departments.

Plan C. A combination of social science courses at least 39 credits involving three or more academic departments.

Liberal Arts

R. Littlewood, Coordinator

Students who choose this option design their own major with the help of the adviser. The major is conceived of as the pursuit of a coherent body of knowledge beyond the usual departmental boundaries. In this process, the student is expected to become literate and skillful in the use of the English language, attain competence in a foreign language, and demonstrate a capacity for rational evaluation and discourse. The Liberal Arts Program may also lead to certification in Secondary Education in appropriate cases.

Normally in this program students will also: (1) satisfy General University Requirements; (2) write, during their senior year, a thesis on a topic arising out of their particular course of studies; (3) carry on a significant portion of their studies guided by independent reading; and (4) earn at least half the credit hours after joining the program in upper-division and perhaps some graduate courses.

Linguistics

L. Gordon, Coordinator

A student majoring in linguistics may expect a broad liberal education in literature, anthropology, mathematics, and philosophy, around a core of language. The student will gain a substantial familiarity with several languages and types of linguistic structure, and will become conversant with the formal theories of linguistic analysis and the historical study of language.

The major in linguistics requires 40 credit hours, variously distributed among the following courses, depending upon the particular emphasis which the student and adviser together select. Each of the following general areas must be represented in the program:

Linguistics: Anth 250, 350, 355, 450, 456, 499; Engl 256, 354, 458, 499; 21 or more hours including at least one historical course.

Mathematics, Computer Science and Statistics: Math 107, 171, 172, 201, 202; Stat 360; Cpt S 150, 260, 405; 3 to 12 hours depending upon special emphasis.

Philosophy: Phil 201, 320, 401, 410; 3 to 12 hours depending upon emphasis.

Foreign Language: Six to 18 hours, depending on special emphasis; the 6 hour minimum, if elected, must be at the 300-level or higher.

Religious Studies

D. H. Bishop, Coordinator

Students majoring in Religious Studies will gain a broad background and understanding in the religious values and spiritual concepts of their own and other cultural traditions, and in the mutual relations between religious and other social institutions. Students considering careers in charitable or church callings will find special interest in this major, but it is appropriate for anyone.

A student may earn a major in Religious Studies by completing 39 semester hours of work from among the designated courses in the several departments involved. Of these 39 hours, 23 must consist of specified core courses, details of which can be obtained from the Coordinator. The remaining 16 hours for the
major can come from among any of the courses on the approved list.

A student must also satisfy the GUR and College of Sciences and Arts graduation requirements, and take at least 40 of the total 120 semester hours in upper-division courses. For a Minor in Religious Studies, a student must take at least 16 semester hours of work from among the courses on the approved list, at least half of which must be at the upper-division level. Religious Studies also makes an ideal second major, which can be acquired with no extra course work of any kind.

The approved courses for the major or minor in Religious Studies are as follows:

Anth 303; Engl 304, 305, 306, 307, 335, 407, and 416; Classics 350; For L 300 (ancient languages only), For L 310, For L 352, Lat 101 and 102; Hist 101, 270, 301, 341, 374, 423, 440, 441, and 445; Hum 100, 101, 202; Phil 107, 300, 314, 315, 407 and 440; and Soc 341.

Independent Studies (499) may also receive some credit in participating departments toward Religious Studies major or minor.

Teacher-Training

Students who are preparing to teach in junior or senior high school may in some cases receive their degrees in General Studies. Such students must fulfill the requirements for graduation of the College of Sciences and Arts. There are no further requirements if they complete their teaching major and minor and fulfill all the requirements for the Provisional Certificate. The degree awarded is Bachelor of Arts in Humanities, Bachelor of Arts in Social Sciences, or Bachelor of Science according to the degree granted in the student’s major teaching field.

In the case of the following teaching majors, the degree must be taken in General Studies: the junior high school major—language arts; the junior and senior high school majors—physical science.

In a number of junior and senior high school teaching majors the student has the choice of getting a degree in General Studies or completing additional work for a degree in the department concerned.

For further information on teaching certification, refer to the Department of Education.

Program in Genetics and Cell Biology

Professor and Program Head, W. A. Becker; Professors, A. Klein, W. J. Kazuk, R. A. Nilan; Associate Professors, P. J. Larrin, M. L. Pahl, R. Reeves, A. L. Schrader; Assistant Professors, M. L. Kahn, M. E. Moody, G. H. Thorgaard.

The Program in Genetics and Cell Biology offers graduate study and research programs leading to the degrees of Master of Science and Doctor of Philosophy (Genetics and Cell Biology). Areas of specialization include, but are not limited to, genetic engineering, cell biology, biochemical and developmental genetics, mutagenesis, cytogenetics, population and quantitative genetics, and wheat, barley, and poultry breeding. The program consists of core faculty members who hold joint appointments in Genetics and Cell Biology and cooperating departments, and associate members who have courtesy appointments in the program which allow them to act as advisers for graduate students majoring in Genetics and Cell Biology. Cooperating departments include Agronomy and Soils, Animal Sciences, Bacteriology and Public Health, Biochemistry and Biophysics, Institute of Biological Chemistry, Plant Pathology, Pure and Applied Mathematics, Veterinary and Comparative Anatomy, Pharmacology, and Physiology, Veterinary Microbiology and Pathology, and Zoology. The program also cooperates with geneticists and cell biologists at the University of Idaho, Moscow, Idaho.

Faculty are actively involved in the following research: DNA replication of plasmids and bacteriophages, mutagenesis, plant molecular genetics, genetic engineering of plants, breeding and genetics of wheat and barley, breeding and genetics of dry edible legumes, biochemistry and genetics of DNA repair, biochemistry of chromatin structure and function, cellular regulatory mechanisms, positional control in cellular development, gene expression in animals, gene function associated with plant-fungal interactions, molecular genetics of viruses, chemical carcinogenesis and neoplastic progression, and quantitative genetics of avian body composition.

One rapidly growing area at Washington State University is genetic engineering of eukaryotes. Several faculty are working together on the basic biology of gene transfer.
with the intention of improving domesticated plants.

The interdisciplinary role of genetics and cell biology is emphasized, thus permitting students to study with scientists who represent a wide range of research interests in plant, animal, and microbial genetics. Many of the faculty research interests have a major cellular orientation and consequently training in cell biology as well as more strictly genetic areas is available within the program.

The Program in Genetics and Cell Biology, being an interdepartmental organization, enjoys the availability of many and highly diverse facilities for research. Faculty laboratories are well equipped with modern equipment, especially in the area of DNA recombination, molecular genetics, and cell biology.

Biochemistry, cytology, mathematics and statistics, and physiology are the principal avenues through which knowledge of genetics and cell biology is acquired. These subjects are necessary supplemental areas of study for students in the program.

Students who receive Master's and Ph.D. degrees obtain positions in basic and applied genetics at universities, federal departments and laboratories, private industry, including plant and animal breeding, and, in some cases in specialized medical research.

**Description of Courses**

For explanation see Index under "Symbols"

GenCB


301 General Genetics 3 Prereq Bio S 104; 2 sem Chem. Principles of modern and classical genetics.

402 (302) General Genetics Laboratory 2 (0-6) Prereq GenCB 301 or c/f. Basic principles of modern and classical genetics utilizing several species.

430 (330) Human Genetics 3 Prereq GenCB 301 or 201. Exploration of individual and population genetics leading to critical discussion of current social, medical, and scientific issues.

450 Cell Biology 3 Prereq BC/BP 364; GenCB 301. Cellular structure and function.

485 Molecular Biology of the Gene V 2-4 Prereq elementary course in genetics. Molecular basis of genetics: DNA, RNA, protein biosynthesis, and genetic engineering. Cooperative course taught at the University of Idaho. (a/y)

490 Instructional Practicum V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq GenCB 301. By interview only.

499 Special Problems V 1-4 May be repeated for credit.

502 Microbial and Molecular Genetics 2 Prereq GenCB 301. Microbial and cell culture genetics and eukaryotic molecular genetics.


513 Forest Genetics 3 (2-3) Prereq GenCB 301; course in silviculture. Application of principles of genetics to the improvement of trees and silvicultural practices. Cooperative course taught at the University of Idaho. (a/y)

514 Forest Tree Improvement 3 Prereq GenCB 301; course in silviculture. Practical problems and techniques related to genetic improvement of forest trees. Field trips required. Cooperative course taught at the University of Idaho. (a/y)

535 Physiology and Genetics of Parasitism 3 Same as PI P 535. (a/y)

540 Cytogenetics 3 Prereq GenCB 301. Chromosome structure, behavior, and evolution; effects of changes in chromosome number and structure. Joint listing with the University of Idaho. (a/y)

542 Induced Mutation 3 Prereq GenCB 301. Principles and methods related to the induction, selection, and use of mutations. (a/y)

560 Molecular Genetics 3 Prereq GenCB 301, Bact 201, or GenCB 502; BC/BP 364. Biochemical description of genetic processes in microorganisms.

562 Mathematical Genetics 3 Same as Stat 562. (a/y)

566 Biochemical Techniques 3 (1-6) Same as BC/BP 566.

569 Nucleic Acid Biochemistry 3 Same as BC/BP 569. (a/y)

570 Plant Molecular Genetics 3 Prereq GenCB 502. Plant molecular genetics with emphasis on systems specific to
plants and plant genetic engineering. (a/y)

573 Cellular and Molecular Aspects of Development 3 Same as Zool 573. (a/y)

581 Advanced Topics in Genetics V 1-2
May be repeated for credit. Prereq GenCB 511 or 502. Recent research in
selected areas of genetics.

592 Advanced Topics in Cell Biology V 1-3
May be repeated for credit; cumulative
maximum 7 hours. Current research in
cell structure and function.

598 Seminar 1 May be repeated for credit.
Prereq GenCB 301. Reviews of recent
and classical research in genetics and
cytology.

600 Special Projects or Independent Study
Variable credit.

700 Master’s Research, Thesis, and/or Exami-
nation Variable credit.

702 Master’s Special Problems, Directed
Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or
Examination Variable credit.

Geological Engineering

Osburn, G. D. Webster; Associate Professors,
D. T. Higgins, D. L. Johnston, B. O. Olson,
A. J. Watkinson; Assistant Professor, J. D.
Higgins.

Geological engineering is an interdisciplinary
curriculum of the Department of Geology and
the Department of Civil and Environmental
Engineering.

The undergraduate program is designed to
develop in the student a solid foundation in
the principles of geology and engineering so
that the graduate can integrate in-depth
knowledge of geologic conditions into the de-
sign of engineering structures. Although the
undergraduate curriculum is fairly rigid to
meet the ABET accreditation standards, some
flexibility is available through choice of elec-
tives, and students may direct their interests
into either geotechnics or hydrology.

Because of the ever increasing knowledge
required to practice at high levels of com-
petence in the diverse areas of geological en-
gineering, it is recommended that the student
pursue studies through the MS degree.

The courses of study lead to the degrees of
Bachelor of Science in Geological Engineering
and Master of Science in Geological Engineer-
ing. Advanced graduate students wishing to
specialize in geological engineering may work
towards a Ph.D. in geology or engineering
science.

Description of Courses

Descriptions of all courses in the following
schedule of studies are given under the in-
dividual listings according to the department
prefix.

Schedule of Studies

A Bachelor of Science degree in Geological
Engineering ordinarily requires a total of 128
hours. At least 50 of the total hours required
for this degree must be in upper-division
courses.

Freshman Year

First Semester
Math 171 Calculus I
Chem 105 Principles
Geol 102 Physical
M E 101 Graphic Design
Hum Elective

Second Semester
Math 172 Calculus II
Chem 106 Principles
M E 102 Descriptive Geometry
Engl 101 Composition
Geol 350 Mineralogy and Crystal

Sophomore Year

First Semester
Math 220 Intro Linear Algebra
Phys 201 Classical
C E 211 Statics
Communications Prof Elective
C E 101 Intro to Surveying

Second Semester
Phys 202 Classical
C E 212 Dynamics
C E 314 Mechanics of Materials
Hum Elective
Soc Elective

Junior Year

First Semester
Math 315 Differential Equations
C E 317 Geotechnical Engr I
Geol 340 Structures
Geol 306 Rocks of the NW
C E 318 Lab
Star 360 Statistics
sequences, and the need for engineering physics and good preparation in mathematics.

Department of Geology

Professor and Department Head, G. D. Webster; Professors, J. W. Crosby, III, P. R. Hooper, P. E. Rosenberg, R. K. Sorens; Professor Emeritus, J. W. Mills; Associate Professors, F. F. Poit Jr., H. L. Vacher, A. J. Watkinson; Assistant Professors, S. Y. Johnson, L. D. Meinert, R. L. Thiessen; Adjunct Associate Professor, Y. Herman-Rosenberg.

Geology is the study of the Earth’s materials, structure, and history. The department offers both general and specialized training in the major branches of the science. The elementary courses are designed to provide a strong background for those who major in geology as well as to furnish other students with an interesting and comprehensive introduction to earth science. The program provides excellence in training and research on the nature, origin, evaluation, use, and conservation of our water and non-renewable energy and mineral resources. Students who intend to go into professional geological work should plan on earning an advanced degree.

The department occupies a large modern building with extensive modern research and teaching laboratories. The courses of study lead to the degrees of Bachelor of Science in Geology, Master of Science in Geology, and Doctor of Philosophy. A minor in geology is also offered.

The department also participates in the interdepartmental program leading to the degree of Bachelor of Science in Geological Engineering and Master of Science in Geological Engineering.

Description of Courses

For explanation see Index under "Symbols"

Geol
101 [P] Introduction to Geology 4 (3-3) Not open to students with credit in Geol 102. Introductory physical geology for non-science majors; emphasis on western U.S.
102 [P] Physical Geology 4 (3-3) Not open to students with credit in Geol 101. For science majors and honors stu-
dents. Modern concepts of earth science; mineral rock, resource, and map study. Field trip required.

306 Introductory Petrology 2 (1-3) Field and laboratory rock and mineral study; hand specimen identification of rocks. Field trip required.

307 Field Methods 3 (1-6) Prereq Math 107; Geol 340. Principles and application of instruments and methods used in geologic mapping. Field trip required.

308 Field Geology 5 Prereq Geol 307. Admission by arrangement. Detailed geologic mapping of an area; practice in methods of geologic field work.

310 [P] Evolution and Earth History 4 (3-3) Prereq Geol 101 or 102. History and development of the Earth's physical features and its inhabitants. Field trip required.

317 Geotechnical Engineering I 2 Same as C E 317.

318 Geotechnical Engineering Laboratory I 1 (0-3) Same as C E 318.

320 Spring Field Trip Preparation 1 May be repeated for credit. Prereq Geol 310. Reading in preparation for geology spring field trip.

321 Spring Field Trip 1 (0-3) May be repeated for credit. Prereq Geol 310. A week field trip to study lateral changes in sedimentary rocks of a selected area of the western United States.

322 [P] Physical Oceanography 2 Physical properties of the oceans, ocean floors, and ocean margins; their origin, development, and significance to man.

340 Geologic Structures 4 (3-3) Prereq Geol 101 or 102. Field trip required.

350 (250) [P] Mineralogy and Crystallography 4 (2-6) Prereq Geol 101 or 102; Chem 101 or 105. Composition, physical properties, structure, crystallography, identification, and origin of minerals. Field trip required.

355 Optical Mineralogy 3 (2-3) Prereq Geol 350, Phys 102 or 202. Elements of optical crystallography and optical identification of minerals.

363 Pacific Volcanoes 2 Geologic development and eruption history of volcanoes of the Pacific Coast.

402 Earth's Resources 3 Prereq Geol 101 or 102 or Env S 101. The origin, occurrence, production, reserves, and future of the Earth's finite energy and mineral resources and its water supply. (a/y)

403 Environmental Geology 3 Prereq Geol 101 or 102; Env S 101. Geologic hazards and geologic problems associated with human activities. Field trip required.

410 Invertebrate Paleontology 4 (3-3) Prereq Geol 310. Morphology, classification, evolution, and ecology of fossil invertebrate organisms.

415 Environmental Measurements 3 (1-6) Same as C E 415.

420 Sedimentary Petrography and Sedimentation 3 (2-3) Prereq Geol 310. Sedimentary rock composition and origins applying the fundamental principles of sedimentation.

421 Principles of Stratigraphy 2 (1-3) Prereq Geol 310. Principles of correlating and dating of sedimentary strata.

426 Engineering Geology and Geotechnics 3 Same as C E 426. Credit not granted for both Geol 426 and 526.

430 Quantitative Geomorphology 3 Prereq Geol 310. Modern quantitative techniques for analyzing the processes of landscape formation.

440 Rock Mechanics 3 (2-3) Prereq Geol 340; C E 317, 318. Mechanical behavior and properties of rocks using data from laboratory experiments and field observations.

461 (361) Igneous Petrology 2 (1-3) Prereq Geol 355. Mineralogy and petrology of igneous rocks, using the polarizing microscope. Field trip required.

462 (362) Metamorphic Petrology 2 (1-3) Prereq Geol 461 or C F. Mineralogy and petrology of metamorphic rocks, using the polarizing microscope. Field trip required.


475 Ground-Water Hydrology 3 Prereq Geol 340 or C E 351. Fundamentals of ground water accumulation, storage, and flow; exploration and development.

480 Introductory Geochemistry 3 Prereq Chem 106; Geol 102 or 310. The chemistry of earth materials and processes.

486 Principles of Geochemistry 3 Prereq Chem 106; Geol 362. Chemical concepts applied to geology. Cooperative course taught by the University of Idaho.
498 Undergraduate Seminar 1 May be repeated for credit; cumulative maximum 3 hours. Prereq major in Geol or related field. Research papers presented by students, faculty, and visiting scientists on geological research.

499 Special Problems V 1-4 May be repeated for credit.

500 Instructional Practicum 1 Prereq graduate student in Geol. By interview only. Instruction and practice of laboratory teaching in geology.

508 Advanced Field Methods 3 (0-9) May be repeated for credit. Individual instruction in advanced methods of field geology.

511 (510) Stratigraphic Paleontology 4 (2-6) Prereq Geol 410. (a/y)

515 Paleoecology 3 Past environments; interrelations of physical and biological factors; changes in the physical environments. Cooperative course taught at the University of Idaho. (a/y)

516 Methods in Paleontology and Biostratigraphy 3 Prereq Geol 410. Methods of collection, preparation, illustration of paleontologic data; principles of systematic paleontology; statistical-graphic data presentation. Field trip required. Cooperative course taught at the University of Idaho. (a/y)

520 Regional Stratigraphic Analysis 4 (1-9) Prereq Geol 421. (a/y)

523 Advanced Topics in Stratigraphy 3 May be repeated for credit. Prereq Geol 421. (a/y)

524 Geophysical Engineering 4 (3-3) Same as CE 524.

525 Sedimentology 3 (2-3) Prereq Geol 420. Advanced problems and techniques in sedimentation. (a/y)

526 Engineering Geology and Geotechnics 3 Same as CE 526. Graduate level counterpart of Geol 426; additional requirements. Credit not granted for both Geol 426 and 526.

527 Sedimentary Petrology of Clastic Rocks 3 (2-3) Prereq Geol 420. Hand sample and thin section petrography and petrology of terrigenous sedimentary rocks. Cooperative course taught at the University of Idaho.

528 Sedimentary Petrology of Carbonate Rocks 3 (2-3) Prereq Geol 420. Hand sample and thin section petrography and petrology of limestones and dolomites. Cooperative course taught at the University of Idaho.

529 Geologic Development of North America 3 Prereq Geol 410, 421. Sedimentation, tectonics, stratigraphy of North America; Cordilleran geology. Field trip required. Cooperative course taught at the University of Idaho.


541 Structural Analysis 3 (2-3) Prereq Geol 340. Structural analysis of complexly deformed rocks in orogenic belts.

550 Advanced Mineralogy 3 Prereq Geol 355; Chem 106. Elements of crystal chemistry and crystal physics. (a/y)

551 Ore Microscopy 3 (0-9) Prereq Geol 355, 470. Identification of ore minerals using polarizing ore microscope; interpretation of ore textures; reflectance and rotation measurements; photomicrography; practical problems.

552 X-ray Analysis in Geology 3 (2-3) Prereq Geol 350, 355. Generation and use of X-rays in geological research; powder diffraction and X.R.F. spectrometry; practical problems.

560 Advanced Igneous Petrology 3 (2-3) Prereq Geol 361. Petrogenesis of igneous rocks.

561 Advanced Mineral Deposits 3 Ore mineralogy and sulphide phase equilibria; microscopic studies of natural and synthetic sulphide minerals. Cooperative course taught at the University of Idaho. (a/y)

565 Metamorphism 3 (2-3) Prereq Geol 362. Metamorphic minerals, rocks, processes, and facies. Cooperative course taught at the University of Idaho.

571 (570) Metallic Mineral Deposits 3 Prereq Geol 470. Modern advances in the genesis of metallic mineral deposits of magmatic, hydrothermal sedimentary, and metamorphic origin. Field trip required.

573 Advanced Topics in Economic Geology 2 (1-3) May be repeated for credit. Prereq Geol 470. Combined field, laboratory, and library research on some problem in nonmetallic or metallic mineral deposit genesis. Field trip required. (a/y)

577 Advanced Groundwater Hydrology 3 Prereq Geol/C E 475. Groundwater flow systems; modeling and resource management.

581 Mineral Equilibria 3 Prereq Geol 362. Principles and petrologic significance
of phase equilibria in mineral systems.

585 Geochemical Exploration 3 (2-3) Principles and use of rapid chemical tests of rocks, soil, sediment, vegetation, or water samples in prospecting for mineral deposits. Cooperative course taught at the University of Idaho.

586 Advanced Geochemical Exploration 3 (2-3) Colorimetric and instrumental analytical methods in mineral exploration, primary and secondary dispersion patterns, endogenetic and exogenetic behavior of individual elements. Cooperative course taught at the University of Idaho. (a/y)

590 Photogeology 3 (1-6) Air photos for geologic information; elements of photogrammetry; map preparation and interpretation of stereo vertical and oblique air photos. Cooperative course taught at the University of Idaho.

592 Interdisciplinary Research Topics in Geology 3 May be repeated for credit; cumulative maximum 6 hours. Advanced topics across normal subject boundaries; tectonics and magma origin.

593 Advanced Topics in Petrology 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Geol 550, 551, 560. Ore petrology or igneous petrology. (a/y)

594 Advanced Methods in Mineralogy and Geochemistry 4 (3-3) Application of advanced instrumental methods to geologic problems. (a/y)

598 Graduate Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Prereq graduate student in Geol or related field. Papers presented by students, faculty, and visiting scientists on geological research.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

I. General University and Arts and Sciences Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
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<tbody>
<tr>
<td>Engl 101, English Comp*</td>
<td>3</td>
</tr>
<tr>
<td>Communication Proficiency</td>
<td>3</td>
</tr>
<tr>
<td>Humanities</td>
<td>6</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>6</td>
</tr>
<tr>
<td>Humanities or Social Sciences</td>
<td>9</td>
</tr>
</tbody>
</table>

Foreign Language 1 year (2 semesters) unless 2 years have been taken in high school.

*If grade is not B or above, Engl 201 must be taken.

II. Geology Requirements

Students are encouraged to discuss with their geology adviser modifications which may be made in the list of required courses to fit the needs of specialized interests.

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Geol 102 Physical</td>
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</tr>
<tr>
<td>Geol 307 Field Methods</td>
<td>3</td>
</tr>
<tr>
<td>Geol 308 Field Geol</td>
<td>5</td>
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<tr>
<td>Geol 310 Evolution</td>
<td>4</td>
</tr>
<tr>
<td>Geol 340 Geol Structures</td>
<td>4</td>
</tr>
<tr>
<td>Geol 350 Mineral and Crystallog</td>
<td>4</td>
</tr>
<tr>
<td>Geol 355 Optical Mineralogy</td>
<td>3</td>
</tr>
<tr>
<td>Geol 361 Ig Petrology</td>
<td>2</td>
</tr>
<tr>
<td>Geol 362 Met Petrology</td>
<td>2</td>
</tr>
<tr>
<td>Geol 410 Paleontology</td>
<td>4</td>
</tr>
<tr>
<td>Geol 420 Sed Petrography</td>
<td>3</td>
</tr>
</tbody>
</table>

Three courses from: Geol 403, 421, 430, 440, 470, 475, 480

8-10

III. Specific Outside Requirements

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
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<tr>
<td>Chem 105-106 Principles</td>
<td>8</td>
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<tr>
<td>Bio S Elective</td>
<td>3</td>
</tr>
<tr>
<td>Phys 201-202 Classical Physics*</td>
<td>8</td>
</tr>
<tr>
<td>Math 171 Calculus I</td>
<td>4</td>
</tr>
</tbody>
</table>

*Phys 101-102 acceptable if taken before major is declared and grade is C or above.

IV. Recommended Geology Electives

Geol 320 Field Trip Prep; Geol 321 Field Trip; Geol 322 Oceanography; Geol 402 Earth Resources.

V. Recommended Outside Electives


MINOR IN GEOLOGY

Geol 101 or 102, and 12 hours of upper-division credit in geology courses selected in consultation with a geology faculty adviser.
Preparation for Graduate Study

As preparation for work toward an advanced degree in geology, a student should have completed, or plan to take without graduate credit, the following or their equivalents: Geol 102, 307, 308, 310, 340, 350, 355, 361, 362, 410, 420; one year of general physics; one year of general inorganic chemistry; mathematics through one semester of calculus.

Department of History


Offerings in the field of history may be classified as American, Asian, European, and Latin American.

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, archival work, and librarianship. Double majors or complementary minors combining history with other fields are easily arranged.

The department offers courses of study leading to the degrees of Bachelor of Arts in History, Bachelor of Arts in Social Studies, Master of Arts in History, and Doctor of Philosophy. In cooperation with the Departments of English and Speech, the department participates in the interdisciplinary program in American Studies leading to the degree of Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Hist
102 [S] Modern Europe 3 War, revolution, industrialization, culture—18th to 20th centuries; imperialism, democracy, and totalitarianism; Europe's leaders Napoleon to Hitler; post-WW II confrontations.
110 [S] American History to 1865 3
111 [S] American History Since 1865 3
198 [S] History Honors 3
201 [S] Introduction to Asian American History 3 Same as AASt 201.
208 American Indians to 1830 3 Same as Na Am 208.
209 American Indians from 1830 3 Same as Na Am 209.
210 [S] Topics in American History 3 May be repeated for credit; cumulative maximum 6 hours. Intensive and experimental study of special topics.
230 [S] Latin America, The Colonial Period 3
231 [S] Latin America, The National Period 3
270 [S] Introduction to South Asian Culture 3 Hinduism, Buddhism, Jainism; traditional social organization, impact of Islam, British imperialism, independent India and Pakistan.
275 [S] Introduction to East Asian Culture 3 Civilizations of China and Japan.
298 History of Women in American Society 3 An examination of the roles of women—social, economic, political—in American history from colonial times to the present.
301 History of Christianity 3 Christianity and its impact on Europe and America from Roman times to present-day America.
310 [S] Afro-American History I 3 Same as Bl St 310.
311 [S] Afro-American History II 3
312 [S] History of Canada 3
313 Civil Rights 3 Same as Bl St 313
314 African History 3 Same as Bl St 314.
316 Introduction to American Studies 3 Same as Engl 316.
325 History of American Agriculture and Rural Life 3 Land, labor, crop and animal husbandry, markets, and patterns in rural family and community life, colonial times to the present.
331 Race and Social History in Latin America 3 Social development of Blacks, Whites, and Indians in Latin America from the conquest to the modern era.
340 [H] Ancient Greece 3 History and culture of the pre-Christian Greek civilization.
341 [S] Rome: Republic and Empire 3 His-
istory and culture of the Roman world from the independence of the city to the onset of the medieval order.

342 [H] History of England to 1485 3 Survey of English history; intellectual and cultural development.

343 [H] History of England Since 1485 3 Continuation of Hist 342. Survey of English history from the reign of the first Tudor monarch, Henry VII, to the present welfare-state era.

370 [S] History of Blacks in the Western U.S. 3 Same as Bl St 370.

374 [H] Pre-Modern History of East Asia 3 Geographical, socioeconomic, and intellectual influences upon the development of China, Japan, and Korea to the 19th century.

381 [S] Science in Western Civilization Through Newton 3 Development of Western science and its influence on European culture and society.

382 [S] Science in Western Civilization from Newton to Einstein 3


386 Military History of World War II 3 All theaters of war, 1939-45; Europe, North Africa, Atlantic, Asia, and Pacific, including Germany's campaigns in the east.

390 Introduction to Museology 3 History, theory, and practice of museums; field trips. Cooperative course taught at the University of Idaho.

398 History of Women in the American West 3 The history of women in the American Northwest through women's literature, archives, and oral history.

399 [S] Historical Biography 3 May be repeated for credit; cumulative maximum 6 hours. Lives of influential American and world figures illustrative of the age in which they lived.

407 American Urban History 3 Process of urbanization and related developments in American history from the 17th century to the present. Credit not granted for both Hist 407 and 507.

408 Indians of the Northwest 3 Same as Na Am 408. Credit not granted for both Hist 408 and 508.

409 Indians of the Southwest 3 Same as Na Am 409. Credit not granted for both Hist 409 and 509.

411 American Diplomatic History 1776-1914 3 Policies and principles characteristic of American diplomacy from 1776 to 1914. Credit not granted for both Hist 411 and 511.

412 American Diplomatic History in the Twentieth Century 3 Credit not granted for both Hist 412 and 512.

413 Early American History to 1750 3 The cultures and interactions of Native Americans, Europeans, and Africans; development of colonial American societies and institutions.

414 The Era of the American Revolution 3 The origins of the American Revolution, the War of Independence, and the emergence of republican government and society.

415 New American Republic 1789-1845 3 Social and political history of the United States from 1789 to 1845; Jeffersonian and Jacksonian eras. Credit not granted for both Hist 415 and 515.

416 Civil War and Reconstruction 3 The Civil War as a problem in historical causation and the social, political, and economic impact of the war. Credit not granted for both Hist 416 and 516.

417 Rise of Modern America 3 Response to industrialism in the Gilded Age and the reform movements of Populism and Progressivism. Credit not granted for both Hist 417 and 517.

418 United States 1914-1941 3 America through World War I, cultural tensions of the Twenties, and the crises of Depression and impending war. Credit not granted for both Hist 418 and 518.

419 United States 1941-Present 3 International and domestic impact of World War II, era of McCarthyism, American aspirations, tensions and conflicts in the "post-industrial" era. Credit not granted for both Hist 419 and 519.

420 American Constitutional History 3 Prereq Hist 110 or Pol S 101. Credit not granted for both Hist 420 and 520.

421 The American Frontier 3 The American frontier and its importance in American history. Credit not granted for both Hist 421 and 521.

422 History of the Pacific Northwest 3 Fulfills the teaching certification requirement in state history and government in Washington and other Pacific Northwest states. Credit not granted for both Hist 422 and 522.

423 American Intellectual and Social His-
tory 3 Ideas influential on American society, emphasizing Puritanism, the American Revolution, abolitionism, science, Darwinism, Pragmatism, modern political ideology, and religion. Credit not granted for both Hist 423 and 523.

424 South Africa: From Pre-European Settlement to Present 3 Same as Bl St 424.

427 Public History: Theory and Methodology 3 An introduction to the broad range of non-traditional careers in history. Credit not granted for both Hist 427 and 527.

429 Seminar in American History 3 May be repeated for credit.

430 History of Mexico 3 War of independence, 19th century Mexico and the liberal-conservative struggle; modern Mexico since the Revolution of 1910.

432 Twentieth Century Latin America 3 Contemporary developments, policies and trends in the Latin American states.

433 History of Cuba and the Caribbean 3 Historical development of the Caribbean, with emphasis on Cuba, from the Spanish arrival to Castro's revolution.

439 Seminar in Latin American History 3 May be repeated for credit.

440 [H] The Early Middle Ages, 330-1050 3 Western Europe, the Byzantine Empire, and Islam from the dissolution of classical Roman civilization to the 11th century revival.

441 [H] The Later Middle Ages, 1050-1500 3 Western European and Byzantine civilizations from the 11th century revival to the advent of the Renaissance in the West.

444 [H] The Renaissance 3 Political, cultural, and religious history of Europe, 1300-1500.

445 The Reformation 3 Political, cultural, and religious history of Europe, 1500-1650.

446 (346) Age of Louis XIV: Europe 1600-1789 3 Early modern Europe emphasizing artistic, intellectual, and political trends.

447 Europe in the French Revolutionary and Napoleonic Era, 1789 to 1815 3 Credit not granted for both Hist 447 and 547.

448 Europe: War, Revolution, Nationalism 1815-1914 3 Marxist and non-Marxist revolutions, trends towards total war, nation building, 19th century imperialism; from apparent stability to chronic instability.

449 Europe and Two World Wars, 1914-1945 3 Political, intellectual, economic, and international aspects of European life during and between two world wars. Credit not granted for both Hist 449 and 549.

450 Europe: Postwar to Detente 3 Post World War II collapse, confrontation, recovery, integration movements, new balance; postwar background to current European problems and developments. Credit not granted for both Hist 450 and 550.

455 Tudor England 3 Credit not granted for both Hist 455 and 555.

456 Stuart England 3 Credit not granted for both Hist 456 and 556.

459 Modern Britain 3 Britain and the Empire from the Napoleonic wars to the present. Credit not granted for both Hist 459 and 559.

460 European Diplomacy 1848 to 1914 3

461 European Diplomacy Since 1914 3 Credit not granted for both Hist 461 and 561.

462 History of Imperial Russia 3 History and culture of Imperial Russia from Peter the Great to the 1905 revolution.

463 History of the Soviet Union 3 The Russian revolutions and the Soviet regime: 1905 to the present.

465 Communist East Europe 3 History, government, and culture of the countries which comprise the Soviet East European bloc; emphasis since 1945.

467 The Enlightenment 3 Social and intellectual currents of eighteenth century Europe. Credit not granted for both Hist 467 and 567.

468 Hitler and Nazi Germany 3 Rise and fall of Nazism and Hitler; Nazi racial theories, Hitler's triumph, the Third Reich, Holocaust and "Goetterdaemmerung." Credit not granted for both Hist 468 and 568.

469 Seminar in European History 3 May be repeated for credit.

470 India, 1526-1947 3 Muslim empire, its intellectual, artistic, architectural traditions, their impact upon Hindu culture; British rule, nationalism, Gandhi and the freedom movement.

471 Contemporary South Asia 3 Performance of the governments of India, Pakistan, Bangladesh; population pressures and their implications for foreign aid and world food supplies.

475 Twentieth Century East Asia 3
Revolutionary China, 1800 to Present 3 Nature and effects of revolution in China from 1800 to present. Credit not granted for both Hist 476 and 576.

Modern Japanese History 3 The development of state and society in Japan from 1800 to present. Credit not granted for both Hist 477 and 577.

Methods of Teaching Social Studies 3 Methods, resources, selection of content, past and present issues in social studies education. 485

Inter-American Relations 3 Same as Pol S 414. Credit not granted for both Hist 485 and 585.

United States Foreign Relations 3 Same as Pol S 427. Credit not granted for both Hist 486 and 586.

American Political Thought 3 Same as Pol S 434. Credit not granted for both Hist 487 and 587.

Classical Political Thought 3 Same as Pol S 437.

Recent Political Thought 3 Same as Pol S 438.

Politics of Developing Nations 3 Same as Pol S 435. Credit not granted for both Hist 490 and 590.

Seminar 3 May be repeated for credit; cumulative maximum 6 hours.

Special Problems V 1-4 May be repeated for credit.

Directed Study in Museology V 1-4 Individual work related to student's museum interests—reading, research, specialized projects. Cooperative course taught at the University of Idaho.


American Urban History 3 Graduate level counterpart of Hist 407; additional requirements. Credit not granted for both Hist 407 and 507.

Indians of the Northwest 3 Graduate level counterpart of Hist 408; additional requirements. Credit not granted for both Hist 408 and 508.

Indians of the Southwest 3 Graduate level counterpart of Hist 409; additional requirements. Credit not granted for both Hist 409 and 509.

Field Course in American History 3 May be repeated for credit. Readings and interpretive problems of American history.

American Diplomatic History 1776-1914 3 Graduate level counterpart of Hist 411; additional requirements. Credit not granted for both Hist 411 and 511.

American Diplomatic History in the Twentieth Century 3 Graduate level counterpart of Hist 412; additional requirements. Credit not granted for both Hist 412 and 512.

Seminar in American Studies 3 May be repeated for credit. Same as Engl 513.

New American Republic 1789-1845 3 Graduate level counterpart of Hist 415; additional requirements. Credit not granted for both Hist 415 and 515.

Civil War and Reconstruction 3 Graduate level counterpart of Hist 416; additional requirements. Credit not granted for both Hist 416 and 516.

Rise of Modern America 3 Graduate level counterpart of Hist 417; additional requirements. Credit not granted for both Hist 417 and 517.

United States 1914-1941 3 Graduate level counterpart of Hist 418; additional requirements. Credit not granted for both Hist 418 and 518.

United States 1941-Present 3 Graduate level counterpart of Hist 419; additional requirements. Credit not granted for both Hist 419 and 519.

American Constitutional History 3 Graduate level counterpart of Hist 420; additional requirements. Credit not granted for both Hist 420 and 520.

The American Frontier 3 Graduate level counterpart of Hist 421; additional requirements. Credit not granted for both Hist 421 and 521.

History of the Pacific Northwest 3 Graduate level counterpart of Hist 422; additional requirements. Credit not granted for both Hist 422 and 522.

American Intellectual and Social History 3 Graduate level counterpart of Hist 423; additional requirements. Credit not granted for both Hist 423 and 523.

Seminar in American History 3 May be repeated for credit. Prereq 12 hrs Hist 425.

Seminar in American Diplomatic History 3 May be repeated for credit. Research in American diplomacy and a survey of pertinent literature in the field.

Public History: Theory and Methodology 3 Graduate level counterpart of Hist 427; additional requirements.
Credit not granted for both Hist 427 and 527.

528 Seminar in Public History 3 The development of skills at the graduate level to be used in non-traditional careers for historians.

532 The Mexican Revolution 3 The course, nature, and consequences of the revolutionary upheaval which began in 1910.

538 (530) Seminar in Latin American History 3 May be repeated for credit. Prereq 12 hrs Hist.

540 Seminar in Modern European History 3 May be repeated for credit. Prereq 12 hrs Hist.

542 Seminar in Renaissance-Reformation 3 May be repeated for credit. Research in various problems in Renaissance and Reformation history.

545 Historical Archaeology 3 Excavation and analysis of historical archaeological sites; acculturational implications. Cooperative course taught at the University of Idaho.

547 Europe in the French Revolutionary and Napoleonic Era, 1789 to 1815 3 Graduate level counterpart of Hist 447; additional requirements. Credit not granted for both Hist 447 and 547.

548 Europe and the World, 1815 to 1914 3 Graduate level counterpart of Hist 448; additional requirements. Credit not granted for both Hist 448 and 548.

549 Europe and Two World Wars, 1914-1945 3 Graduate level counterpart of Hist 449; additional requirements. Credit not granted for both Hist 449 and 549.

550 Europe: Postwar to Detente 3 Graduate level counterpart of Hist 450; additional requirements. Credit not granted for both Hist 450 and 550.

555 Tudor England 3 Graduate level counterpart of Hist 455; additional requirements. Credit not granted for both Hist 455 and 555.

556 Stuart England 3 Graduate level counterpart of Hist 456; additional requirements. Credit not granted for both Hist 456 and 556.

559 Modern Britain 3 Graduate level counterpart of Hist 459; additional requirements. Credit not granted for both Hist 459 and 559.

561 European Diplomacy Since 1914 3 Graduate level counterpart of Hist 461; additional requirements. Credit not granted for both Hist 461 and 561.

567 The Enlightenment 3 Graduate level counterpart of Hist 467; additional requirements. Credit not granted for both Hist 467 and 567.

568 Hitler and Nazi Germany 3 Graduate level counterpart of Hist 468; additional requirements. Credit not granted for both Hist 468 and 568.

569 Field Course in Modern European History 3 May be repeated for credit; cumulative maximum 6 hours. Readings and interpretive problems of European history.

570 Seminar in Population and Quantitative History 3 Introduction to concepts and methods; applications to social and political history.

576 Revolutionary China, 1800 to Present 3 Graduate level counterpart of Hist 476; additional requirements. Credit not granted for both Hist 476 and 576.

577 Modern Japanese History 3 Graduate level counterpart of Hist 477; additional requirements. Credit not granted for both Hist 477 and 577.

580 Historiography 3 Prereq 20 hrs Hist.

581 American Historiography 3

585 Inter-American Relations 3 Same as Pol S 514. Graduate level counterpart of Hist 485; additional requirements. Credit not granted for both Hist 485 and 585.

586 United States Foreign Relations 3 Same as Pol S 527. Graduate level counterpart of Hist 486; additional requirements. Credit not granted for both Hist 486 and 586.

587 American Political Thought 3 Same as Pol S 534. Graduate level counterpart of Hist 487; additional requirements. Credit not granted for both Hist 487 and 587.

590 Politics of Developing Nations 3 Same as Pol S 535. Graduate level counterpart of Hist 490; additional requirements. Credit not granted for both Hist 490 and 590.

595 (585) The Teaching of History in College 1 Theory, problems, and methods of teaching history at the college level.

597 Seminar in History 2 or 3 May be repeated for credit.

600 Special Projects or Independent Study Variable credit.

700 Master’s Research, Thesis, and/or Examination Variable credit.

702 Master’s Special Problems, Directed
Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses. A grade of C or better is required in all history courses used to fulfill the requirements for this major.

It is assumed that prior to the junior year the student will have completed courses meeting general university and College of Sciences and Arts requirements for graduation and should have completed the following:

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Hist 100- or 200-level courses</td>
<td>12</td>
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<tr>
<td>Pol S 101 or 102</td>
<td>3</td>
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<tr>
<td>Three courses from the following:</td>
<td></td>
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<tr>
<td>Social Sciences (Anth 101; Econ 102</td>
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<tr>
<td>or 201; Soc 101; Pol S 206 or 222;</td>
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<tr>
<td>Psych 102; one from AASat 201,</td>
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<tr>
<td>Bl St 101, Ch St 110, Na Am 101, or W St</td>
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<tr>
<td>200); Humanities (F A 201, 202, or 203;</td>
<td></td>
</tr>
<tr>
<td>Hum 101, 202, 204, or 350; Phil 101, 201,</td>
<td></td>
</tr>
<tr>
<td>220, or 260)</td>
<td></td>
</tr>
<tr>
<td>At least one course must be taken from each area</td>
<td>9-10</td>
</tr>
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</table>

Junior Year

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<tr>
<th>Semester</th>
<th>Course</th>
<th>Hours</th>
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<tr>
<td>First</td>
<td>Hist 300- or 400-level</td>
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<tr>
<td></td>
<td>Minor Elective</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Literature Elective (Engl or For L)</td>
<td>3</td>
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<td>Second</td>
<td>Hist 300- or 400-level</td>
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Senior Year

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<tr>
<td>Second</td>
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<td>Minor Elective</td>
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<tr>
<td></td>
<td>Electives</td>
<td>9</td>
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</tbody>
</table>

The 30 hours of history required must include 6 hours (any level) in each of these fields: United States, Europe, and other fields and areas (e.g., Latin America, Asia, Canada).

At least one history seminar is required for a major.

Social Studies

Students desiring a teaching major in the social studies should see the teacher-education program outlined in the Department of Education. Enrollment will be in the Department of History and the Department of Education.

Teaching Majors in History

Students with a program in education who wish to acquire a teaching major in history should enroll in both the Department of History and in the Department of Education while fulfilling the departmental requirements for a major in history.

Minor in History

A minor in history requires 16 hours, 8 of which must be in upper-division courses.

Preparation for Graduate Study

Students who have had basic undergraduate training in European and American history (approximately 12 hours) and who have had undergraduate majors in such subjects as American literature, economics, anthropology, and political science may be well prepared for graduate study in several fields of specialization in history. Adequate opportunities are provided for removing deficiencies by taking appropriate courses or special examinations.

Undergraduates who are pursuing their studies at other institutions or through other curricula at this institution and who contemplate graduate work in this department should select courses similar to those required in the above schedule of studies.

Home Economics

For instructional staff, see departments in the College of Home Economics.

Description of Courses

For explanation see Index under "Symbols".

H E

199 Perspectives in Home Economics 2 Explores and integrates careers and curricula through field experiences; family units, life style, personal options; professional competencies.

404 Independent Living Skills for Handi-
capped 2 Prereq 9 hrs Psych and Soc
3 hrs Bio S. Development of independent living skills for persons with physical limitations and/or learning disabilities.

499 Special Problems V 1-4 May be repeated for credit.
600 Special Projects or Independent Study Variable credit.
700 Master's Research, Thesis, and/or Examination Variable credit.
702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

Home Economics Education

Associate Professor, B. L. Trout; Assistant Professors, B. J. Johnson, M. L. Riggers.

The course of study leads to the degree of Bachelor of Science in Home Economics and meets requirements for the Provisional Teaching Certificate and the Certificate in Vocational Home and Family Life Education.

Schedule of Studies

At least 40 hours of the total hours required for the bachelor's degree in this program must be in upper-division courses. A minimum of 42 hours of home economics subject matter (CFS, CIDT, HNF) is required for graduation.

Required Courses

<table>
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<th>Hours</th>
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<td>Engl 101 Composition</td>
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<td>Com Prof Elective</td>
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<td>Arts and Hum Electives</td>
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<td>Soc 101 Introduction</td>
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<td>Psych 102 Intro Psych</td>
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<td>Econ 201 Principles</td>
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<tr>
<td>Bact 101 Elem Bact</td>
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<tr>
<td>Chem 101 or 105</td>
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<td>Zool 251 Intro Hum Physiol</td>
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<td>CFS 247 Family Relationships</td>
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<td>CFS 240 Child Development</td>
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<tr>
<td>CFS 242 Directed Observation</td>
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<td>CFS Elective</td>
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<tr>
<td>CFS 350 Decision Making</td>
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<td>CFS 353 Family Housing</td>
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<td>CFS 450 Home Management</td>
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<td>CFS 352 or 452</td>
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<td>I D 101 Basic Environmental Design</td>
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<tr>
<td>C T 215 Textiles</td>
<td>3</td>
</tr>
<tr>
<td>C T 216 Cloth Constr</td>
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<tr>
<td>C T 217 Clothing</td>
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<tr>
<td>HNF 120 or 220</td>
<td>3</td>
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<tr>
<td>HNF 130 or 333</td>
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<td>HNF 266 Household Equip</td>
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<td>Home Economics Elective</td>
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<td>Educ 300 Intro Field Exper</td>
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<tr>
<td>Educ 303 Secondary Schools</td>
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<td>VTE 343 Teaching Home Ec</td>
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<td>Educ 402 Eval of Learn</td>
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<td>Educ 358 or 359</td>
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<td>Educ 403 or 404</td>
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<td>Educ 405 or 406</td>
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<td>VTE 440 or 441</td>
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<td>VTE 434 Home Ec Ed</td>
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Option A
(In addition to required courses above)

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<tr>
<td>Chem 101 or 106</td>
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<td>Chem 240 Organic</td>
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Option B
(In addition to required courses above)

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<td>Soc 270, 330, 331, 351 or Econ 312 or Anth 301</td>
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</tr>
<tr>
<td>Social Science Elective</td>
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</tbody>
</table>

Honors Program

V. N. Bhatia, Director

The primary objective of the Honors Program is to provide enriched educational opportunities for qualified students. The program offers a plan to promote an appreciative understanding of the physical and cultural world, and it is designed to supplement the more specialized training in the major field. It also provides the opportunity and the stimulus for students to develop their creative abilities.

The Honors Program involves students from all departments and colleges and includes honors courses throughout the student's undergraduate career. Each department or college, if it wishes, may offer special work for its students in addition to the University Honors courses.

Freshman students entering the Honors Program must take Engl 198 in the first semester, unless they are advised otherwise by the Director of the Honors Program. Students who are qualified to enroll in calculus (Math 171 or 172) are considered to have completed the
minimum amount of mathematics required for the Honors Program. (Additional mathematics may be taken if the student wishes and must be taken if required by the student's major field.) Students not qualified to enroll in calculus should enroll in Math 198 or Phil 198 or an appropriate mathematics course. Students who are not admitted to the Honors Program as incoming freshmen may petition to enter it any time after the end of their first semester but not later than the beginning of the junior year. For continued enrollment in the Honors Program, students must maintain an overall B average (3.00) and must maintain this same average in honors work. Students in the Honors Program are not required to complete the "General University Requirements for Graduation," except for the foreign language requirement, where it applies.

A student may drop out of the Honors Program at any time within existing university rules, and the honors courses taken will be applied toward the General University Requirements for Graduation.

Students who satisfactorily complete all Honors Program requirements, earn a 3.00 grade point average in honors courses, and a cumulative grade point average of 3.00 will receive an Honors Certificate provided they have completed a minimum of 14 credits of Honors courses and seminars plus the required independent study. In addition, all students with a minimum of 30 semester hours of graded work at WSU will graduate cum laude if their cumulative grade point average for all WSU work is 3.30 but less than 3.80, or summa cum laude if the cumulative average is 3.80 or above.

Honors courses are open to students enrolled in the Honors Program. Other students of comparable ability may be permitted to enroll in individual classes by the Director of the Honors Program if space is available.

**Description of Courses**

For explanation see Index under "Symbols"

<table>
<thead>
<tr>
<th>Code</th>
<th>Course</th>
<th>Description</th>
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<tbody>
<tr>
<td>Anth</td>
<td>198</td>
<td>[S] Anthropology Honors 3</td>
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<tr>
<td>Econ</td>
<td>198</td>
<td>[S] Economics Honors 3</td>
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<td>Engl</td>
<td>198</td>
<td>[W] English Composition Honors 3</td>
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<tr>
<td>Engl</td>
<td>199</td>
<td>[H] English Composition and Literature Honors 3</td>
</tr>
<tr>
<td>Hist</td>
<td>198</td>
<td>[S] History Honors 3</td>
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<tr>
<td>Hum</td>
<td>198</td>
<td>[H] Humanities Honors 3</td>
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<tr>
<td>Math</td>
<td>198</td>
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<tr>
<td>Phil</td>
<td>198</td>
<td>[H] Philosophy Honors 3</td>
</tr>
<tr>
<td>Pol S</td>
<td>198</td>
<td>[S] Political Science Honors 3</td>
</tr>
<tr>
<td>Psych</td>
<td>198</td>
<td>[S] Psychology Honors 3</td>
</tr>
<tr>
<td>Soc</td>
<td>198</td>
<td>[S] Sociology Honors 3</td>
</tr>
<tr>
<td>Span</td>
<td>198</td>
<td>Beginning Spanish Honors 4</td>
</tr>
<tr>
<td>Span</td>
<td>199</td>
<td>Continuing Spanish Honors 4</td>
</tr>
<tr>
<td>U H</td>
<td>200</td>
<td>Sophomore Summer Reading Examination V 1-3 May be used to fulfill the independent study requirement for the Honors Program. Examination to be taken during first six weeks of first semester of sophomore year. Variable credit depending on extent and quality of summer reading.</td>
</tr>
<tr>
<td>330</td>
<td>Development of Western Civilization 3 Required of all Honors Program students in their junior or senior year.</td>
<td></td>
</tr>
<tr>
<td>350</td>
<td>Development of Eastern Civilization 3 Required of all Honors Program students in their junior or senior year.</td>
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</tr>
<tr>
<td>400</td>
<td>Senior Summer Reading Examination V 1-3 May be repeated for credit; cumulative maximum 6 hours. May be used to fulfill the independent study requirement for the Honors Program.</td>
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<tr>
<td>430</td>
<td>Foreign Study Practicum and Reports 2 By interview only. Special assignments and reports related to foreign study programs.</td>
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</tr>
<tr>
<td>440</td>
<td>Domain of the Arts 3 Required of all Honors Program students in their junior or senior year.</td>
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</tr>
<tr>
<td>450</td>
<td>Senior Thesis or Project V 1-4 May be repeated for credit. Thesis or project directed by student's major department.</td>
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<tr>
<td>460</td>
<td>Seminar 2 May be repeated for credit. Varying topics.</td>
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</tr>
<tr>
<td>499</td>
<td>Special Problems V 1-4 May be repeated for credit.</td>
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</tbody>
</table>

**Schedule of Studies**

A bachelor's degree earned through the Honors Program ordinarily requires approximately the same number of total semester hours as re-
quired by the corresponding non-honors curriculum in the major field concerned. At least 40 of the total hours must be in upper-division courses.

For Honors Program students the following courses or approved substitutes are required. Honors Program students are strongly urged to gain a proficiency in a foreign language and to take advantage of the Study Abroad opportunities offered by Washington State University. (In five-year programs, the junior and senior years may be interpreted as III, IV, or V.)

The student in the first two years must take three of the following courses in social science: Anth 198, Econ 198, Hist 198, Pol S 198, Psych 198, Soc 198. The student must also take Phil 198 or Math 198, or an approved substitute if not enrolled in calculus or not qualified to enroll in it. Sophomores are required to complete one of the U H 460 Seminars or Hum 198. Honors students are required to complete three credits of independent study prior to their last semester. This may be done through Summer Reading (U H 200, 300, or 400), U H 499, or other approved arrangements.

<table>
<thead>
<tr>
<th>Freshman Year</th>
<th>Hours</th>
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<tbody>
<tr>
<td><strong>First Semester</strong></td>
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<tr>
<td>Engl 198 Honors</td>
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<tr>
<td>Math 198 or Phil 198 (or</td>
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<tr>
<td>appropriate mathematics course)</td>
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<td>Dept Requirements or Electives</td>
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<td><strong>Second Semester</strong></td>
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<td>Engl 199 Honors</td>
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<td>Social Science Honors</td>
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<table>
<thead>
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<td>U H 200 Summer Reading Exam</td>
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<tr>
<td>U H 460 or Hum 198</td>
<td>2-3</td>
</tr>
<tr>
<td>Chem 298 Honors</td>
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<td>Social Science Honors</td>
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<td>Dept Requirements or Electives</td>
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<tr>
<td><strong>Second Semester</strong></td>
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</tr>
<tr>
<td>U H 460 or Hum 198</td>
<td>2-3</td>
</tr>
<tr>
<td>Bio S 298 Honors</td>
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<tr>
<td>Social Science Honors</td>
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<table>
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<th>Junior Year</th>
<th>Hours</th>
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<td>U H 300 Summer Reading Exam</td>
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</tr>
<tr>
<td>U H 460 or Hum 198</td>
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<tr>
<td>U H 330 Western Civilization</td>
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<td>Dept Requirements or Electives</td>
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</table>

**Second Semester**                | Hours |
| U H 460 or Hum 198                 | 2-3   |
| U H 350 Eastern Civilizations     | 3     |
| Dept Requirements or Electives    | 13    |

**Senior Year**                    | Hours |
| **First Semester**                |       |
| U H 400 Summer Reading Exam       | 1-3   |
| U H 460 or Hum 198                 | 2-3   |
| U H 440 Domain of the Arts        | 3     |
| Dept Requirements or Electives    | 11    |
| **Second Semester**               |       |
| U H 460 or Hum 198                 | 2-3   |
| U H 450 Senior Thesis or Project  |       |
| (if required by dept)             | 1-4   |
| Dept Requirements or Electives    | 12    |

Courses printed in Roman type are required for graduation; those in italics are optional.

### Department of Horticulture and Landscape Architecture

Professor and Department Chair, H. P. Rasmussen. Horticulture: Professors, W. B. Ackley, D. R. Bienz, W. M. Iritani, E. W. Kalin, P. E. Larten, M. E. Patterson, B. W. Pooviah; Associate Professor, L. K. Hiller, R. A. Kennedy, W. H. Louscher, K. A. Schekel; Assistant Professor, R. L. Wample; Extension Specialists, R. E. Thornton, R. B. Tukey.

Landscape Architecture: Associate Professors, P. R. Steiner, K. A. Struckmeyer; Assistant Professors, I. E. Boehm-Hsu, J. A. McQuary.

### Horticulture

Courses in horticulture are designed to give instruction in the principles and practices of fruit and vegetable production and utilization, floriculture, and nursery management. Emphasis is given to the principles of plant production, management, and understanding plant growth and development upon which cultural practices are based. The curricula are designed to fit men and women for work in fruit or vegetable growing, in fruit and vegetable handling and processing, in marketing organizations, in fieldmen positions, in state and federal departments of agriculture, and in commercial nursery work and related fields.

Courses in ornamental horticulture prepare students for work in greenhouse and nursery management and florist and garden center operations.
The Department of Horticulture and Landscape Architecture offers an undergraduate minor in the area of fruit and vegetable production and ornamental horticulture.

An interdisciplinary curriculum in integrated pest management is available to those students whose interests span the areas of horticulture and pest management. The curriculum is described under the General Agriculture section of this bulletin.

The department offers courses of study leading to the degrees of Bachelor of Science in Horticulture, Bachelor of Science in Landscape Architecture, Master of Science in Horticulture, and Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Horticulture

Hort

101 Plants and Gardens 3 (2-3) Indoor and outdoor plants and gardens for appreciation and pleasure; fruits, vegetables, flowers, ornamentals, and native plants. Credit not granted for both Hort 101 and 130.

130 House Plants and Home Gardening 3 Care and identification of plants for inside the home; planning, planting, and care of flowers and vegetables gardens. Credit not granted for both Hort 101 and 130.

134 Home Flower Arrangement 2 (1-3) Principles, theory, and history of flower design; use and selection of flowers, containers, and color harmonies; conditioning of cut flowers.

201 Plant/Environment Relations 4 (3-3) Plant development and the environmental factors influencing propagation, productivity and postharvest quality of horticulturally important crops.

231 Landscape Plant Materials I 3 (2-3) Prereq Hort 101 or 201. Characteristics, ecology, nomenclature, identification, selection, and use of important woody and herbaceous landscape plant species.

232 Landscape Plant Materials II 3 (2-3) Prereq Hort 231. Continuation of Hort 231.

251 Propagation of Plants 3 (2-3) Prereq Hort 101 or 201 or Bot 201. Principles and methods of multiplying herbaceous and woody plants and their handling up to usable size. Field trip required.

311 Fruit Growing 3 (2-3) Prereq Hort 201. The principles and practices of deciduous tree fruit production in Washington.

313 Small Fruit Culture 3 Botanical relationships, plant characteristics, fruiting habits, varieties, location, culture, marketing, and utilization of small fruits. Field trip required. (a/y)

320 Commercial Vegetable Crops 3 Prereq Hort 201 or plant science course; Soils 201. Commercial vegetable production; importance, climate, fertility and cultural requirements; pest control, harvesting, and marketing; greenhouse and tropical vegetables.

321 Commercial Vegetable Crops Laboratory 1 (0-3) Prereq Hort 320. Principles and concepts of vegetable plant characteristics, cultivars, production, nutrition, and culture. Field trip required.

334 (335) Greenhouse Construction and Management 3 (2-3) Prereq Hort 201; Soils 201; 1 yr Chem. Methods and materials; heat, ventilation, and light control; soil, fertilizer, and water management as related to greenhouse production. Field trip required.

335 (334) Nursery Practices and Management 3 (2-3) Prereq Hort 201, 334; 1 yr Chem. Establishment and management of wholesale and retail nurseries. Field trip required. (a/y)

336 Commercial Flower Design and Retail Shop 3 (1-6) Prereq Hort 134, 335. For Floriculture majors. Design and use in commercial shops; church and hall decorations; floral merchandizing and supplies, store management and shop arrangement.

399 Professional Work Experience V 1-4 May be repeated for credit; cumulative maximum 8 hours. Prereq basic horticulture. By interview only. Planned and supervised work experience.

416 Physiology of Crop Plants 3 Prereq Bot 320. Growth and development of crop plants and the effect of environment on physiological processes.


418 Post-Harvest Physiology 3 (2-3) Prereq Hort 201; Bot 320. Physiological and chemical basis for handling and storage practices; dormancy, maturation, ripen-
ing, and senescence phenomena; physiological disorders; refrigeration principles. Field trip required.

420 Potato Physiology and Production Technology 2 (1-3) Prereq Bot 320. Plant and tuber physiology; physical, chemical, physiological and technical concepts of production, storage, and processing of potatoes. Field trip required. Joint listing with the University of Idaho. Credit not granted for both Hort 420 and 520. (a/y)

425 Current Topics in Horticulture 3 May repeated for credit; cumulative maximum 6 hours. Prereq Hort 311, 320, or 334; Bot 320; GenCB 301. Classical, current scientific, and popular literature on horticultural topics.

438 Greenhouse Ornamental Plant Production 4 (3-3) Prereq Hort 334. History, culture, propagation, harvesting, packing, and marketing of ornamental greenhouse crops. Field trip required. (a/y)

445 (345) Plant Breeding 3 Same as Agron 445.

456 Seminar 1 May be repeated for credit; cumulative maximum 2 hours. Current literature and special reports.

469 Vegetable Seed Production 1 Same as Agron 469.

470 Potato Science 1 Prereq Hort 201. Origin, culture, harvesting, handling, storage, and marketing of the potato. Cooperative course taught at the University of Idaho. (a/y)

492 Instructional Practicum in Horticulture V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prereq junior or senior. By interview only.

498 Greenhouse Construction and Management V 1-3 Methods and materials used in greenhouse construction, environmental control, and management for greenhouse crop production.

499 Special Problems V 1-4 May be repeated for credit.

501 Horticultural Research Techniques 1 May be repeated for credit; cumulative maximum 4 hours. Specialized techniques and methods useful in horticultural research.

503 Environmental Physiology V 1-4 May be repeated for credit; cumulative maximum 8 hours. Prereq Bot 320. Advanced topics in the physiological effects of light, temperature, moisture, nutrition, and their management in plant productivity.

509 Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Continuous enrollment required for regularly enrolled graduate students in Hort. Recent developments in horticulture.

510 Graduate Seminar 1 May be repeated for credit; cumulative maximum 4 hours. Literature reviews and research progress reports.

512 Advanced Pomology 3 Modern concepts, research, and commercial problems as reflected in current horticultural literature. (a/y)

516 Plant Growth Regulators 3 Prereq Bot 320. Naturally occurring hormones and synthetic regulators; synthesis, mechanism of action, control of growth and developmental processes; practical applications in agriculture. (a/y)

520 Potato Physiology and Production Technology 2 (1-3) Graduate level counterpart of Hort 420; additional requirements. Credit not granted for both Hort 420 and 520. (a/y)

532 Plant Tissue, Cell, and Organ Culture 3 (2-3) Prereq Bot 320. Organ, tissue, and cell culture and morphogenesis and their contributions, both actual and potential, to current problems in plant science. (a/y)

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

**Schedule of Studies**

Students in horticulture may take work in fruit and vegetable production or ornamental horticulture.

At least 40 of the total hours required for the bachelor's degree in these programs must be in upper-division courses.

**FRUIT AND VEGETABLE PRODUCTION**

**Freshman Year**

<table>
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<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Hort 201 Plant Environment</td>
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<td>Engl 101 Composition</td>
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<tr>
<td>Course</td>
<td>Hours</td>
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<tr>
<td>---------------------------------------------</td>
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</tr>
<tr>
<td>Chem 101 or 105</td>
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<tr>
<td>Hum or Soc S Elective</td>
<td>3</td>
</tr>
<tr>
<td><strong>Second Semester</strong></td>
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<tr>
<td>Bio S 103 Introductory</td>
<td>4</td>
</tr>
<tr>
<td>Ag 205 or Spe Elective</td>
<td>3</td>
</tr>
<tr>
<td>Chem 102 or 106</td>
<td>4</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
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<tr>
<td><strong>Sophomore Year</strong></td>
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<tr>
<td><strong>First Semester</strong></td>
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<tr>
<td>Bot 201 Intermediate</td>
<td>4</td>
</tr>
<tr>
<td>Hort 251 Propagation</td>
<td>3</td>
</tr>
<tr>
<td>Ag Ec 201 or Econ 201</td>
<td>3-4</td>
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<td>Soils 201 Soils</td>
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<td>Hum or Soc S Elective</td>
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<tr>
<td>Hort 311 Fruit Growing</td>
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<td>Bot 320 Plant Physiology</td>
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<td>Chem 240 Elem Org Chem</td>
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<td>Actg 230 Prin of Actg</td>
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<td><strong>Junior Year</strong></td>
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<td>Hort 320 Veg Crops</td>
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<td>PL P 329 General</td>
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<td>Soils 301 Soil Management</td>
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<td>Hort Elective*</td>
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</tr>
<tr>
<td>Electives</td>
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<td><strong>Second Semester</strong></td>
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<tr>
<td>Entom 340 Ag Entomology</td>
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<tr>
<td>GenCB 301 Genetics</td>
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<td>Ag M Elective</td>
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<tr>
<td>Hort Elective*</td>
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<td>Elective</td>
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<td><strong>Summer Session (or semester)</strong></td>
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<td>Hort 399 Professional Work Experience</td>
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<td><strong>Senior Year</strong></td>
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<td>Hort 416 Hort Physiology</td>
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<td>Hort 418 Post-Harvest</td>
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<td>Hort 425 Cur Topic in Hort</td>
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<td>Hort 456 Seminar</td>
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<tr>
<td>Ag Ec 340 Farm Management</td>
<td>3</td>
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<tr>
<td>Electives</td>
<td>3</td>
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<tr>
<td><strong>Second Semester</strong></td>
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<tr>
<td>Hort 417 Plant Pest Control</td>
<td>3</td>
</tr>
<tr>
<td>Hort 456 Seminar</td>
<td>1</td>
</tr>
<tr>
<td>Electives</td>
<td>12</td>
</tr>
</tbody>
</table>

*Electives totaling at least 6 hours must be taken from Hort 313, 321, 334, 399, 420, 445, 469, 470.

Courses printed Roman type are required for graduation; those in italics are optional.

**ORNAMENTAL HORTICULTURE**

**Freshman Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Hort 101 or 201</td>
<td>3</td>
</tr>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Chem 101 or 105</td>
<td>4</td>
</tr>
<tr>
<td>Hum or Soc S Elective</td>
<td>6</td>
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<tr>
<td><strong>Second Semester</strong></td>
<td></td>
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<tr>
<td>Bio S 102 or 103</td>
<td>4</td>
</tr>
<tr>
<td>Chem 102 or 106</td>
<td>4</td>
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<tr>
<td>Hum or Soc S Elective</td>
<td>6</td>
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<tr>
<td>Option Requirement</td>
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**Sophomore Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Hort 231 Plant Materials I</td>
<td>3</td>
</tr>
<tr>
<td>Chem 240 Elem Org Chem</td>
<td>4</td>
</tr>
<tr>
<td>Ag Ec 201 or Econ 201</td>
<td>3-4</td>
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<tr>
<td>Bot 201 Intermediate</td>
<td>4</td>
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<tr>
<td><strong>Second Semester</strong></td>
<td></td>
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<tr>
<td>Hort 232 Plant Materials II</td>
<td>3</td>
</tr>
<tr>
<td>Hort 251 Propagation</td>
<td>3</td>
</tr>
<tr>
<td>Soils 201 Soils</td>
<td>3</td>
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<tr>
<td>Ag 205 or Spe 102</td>
<td>3</td>
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<tr>
<td>Option Requirement</td>
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**Junior Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Hort 334 Grn Const and Mgt</td>
<td>3</td>
</tr>
<tr>
<td>Bot 320 Plant Physiology</td>
<td>3</td>
</tr>
<tr>
<td>L A 264 Basic Landscape Design</td>
<td>3</td>
</tr>
<tr>
<td>Soils 301 Soil Management</td>
<td>2</td>
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<tr>
<td>Option Requirement</td>
<td>3</td>
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<tr>
<td><strong>Second Semester</strong></td>
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<tr>
<td>Actg 230 Prin of Actg</td>
<td>4</td>
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<tr>
<td>Entom 340 Ag Entomology</td>
<td>3</td>
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<tr>
<td>Pl P 329 General</td>
<td>3</td>
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<tr>
<td>Ag M Elective</td>
<td>3</td>
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<tr>
<td>Option Requirement or Elective</td>
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</table>

**Summer Session (or semester)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Hort 399 Professional Work Experience</td>
<td>3</td>
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</tbody>
</table>

**Senior Year**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Hort 320 Veg Crops</td>
<td>3</td>
</tr>
<tr>
<td>Hort 456 Seminar</td>
<td>1</td>
</tr>
<tr>
<td>Hort 425 Cur Topic in Hort</td>
<td>3</td>
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<tr>
<td>Option Requirement or Elective</td>
<td>9</td>
</tr>
<tr>
<td><strong>Second Semester</strong></td>
<td></td>
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<tr>
<td>Hort 456 Seminar</td>
<td>1</td>
</tr>
<tr>
<td>Hort 417 Plant Pest Control</td>
<td>3</td>
</tr>
<tr>
<td>Option Requirement or Elective</td>
<td>12</td>
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</tbody>
</table>

**Floriculture Option.** Students in floriculture must take the above listed courses plus the...
following: Hort 134, 336, and 438. It is also recommended that they take Hort 416, 418; Mgt 201, B Law 210, and/or Ag Ec 335.

Nursery Management Option. Students in nursery management must take the above courses plus the following: Agron 301 or Hort 335, Agron 305, and Hort 416. It is also recommended that they take Mgt 201 and/or Ag Ec 335.

Courses printed in Roman types are required for graduation; those in italics are optional.

Preparation for Graduate Study
Students with undergraduate majors in the plant sciences, including horticulture, agronomy, plant pathology, environmental science, genetics, plant physiology and biochemistry may be well prepared for graduate study in horticulture.

Undergraduate students who are pursuing their studies at other institutions, or through other curricula at this institution, and who contemplate graduate work in horticulture, will do well to elect as many courses in the basic physical and biological sciences as possible.

Landscape Architecture
Landscape Architecture is the professional art and science of planning and designing the activities of people so that they are in harmony with the resources of the land. The practice ranges in scale from the design of residential and garden landscapes to planning and design of complex projects such as cities and regions.

The curriculum is accredited by the American Society of Landscape Architects (ASLA). It stresses a broadly based course of study emphasizing residential, community, and urban design; site, regional and land use planning, and professional practice methods.

The curriculum is divided into two parts: Pre-Landscape Architecture and Landscape Architecture. The opportunity exists to participate in special studies, professional work experiences and foreign study.

Description of Courses
For explanation see Index under "Symbols"

Landscape Architecture

L A

202 The Built Environment 3 Same as Arch 202.

260 History of Landscape Architecture 3

Historical developments in the practice and profession of landscape architecture throughout the world, circa B.C. to present.

262 Landscape Architectural Design I 3 (1-6) Prereq Arch 101, 102. Basic design and graphic techniques relating to solving of elementary design problems.

263 Landscape Architectural Design II 3 (1-6) Prereq L A 262. Techniques for visualizing and designing landforms; application to design process; construction principles applied to design projects.

264 Basic Landscape Design 3 For non-majors. Design theory and principles; site design factors; design process application; construction criteria; graphic communication; landform; circulation systems; plant uses.

361 Landscape Architectural Design III 4 (0-12) Prereq L. A. 263. Professional design problems, residential, urban, regional, and open space issues.

362 Plants and Landscape Architectural Design IV 3 (0-9) Prereq Hort 232, c/ in L. A. 361. Design projects; use of plant materials to solve spatial, horticultural, biological, aesthetic, and environmental problems. Field trip required.

363 Landscape Architecture Recreation Design V 3 (1-6) Prereq L. A. 361. Principles and techniques for recreation planning and design at varying scales.

365 Landscape Architectural Construction I 4 (0-12) Prereq L. A. 263. Earthwork computations; surface and subsurface drainage systems; horizontal and vertical vehicular circulation; parking layout; construction materials; details; intermediate grading design.

366 Landscape Architectural Construction II 4 (0-12) Prereq L. A. 365. Cost estimating; reference filing; construction materials and detail design; construction specifications; advanced grading design projects.

399 Professional Work Experience V 1-4 May be repeated for credit; cumulative maximum 8 hours. Prereq junior or senior in L. A. By interview only. Planned and supervised professional work experience in landscape architecture.

450 Principles and Practice of Planning 3 Same as R P 450.

466 Senior Seminar 1 May be repeated for
credit; cumulative maximum 2 hours. Prereq senior in L A. Topics of current or special interest in the profession.

467 Regional Landscape Inventory and Analysis 5 (1-12) Prereq Bio S 104; Soils 201 or Geol 101. Application of ecological planning process for landscape inventory and analysis. Credit not granted for both L A 467 and R P 567.

468 Advanced Projects in Planning and Design 5 (0-15) Prereq L A 467. Individual or group studio project in landscape architectural design or regional planning; exploring advanced techniques, methods and programming.

480 Professional Practice 1 Prereq senior in L A. Current business practices and project management techniques used in the profession.

492 Instructional Practicum in Landscape Architecture V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prereq junior or senior. By interview only.

499 Special Problems V 1-4 May be repeated for credit.

Schedule of Studies

Pre-Landscape Architecture

Pre-Landscape Architecture (PreLA) is a two-year, non-degree course of study that is intended to prepare undergraduate students for the advanced professional curriculum in the upper division. The PreLA curriculum concentrates on General University Requirements (GURs) and basic professional courses. The completion of PreLA prepares the student for the application to the professional major in landscape architecture or entry-level technical positions in various landscape industries. Transfer students who have not completed the equivalent of the PreLA course work will be accepted directly into PreLA.

Freshman Year

First Semester

Arch 101 Arch Graphics 3
Engl 101 Composition 3
Plant Science GUR 3-4
Humanities GUR 3
Social Science GUR 3

Second Semester

Arch 102 Arch Graphics 3
Science GUR 3-4
Physical Science GUR 3-4

Sophomore Year

First Semester

Hort 231 Plant Materials I 3
C E 101 Surveying 3
L A 262 Basic Design 3
Communications GUR 3
Social Science GUR 3

Second Semester

Hort 232 Plant Materials II 3
L A 263 L A Design 3
L A 260 L A History 3
Arch 355 L R Bldg Const 3
Soils 201 Soils 3

General University Requirement (GUR) courses should be selected with the assistance of a Landscape Architecture adviser.

Landscape Architecture

The professional four-year course of study is divided into two segments. These are Pre-Landscape Architecture (listed above) and the third- and fourth-year professional Landscape Architecture program (L A). Completion of the four-year program totaling 120 credits leads to the degree of Bachelor of Science in Landscape Architecture and allows the student to enter the profession. There are 40 upper-division credits required for graduation. At least three additional years of professional experience and successful completion of the landscape architectural license examination are necessary for registration as a licensed Landscape Architect in most states.

To be admitted to the major of L A, the student should have completed the PreLA curriculum and submitted an application. Application forms and instructions are available from the Admissions Office and the Department of Horticulture and Landscape Architecture Office. Applications to the professional program must be submitted prior to April 1. Due to limitations of space, faculty, and budget, admission can be granted to only the most qualified students based on experience, demonstrated abilities, motivation, and academic performance.

Transfer students who have completed the equivalent of the PreLA curriculum may apply to the professional program.

Junior Year

First Semester

L A 361 Site Planning 4
L A 362 Plant Design 3
L A 365 L A Construction
Emphasis Elective*

Second Semester
L A 363 L A Design V
L A 366 L A Construction
Ag M 346 Turf Irr Sys
Soils 315 Intro Air Photo
Emphasis Electives*

Hours
4
3
4
1
1
6

Senior Year
First Semester
L A 467 Land Inv Analysis
Soils 415 Terrain Analysis
L A 480 Prof Practice
Emphasis Electives*

Hours
5
3
1
6

Second Semester
L A 499
L A 468 Advanced Plan Design
L A 450 Prin Prac Planning
Electives

1
5
3
4

*Students are required to take 10 credit hours of elective course work beyond the above-listed core courses and the GURs that will provide them with an area of emphasis. The concentration in an area of emphasis is intended to give the student a more background in a particular area of interest as a complement to the core landscape architecture course work. Selection of appropriate emphasis electives will be made with the assistance of the faculty adviser.

Hotel and Restaurant Administration

PULLMAN CAMPUS

Acting Director, T. Umbrie; Associate Professor, D. M. Landadio; Lecturer, R. Howey.

This program provides specialized study of the major organizational and administrative problems of the hotel and restaurant industry. The program is intended to prepare graduates for the managerial opportunities available in the industry here and abroad. The curriculum provides for the well-rounded education of the hotel, restaurant, club, and institutional executive. It includes courses in the arts and sciences, economics, business administration, engineering, and foods, as well as in hotel and restaurant management. To be eligible for certification as a major in hotel and restaurant admin-

istration, students must have at least 40 semester hours credit and meet current cumulative g.p.a. and core business course g.p.a. standards. Current standards are published each fall in the Catalog Supplement. The course of study leads to the degree of Bachelor of Arts in Hotel and Restaurant Administra-

Description of Courses

For explanation see Index under "Symbols"

H A

181 Introduction 3 Historical development and organizational structure of the hospitality service industries.

235 Principles of Tourism 3 Underlying principles and practices in domestic tourism.

280 Lodging Systems and Procedures 3 Prereq H A 181; Acctg 230. Management functions relating to the planning and operational policies of various hotel departments.

310 Hospitality Industry Financial Control 3 Prereq Acctg 230, 231. Internal controls through financial and accounting systems for hotels and restaurants.

311 Law in Innkeeping 1 Prereq B Law 210. The case method is utilized in treating subjects such as innkeeper's lien, torts, and crimes against innkeepers.

320 Industry Experience 2 (0-6) Students work in hospitality industry; two supervised reports required.

350 Beverage Management 3 Not open to freshmen and sophomores. Beverage operations; detailed study of wines and spirits; consideration of social impacts such as trends in consumption.

356 Food and Beverage Systems Design and Analysis 3 Prereq H A 280. Management theory, problems, and cases in food and beverage operations; work methods; sanitation; research.

357 Food and Beverage Systems Control 3 Prereq H A 381. Problems encountered in the management of food and beverage operations such as control and forecasting.

381 Hospitality Management and Organization 3 Prereq H A 181. Advanced management methods and concepts utilized in the administration of hospitality service industries.

435 Tourism 3 International and domestic
tourism; effects of tourism on the society.

480 Marketing Strategy and Development 3 Prereq Mktg 360. Theory and practice; problems in guest relations, sales efforts, intramural promotion, research.

491 Operational Analysis 3 Prereq H A 357. Using management tools in analyzing operational effectiveness of hotel and restaurant organizations.

495 Case Studies and Research 3 Prereq H A 357. Use of the case method and computerized statistical programs in the analysis of administrative practices of organizations.

496 Seminar V 1-3 May be repeated for credit; cumulative maximum 6 hours. By interview only. Selected topics.

499 Special Problems V 1-4 May be repeated for credit.

Schedule of Studies

Pullman Campus

At least 40 of the total hours required for this degree must be in upper-division courses. More than 40 percent of the work must be in subjects other than business, economics, and hotel and restaurant administration.

Hotel and Restaurant Administration: H A 181, 280, 310, 320, 356, 357, 381, 491, 495; H A electives—6 hours.

General: HNF 120, F S 102.
Economics: Econ 102, 203, 350.
Economics courses that satisfy departmental requirements in Business may not be used to satisfy GURs.

Transfer Students

A student planning to transfer to hotel and restaurant administration from a two-year program should have made appropriate academic progress before transferring. In addition, the student should have 500 hours (one summer) of gainful employment in the hospitality industry. However, it is strongly advised that the student utilize both summers in related employment before entering WSU.

SEATTLE CAMPUS

Associate Professor and Director, H. A. Divine; Associate Professor, B. H. Booms; Assistant Professor, D. G. Rutherford.

WSU Seattle Center for Hotel and Restaurant Administration, 1108 E. Columbia, Seattle, Washington 98122 (Seattle University Campus).

This program is offered on the quarter system.

Students must have 90 quarter hours to enter the degree program, 85 of which are applicable toward graduation. Students who wish to enter the degree program may transfer the first two years' work from any accredited community college or four-year college. Persons in industry or other interested parties who wish to further their education but do not want to pursue a degree, are welcome to enroll in courses for a limited number of credits on a space available basis.

Description of Courses

For explanation see Index under "Symbols"

Credits are shown as quarter hours

HAS

201 Quantity Food Production 5 Principles of menu writing, sanitation and food preparation applied to management of quantity food production and service.
235 Principles of Tourism 5 Underlying principles and practices in domestic tourism.
270 Hospitality Facility Maintenance 2 Investigation of management problems associated with the physical plant.
285 Hotel Organization I 5 Introduction to hospitality industry; historical development of various types of food, lodging facilities; organization and functions of operating departments within hotels.
The case method is utilized in treating subjects such as innkeeper's lien, torts, and crimes against innkeeper.

315 Managerial Economics in Service Industries 5 Prereq Econ 102, 203. Economics of the firm; economic tools and formal decision making applied to cash flow, resource allocation, and cost minimization.

320 Industry Experience 3 Students work in hospitality industry; two supervised reports required.

355 Food and Beverage Management I 3 Prereq HAS 201. Management theory, problems, cases in food, beverage operations, work methods, primarily purchasing and menu planning.

356 Food and Beverage Management II 3 Prereq HAS 355. Management theory, problems and cases in food and beverage operations work methods, food facility design and sanitation safety.

357 Food and Beverage Management III 5 Prereq HAS 310, 356. Problems encountered in the management of food and beverage operations, such as dealing with control and forecasting.

370 Building and Maintenance Management 3 Prereq HAS 270. Problems involved with the supervision of maintenance personnel and direction of the maintenance program.

375 Club Management 5 Prereq junior standing. The identification of managerial problems unique to club operations and their potential solutions.

381 Hotel Organization III 5 Prereq HAS 285. Advanced management methods and concepts utilized in the administration of hospitality service industries.

385 Applied Personnel Management 3 Functional areas of personnel planning, selection, training, evaluation and wage and salary administration related to the hospitality industry.

386 Applied Industrial Relations 3 Labor relations; history, organization, and elections of bargaining agents, negotiation and administration of contracts.

387 Tourism 5 International and domestic tourism; effects of tourism on the society.

478 Research in Hospitality Industry 5 Prereq QMeth 215; Cpt S 220. Utilizing statistical analysis in strategy formulation.

480 Service Sector Marketing 5 Theory and practice; problems in guest relations, special sales efforts, intramural promotion, research.

491 Operational Analysis 3 Prereq HAS 310, 357. Using management tools in analyzing operational effectiveness of hotel and restaurant organization.

494 Service Operations Management 5 Design and management of service delivery systems through operations management topics from a service perspective.

495 Hotel Management Seminar 5 Prereq HAS 381. Use of the case method and computerized statistical programs in the analysis of administrative practices of organizations.

499 Special Problems V 1-5 May be repeated for credit.

Schedule of Studies

Seattle Campus

The Bachelor of Arts degree in Hotel and Restaurant Administration requires a total of 180 quarter hours. At least 60 of the total hours required for this degree must be in upper-division courses. For general courses and core courses, see Business section.

Hotel and Restaurant Administration Requirements

HAS 101, 201, 270, 285, 310, 315, 320, 355, 356, 357, 370, 381, 480, 491, 494, 495; HAS electives 18 hours.

Department of Human Nutrition and Foods

Professor and Department Head, D. C. Fletcher; Associate Professors, K. Funk, G. Jennings, M. Mitchell, G. Scheier; Assistant Professors, E. Augustin, L. Massey, C. McCartan, T. Mehta; Clinical Instructors, S. Scheunemann, M. Stevens.

The curriculum is designed to prepare students for the profession of dietetics, positions as home economists in food-related organizations and for research and graduate study.

Six options of study are offered to men and
women interested in careers related to food, nutrition and foodservice management. Students enrolled in these options complete prescribed courses of study leading to the degree of Bachelor of Science in Home Economics.

The Food-Related Business Option is for those interested in combining a career in business with foods. Courses in foods and nutrition, based on a foundation of chemistry and human physiology, are supplemented with appropriate business administration courses to prepare the graduate for entry-level positions in the test kitchens of food processors, as representatives of equipment or utility companies, or with other food-related organizations such as advertising agencies and in federal and local government programs.

The Food-Related Communications Option provides students with the opportunity to develop communication skills while studying the prescribed courses in foods and nutrition which are based on a foundation of chemistry and human physiology. Employment opportunities may be found in industry or government organizations engaged in the dissemination of food and nutrition information to the public.

The students enrolled in the Food-Related Communications Option may, by careful course selection, fulfill the requirements for a minor in communications. The minor will strengthen the student's communication skills and enhance job opportunities.

Practicum experiences are available to students enrolled in the above options. For this experience, the student learns on-the-job for one semester or during the summer. Practicum experiences are arranged to match the career goals of the student.

Three options for studying dietetics are available.

General Dietetics is the "traditional" option in dietetics and has been available since the 1940's. By following the prescribed course of study of foods, nutrition and foodservice management based on chemistry, biochemistry, physiology and business the student fulfills the minimum academic requirements of The American Dietetic Association as well as those of the department and university. The student must gain additional clinical experience or training through a dietetic internship before becoming eligible for membership in The American Dietetic Association. Internships in hospitals or selected organizations are very competitive and are available mostly in the midwest and eastern part of the United States. Those completing the program of study for a Bachelor of Science degree and an internship are qualified for a variety of positions as a member of the management team and/or health care team in hospitals; school, college, and university food service; restaurants and in government and private agencies.

Completion of the Foodservice Management Option fulfills minimum academic requirements for membership in The American Dietetic Association, as well as those required by the department and university. Course work in chemistry, physiology, nutrition, foods, business and food service management are required. The student may become a member of The American Dietetic Association by completing an administrative internship. This person is then eligible for administrative positions in hospitals, school, college, and university food service; restaurants as well as government and private agencies. These persons are not qualified to work in diet therapy or nutrition education positions.

The Coordinated Undergraduate Option in General Dietetics combines classroom education with clinical experiences in dietetics. Course work is similar to that described for general dietetics. In this four-year option, the student completes the academic requirements for the department and university as well as the eligibility requirements for membership in The American Dietetic Association and for taking the examination to become a Registered Dietitian. Graduates of this option qualify for the same kinds of positions as do the graduates of the General Dietetics Option who complete a postbaccalaureate internship.

To become a Registered Dietitian it is necessary to complete one of the dietetic options and an internship for the General Dietetic and the Foodservice Management options. No internship is necessary after completing the Coordinated Undergraduate Option in General Dietetics. It is necessary to pass a registration examination which is given twice each year under the auspices of The Commission on Dietetic Registration. The dietitian meeting qualifications for registration is eligible to use the designation "R.D."

The sixth option in the department is the Research Option. The Research Option requires more science courses than the above options. Physics and biology, in addition to courses in chemistry, biochemistry, physiology, foods and nutrition, are required. Students may participate in research projects conducted by the faculty. This experience provides a general understanding of career possibilities and allows students to share in research accomplishments. Those persons graduating in the Re-
search Option may obtain jobs in quality control or test kitchens in the food industry. The graduate of this option may become a laboratory technician. However, to become a leader in a research project, an advanced degree is usually required. The Research Option is excellent preparation for graduate study.

The department offers minors in Food and Nutrition, and Foodservice Management.

The department also offers courses of study leading to the degree of Master of Science in Home Economics. An accelerated program to obtain both a Bachelor of Science and a Master of Science degree in a five-year period is also offered. The department participates in interdisciplinary programs in food science and nutrition leading to the degrees of Master of Science in Food Science, Master of Science in Nutrition, and Doctor of Philosophy (Food Science, Nutrition).

**Description of Courses**

For explanation see Index under "Symbols"

**Human Nutrition and Foods**

**HNF**

120 Food Preparation 3 (2-3) Principles and methods of preparation, qualities, composition and uses of foods. Credit not granted for both HNF 120 and 220.

130 [Z] Nutrition for Man 3 Nutrition principles and applications to nutrient needs at all age levels; psychological, economic, and cultural implications of food. Credit not granted for both HNF 130 and 253.

220 Food Preparation 3 (2-3) Prereq Chem 240. Application of scientific principles in the use and preparation of selected standard quality food products.

230 Foods and Cultures of African Peoples 3 Impact of foods and cultures of African peoples on ethnic groups throughout the world.

233 Human Nutrition 3 Prereq one course in Chem. Principles of human nutrition applicable to all ages of human development; impact of environment, economics, culture on food and nutrition. Credit not granted for both HNF 130 and 253.

266 Management of Home Equipment 3 (2-3) Management of equipment and utilities used in the home.

270 Food Selection and Appraisal 2 Same as F S 270.

280 Quantity Food Production 3 Prereq HNF 120 or 220. Principles of menu writing, sanitation and food preparation applied to management of quantity food production and service.

281 Quantity Food Production Laboratory I 2 (0-6) Prereq HNF 120 or 220. Recipe adjustment and costing; preparing and serving food in quantity.

282 Quantity Food Production Laboratory II 1 (0-3) Prereq HNF 120 or 220. By interview only. Recipe adjustment and costing; preparing and serving food in quantity.


334 Family Food Management 3 (2-3) Prereq HNF 120 or 220; a course in nutrition. Selection, purchase, preparation, and serving foods; nutritional needs, life styles, and income levels.

350 Dynamics of Dietetics 2 (1-3) Prereq major in HNF; c/ in HNF 475 for CUOGD students. Dynamics of nutritional care and foodservice management in health and disease.

381 Quantity Food Purchasing 2 Prereq HNF 280; HNF 281 or 282. Purchasing process; specifications, receiving, storage, and inventory control.

420 Comparative Foods 2 Prereq Chem 240. Experimental foods taught by means of demonstrations; chemical and physical principles in the preparation of foods.

421 Comparative Foods Laboratory 1 (0-3) May be repeated for credit; cumulative maximum 2 hours. Prereq HNF 420. Studies of food products reported through research paper or public demonstration.

431 Prenatal, Infant and Child Nutrition 2 Prereq HNF 333 or c/. Nutrition of the mother and fetus during pregnancy and of the child from infancy to adolescence. (a/y)

434 Human Nutrition, Intermediary Metabolism 3 Prereq BC/BP 364; Zool 251. Biochemical roles of nutrients and processes of intermediary metabolism affecting man's need for food; recommended dietary allowances; national nutritional problems.

435 Diet Therapy 3 (2-3) Prereq HNF 434 or c/. Nutrition principles applied to pathological conditions in man.
Nutrition Education 3 Prereq HNF 333. Individual and group nutrition education programs; methods, resources, settings, and community structures for guiding change in nutritional behavior.

Readings in Foods and Food Systems Management 2 Prereq HNF 480 or c/. Reports, discussions and reviews of recent scientific literature and developments in foods and food systems management. Credit not granted for both HNF 438 and 538.

Current Topics in Nutrition 2 Prereq HNF 434. Analysis of scientific, popular and legislative articles pertaining to topics of current interest in nutrition. Credit not granted for both HNF 439 and 539.

Clinical Dietetics 3 By interview only. Advanced nutrition principles applied to pathological conditions in humans and principles of participation in delivery of nutritional care.

Clinical Experience in Dietetics V 1-5 May be repeated for credit; cumulative maximum 20 hours. By interview only. Students in CUOGD receive clinical experience each semester during their junior and senior years.

Organization and Management of Food Service Systems 3 Prereq HNF 280; for seniors only. Organization and management principles as applied to food.

Dietetics/Management Practicum V 3 (1-6) to 6 (1-15) May be repeated for credit; cumulative maximum 6 hours. Prereq senior in HNF. Application of theory in assessing, implementing, and evaluating dietary and management practices. Credit not granted for both HNF 481 and 498.

Equipment for Food Service Systems 3 Prereq HNF 280, 281 or 282. Materials, specifications, operations and use, maintenance schedules of kitchen equipment; dining room facilities and equipment flow. (a/y)

Computer-Assisted Dietary Management 3 Prereq HNF 480 or c/. Use of computer programs to aid management in inventory control, production, food cost accounting and patient nutrient analysis.

Clinical Experience in Food Service Systems 3 (1-6) By interview only. Experience in food systems management in clinical settings.

Food Practicum V 1 (0-3) to 8 (0-24) May be repeated for credit; cumulative maximum 8 hours. Not open to freshmen and sophomores. Supervised experiences of working in one or more food related businesses, organizations, and agencies. Credit not granted for both HNF 481 and 498.

Advanced Human Nutrition I 3 Prereq HNF 434. Experimental basis for human nutritional requirements and determination of nutritional status.

Advanced Human Nutrition II 3 Prereq HNF 503. Metabolic responses to foods with emphasis on neural and hormonal responses; interaction of nutrients at the whole body level.

Research Techniques in Nutrition 3 (1-6) Prereq 6 hrs nutrition. Methods of conducting field, applied and metabolic studies in human nutrition.

Food Quality Evaluation 3 (2-3) Prereq senior or graduate in HNF or F S. Techniques in evaluation of quality of foods by sensory or instrumental methods. (a/y)

Changing Food Patterns 2 or 3 Prereq HNF 334; 8 hrs social science; Zool 231 or Chem 240. Interrelationships of food behavior and nutrition; implications for teaching and development of instructional plans.

Community Nutrition 3 Prereq adv nutrition. By interview only. Analysis and evaluation of community nutrition programs—planning, surveillance and intervention; community resources, agencies, and institutions for nutrition.

International Nutrition 3 Prereq advanced nutrition course. World nutrition, cultural, and economic problems relating to meeting nutritional needs.

Nutrition and Aging 2 or 3 Prereq advanced nutrition course. By interview only. Assessment, evaluation, and treatment of nutritional problems of the aged.

Human Digestion and Absorption 3 Prereq BC/BP 364; HNF 434. Pathological biochemistry, anatomy, and physiology of digestion and absorption in human gut.

Pathophysiology of Human Nutrition 3 Prereq Zool 353; BC/BP 364; HNF 435. Protein, fat, carbohydrate and other nutrient pathophysiology in the human.

Nutrition Program Theory and Practice 3 (2-3) Prereq HNF 436. Societal and behavioral determinants of food habits;
Department of Human Nutrition and Foods

application and implementation of planning and evaluation principles to nutrition education programs.

538 Readings in Foods and Food Systems Management 2 Graduate level counterpart of HLF 438; additional requirements. Credit not granted for both HLF 438 and 538.

539 Current Topics in Nutrition 2 Graduate level counterpart of HLF 439; additional requirements. Credit not granted for both HLF 439 and 539.

Problems, Research, and Thesis

HNF 499 Special Problems V 1-4 May be repeated for credit.

598 Foods/Nutrition Practicum V 1 (0-3) to 4(0-12) May be repeated for credit; cumulative maximum 4 hours. By interview only. Professional level supervised field experience in food and/or nutrition.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit. (For master's in H E or nutrition only.)

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit. (For PhD in nutrition only.)

Schedule of Studies

The Bachelor of Science in Home Economics requires a total of 120 semester hours. At least 40 of the total hours required for the Bachelor of Science degree must be in upper-division courses.

All students in the major are required to take General University Requirements, Department Core Courses, and the courses listed for the specific option. First semester freshmen should enroll in chemistry (see specific option).

A. General University Requirements

<table>
<thead>
<tr>
<th>Hours</th>
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<tbody>
<tr>
<td>Arts and Humanities</td>
</tr>
<tr>
<td>Social Sciences</td>
</tr>
<tr>
<td>Anth 101 or 203</td>
</tr>
<tr>
<td>Econ 201 Principles</td>
</tr>
<tr>
<td>Psych 101, 102 and/or Soc 101*</td>
</tr>
<tr>
<td>Communications Proficiency</td>
</tr>
<tr>
<td>Engl 101 Composition</td>
</tr>
<tr>
<td>Sciences</td>
</tr>
<tr>
<td>Chemistry*</td>
</tr>
<tr>
<td>Zool 251 Human Physiology</td>
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</tbody>
</table>

*See specific options

B. Department Core Courses

<table>
<thead>
<tr>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Chem 240 Elem Organic Chem</td>
</tr>
<tr>
<td>HNF 233 Human Nutrition</td>
</tr>
<tr>
<td>HNF 220 Food Prep</td>
</tr>
<tr>
<td>HNF 280 Quan Ed Prod</td>
</tr>
<tr>
<td>HNF 281 or 282 Quant Lab</td>
</tr>
<tr>
<td>HNF 333 Nutr Hum Life Cycle</td>
</tr>
<tr>
<td>HNF 334 Fam Food Mgt</td>
</tr>
</tbody>
</table>

C. Department Options

1. Food-Related Business Option

<table>
<thead>
<tr>
<th>Hours</th>
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<tbody>
<tr>
<td>Chem 101, 102 Introductory</td>
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<tr>
<td>Bact 101 Elem Bact</td>
</tr>
<tr>
<td>Soc 101, Psych 101 or Psych 102</td>
</tr>
<tr>
<td>Spe 102 Pub Speaking</td>
</tr>
<tr>
<td>HNF 266 Mgmt Home Eq</td>
</tr>
<tr>
<td>HNF 270 Food Sec &amp; App</td>
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<tr>
<td>HNF 420 Comp Foods</td>
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<tr>
<td>HNF 438 Readings</td>
</tr>
<tr>
<td>HNF 498 Food Practicum</td>
</tr>
<tr>
<td>F S Products Courses</td>
</tr>
<tr>
<td>Mgt 301 Mgmt &amp; Org</td>
</tr>
<tr>
<td>Mktg 360 Marketing</td>
</tr>
<tr>
<td>Spe 301, Ag 205, or Spe 235</td>
</tr>
<tr>
<td>CFS 333 Fam as Consumers</td>
</tr>
<tr>
<td>Mktg 367 or CFS 350</td>
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<tr>
<td>Soc 373 Mass Comm</td>
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<tr>
<td>Jour 225 or Engl 402</td>
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</tbody>
</table>

Plus a minimum of 15 credits selected from: ACE 301, 401; B Law 210; Accctg 230; Mgt 401; Adver 280; P R 413; Educ 301, 445; HNF 421, 434, 436, 438, 498, 522; Psych 306; Soc 351; statistics or computer science.

2. Food-Related Communications Option or Minor

<table>
<thead>
<tr>
<th>Hours</th>
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<tbody>
<tr>
<td>Chem 101, 102</td>
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<tr>
<td>Bact 101 Elem Bact</td>
</tr>
<tr>
<td>Psych 101 or Soc 101</td>
</tr>
<tr>
<td>F S Products Courses</td>
</tr>
<tr>
<td>Mktg 360 Marketing</td>
</tr>
<tr>
<td>Mktg 367 or CFS 350</td>
</tr>
<tr>
<td>Com 225 Newswriting</td>
</tr>
<tr>
<td>Com 235 Reporting</td>
</tr>
<tr>
<td>Com 250 Intro Broadcasting</td>
</tr>
<tr>
<td>Com 280 Adver Prin &amp; Pract</td>
</tr>
<tr>
<td>Com 312 Public Relations</td>
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<tr>
<td>Com 330 News Editing</td>
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</tbody>
</table>
### 3. General Dietetics Option

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 105, 106</td>
<td>8</td>
</tr>
<tr>
<td>Bact 101 Elem Bact</td>
<td>4</td>
</tr>
<tr>
<td>Psych 101 or Soc 101</td>
<td>3</td>
</tr>
<tr>
<td>Math 101 Inter Alg⁺</td>
<td>3</td>
</tr>
<tr>
<td>BC/BP 364, 366</td>
<td>4</td>
</tr>
<tr>
<td>Mgt 301 or Psych 306</td>
<td>3</td>
</tr>
<tr>
<td>HNF 270 Food Sel &amp; App</td>
<td>2</td>
</tr>
<tr>
<td>HNF 381 Quant Fd Purch</td>
<td>2</td>
</tr>
<tr>
<td>HNF 420 Comp Foods</td>
<td>2</td>
</tr>
<tr>
<td>HNF 434 Hum Nutr</td>
<td>3</td>
</tr>
<tr>
<td>HNF 435 Diet Therapy</td>
<td>3</td>
</tr>
<tr>
<td>HNF 436 or Educ 301</td>
<td>3-4</td>
</tr>
<tr>
<td>HNF 438 or 459</td>
<td>2</td>
</tr>
<tr>
<td>HNF 480 Mgmt Fd Sys</td>
<td>3</td>
</tr>
<tr>
<td>HNF 481 Dietetics/Mgmt</td>
<td>3-6</td>
</tr>
<tr>
<td>HNF 484 Cpt Diet Mgmt</td>
<td>3</td>
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</tbody>
</table>

### 4. Foodservice Management Option

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Chem 101, 102</td>
<td>8</td>
</tr>
<tr>
<td>Bact 101 Elem Bact</td>
<td>4</td>
</tr>
<tr>
<td>Psych 101 Introduction</td>
<td>3</td>
</tr>
<tr>
<td>Soc 101 Introduction</td>
<td>3</td>
</tr>
<tr>
<td>Math 101 Inter Alg⁺</td>
<td>3</td>
</tr>
<tr>
<td>B Law 210 Law &amp; Business</td>
<td>3</td>
</tr>
<tr>
<td>Accrg 230 Accounting</td>
<td>5</td>
</tr>
<tr>
<td>Mgr 301</td>
<td>3</td>
</tr>
<tr>
<td>Econ 350 Labor Econ</td>
<td>3</td>
</tr>
<tr>
<td>Cpt S 150, 153 or 154, or 405</td>
<td>3</td>
</tr>
<tr>
<td>HNF 270 Food Sel &amp; App</td>
<td>2</td>
</tr>
<tr>
<td>HNF 381 Quant Fd Purch</td>
<td>2</td>
</tr>
<tr>
<td>HNF 420, 421</td>
<td>3</td>
</tr>
<tr>
<td>HNF 436 or Educ 301</td>
<td>3-4</td>
</tr>
<tr>
<td>HNF 438 Readings</td>
<td>2</td>
</tr>
<tr>
<td>HNF 480 Mgmt Fd Sys</td>
<td>3</td>
</tr>
<tr>
<td>HNF 481 Dietetics/Mgmt</td>
<td>3-6</td>
</tr>
<tr>
<td>HNF 482 Equipment</td>
<td>3</td>
</tr>
<tr>
<td>HNF 484 Cpt Diet Mgmt</td>
<td>3</td>
</tr>
</tbody>
</table>

### 6. Research Option

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem 105, 106</td>
<td>8</td>
</tr>
<tr>
<td>Bio S 102 Intro Biol</td>
<td>4</td>
</tr>
<tr>
<td>Bact 201 Gen Micro</td>
<td>5</td>
</tr>
<tr>
<td>Psych 101 or 102 or Soc 101</td>
<td>3</td>
</tr>
<tr>
<td>Math 140, 141</td>
<td>8</td>
</tr>
<tr>
<td>Chem 217 Quant Anal</td>
<td>4</td>
</tr>
<tr>
<td>BC/BP 364, 366</td>
<td>4</td>
</tr>
<tr>
<td>Phys 101, 102</td>
<td>8</td>
</tr>
<tr>
<td>Biom 412 Statistics</td>
<td>3</td>
</tr>
<tr>
<td>HNF 270 Food Sel &amp; App</td>
<td>2</td>
</tr>
<tr>
<td>HNF 420, 421</td>
<td>3</td>
</tr>
<tr>
<td>HNF 434 Hum Nutr</td>
<td>3</td>
</tr>
<tr>
<td>HNF 438 or 439</td>
<td>2</td>
</tr>
</tbody>
</table>

*An elective course may be substituted if the Mathematics Achievement Score on Washington Pre-College Test is greater than 56.

### Transfer Students

Transfer not later than the second semester of the sophomore year is recommended to allow scheduling of major courses in proper sequence. However, additional semesters may be necessary to complete required courses.

### Preparation for Graduate Study

Normally the applicant should have an undergraduate major in foods, nutrition or food service management. However, candidates with a good record in related fields may be well prepared for certain areas of advanced study. Students from related disciplines would be required to take certain courses required of undergraduate majors in these fields.

Students who identify an interest in graduate work early in their studies are encouraged...
to participate in an accelerated course of study in which both a B.S. and M.S. can be earned in five years. A student should contact the adviser no later than the end of the junior year so a course of study can be planned which schedules appropriate prerequisites to graduate courses and an introduction to research projects.

Humanities Courses

The Humanities curriculum consists of a series of interdisciplinary courses designed to introduce students to some of the basic concepts of civilization through the study of representative masterpieces of literature, music, art and related fields. The courses numbered 101, 202 and 204 provide a survey of Western Civilization from ancient times to the twentieth century.

Description of Courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>[H] Mythology 2 Graeco-Roman myths and their influence on art, literature, and music.</td>
</tr>
<tr>
<td>101</td>
<td>[H] Humanities in the Ancient World 3 Integrated humanities: literature, philosophy, history, and art of the Ancient World.</td>
</tr>
<tr>
<td>202</td>
<td>[H] Humanities in the Middle Ages and Renaissance 3 Integrated humanities: exploring ideals of humanism in literature, philosophy, history, art, and music of the Middle Ages and Renaissance.</td>
</tr>
<tr>
<td>204</td>
<td>[H] Humanities from the Enlightenment to World War I 3 Integrated humanities: literature, philosophy, history, art, and music of the Modern World.</td>
</tr>
<tr>
<td>301</td>
<td>[H] Greek and Roman Drama 2</td>
</tr>
<tr>
<td>310</td>
<td>[H] Eastern Civilization and Literature 3 Same as For L 310.</td>
</tr>
<tr>
<td>499</td>
<td>Special Problems V 1-4 May be repeated for credit.</td>
</tr>
</tbody>
</table>

Program in Literary Studies

Offered jointly by the Department of English and the Department of Foreign Languages and Literatures, the program in Literary Studies is designed to give the student an appreciation of literature as a phenomenon both transcending and subject to national and linguistic boundaries. The doctoral degree to which the program leads is conceived of—due allowance being made for the fact that knowledge of one's native language is likely to remain supreme—as requiring equal proficiency in English and its literature and one foreign language and its literature, accompanied by a lesser degree of proficiency in a second foreign language and its literature. At times the student may be advised to enroll in appropriate courses offered by other departments, such as History, Philosophy, or Speech. Students will also be expected to acquaint themselves with a selected group of the world's classics which fall outside their chosen area of study.

Thus the Program in Literary Studies is designed to encourage the breadth of understanding which an acquaintance with literature at large, as well as a detailed knowledge of several specific literatures, should afford. Its purpose is to graduate well-rounded, mature, and creative scholars equipped to teach in departments of English, foreign languages, or comparative literature, and ready to participate in general programs in the humanities. Graduates of the program should be well prepared also for responsible positions in university or research libraries. A complete description of the program will be found in the Graduate Study Bulletin of Washington State University.

Department of Materials Science and Engineering

Professor and Department Head, D. B. Mason; Professors, S. A. Duran, T. M. Maloney, R. V. Subramanian; Adjunct Professors, S. H. Bush, L. C. Olsen; Associate Professors, B. L. Farmer, W. E. Johns, R. F. Pellerin; Adjunct Associate Professors, J. J. Laidler, J. L. Straatsma; Assistant Professor, S. O. Nelson; Adjunct Assistant Professor, W. J. Mills; Adjunct Lecturers, D. E. Mahagin, R. D. Nelson.

Materials Science and Engineering is the application of methods and principles of the pure sciences to the study and utilization of engineering materials. In this application of science, the relationship between internal structure and useful properties is of primary importance, although other characteristics of solids contribute to material properties in important ways.
The specific fields of application covered by research and instructional programs can be expressed by the nominal designations of metals (metallurgy), polymers, ceramics, wood, and composites. For purposes of analysis, study in these disciplines may be placed on a generalized basis by dividing them into the following areas of materials science: (1) structural nature of materials, (2) thermodynamics and phase equilibrium, (3) phase transformations in materials, (4) mechanical properties of materials, (5) physical properties of materials, and (6) chemical properties of materials. Because of the diversity of useful properties encountered in materials engineering, attention must also be given to the application and peculiarities of specific materials types. Where possible, however, a generalized approach toward the study of materials, their properties, their selection, and their utilization is fostered.

The department offers courses leading to the degrees of Bachelor of Science in Physical Metallurgy and Master of Science in Materials Science and Engineering. The department participates in the interdepartmental program in engineering science leading to the degree of Doctor of Philosophy.

**Description of Courses**

**For explanation see Index under "Symbols"**

**MSE**

**101** [P] Introduction to Materials Science 3 (2-3) Metals, plastics, ceramics, wood, and bone.


**110** Metallurgy 2 For freshmen only. Materials science and engineering, metallurgy; elements of physical metallurgy.

**220** Metallography 3 (0-9) Principles and techniques of optical metallography and other laboratory methods used in modern physical metallurgy.

**301** Materials Science 3 Prereq Chem 105; Math 172; Phys 202. Structure of materials, phase equilibrium, phase transformations, and mechanical properties.

**302** Materials Science 3 Prereq Chem 105; Math 172; Phys 202. Structure of materials, phase equilibrium, transformations; electronic structure of solids; thermal, electrical, and magnetic properties of materials; semiconductors, dielectrics.

**331** Process Metallurgy 3 Prereq Chem 105; Phys 201 or c//. Mineral preparation, steel making, extraction and refining of selected metals; casting, working, machining, welding; powder metallurgy; heat treatment of metals.

**401** (332) Metallic Materials 3 Prereq MSE 301. Physical metallurgy of engineering metals and their alloys.

**402** Polymeric Materials 3 Prereq MSE 301 or junior in Engr or Ph S. Structural characterization, syntheses, and reactions of polymeric materials; relationships between structure and properties, viscoelasticity, deformation, and physical behavior of polymers.

**403** Ceramic Materials 3 Prereq MSE 301. Processing, characteristics, microstructure, and properties of ceramic materials. (a/y)

**412** (414) Thermodynamics and Phase Equilibrium 3 Prereq c/ in MSE 301; Phys 202. Concepts of activity, equilibrium, solution properties; relationship between free energy, composition, and temperature; heterogeneous equilibria.

**413** Mechanics of Solids 3 Prereq C E 314; MSE 301. Elasticity, elastic stress distributions; plastic deformation of single and polycrystals; introduction to dislocation theory and its applications; creep, fracture, fatigue. (a/y)

**414** Equilibrium Diagrams 2 Prereq MSE 301, 412. Interpretation of equilibrium diagrams; ternary systems, pressure-temperature relationships. (a/y)

**415** Physical Properties 3 Prereq MSE 301. Introduction to electron theory and lattice vibration theory of solids; applications to thermal, electrical, and magnetic properties of solids. (a/y)

**416** Phase Transformations 3 Prereq MSE 301, 421, 412. Thermodynamics of solid phase; mechanisms and kinetics of diffusion; nucleation and growth; recrystallization; boundary migration; eutectoid and martensitic transformations.

**418** Chemical Properties 3 Prereq MSE 301, 412. Thermodynamics and kinetics of heterogeneous chemical reactions at metallic surfaces; oxidation and other gas-metal reactions; electrolysis; corrosion. (a/y)

**421** X-ray Diffraction 3 Prereq Phys 202. Properties of x-rays, scattering and diffraction; space lattices and groups; projections, diffraction methods; structure determination; x-ray spectroscopy.

237
X-ray Diffraction Laboratory 1 (0-3)
Prereq c/c in MSE 421. X-ray diffraction techniques; interpretation of diffraction data from single crystals and polycrystals.

Physical Metallurgy Laboratory 2 (0-6)
Prereq c/c in MSE 416. Selected experimental work in physical metallurgy.

Physical Metallurgy Laboratory 2 (0-6)
Prereq MSE 425. Selected experimental work in physical metallurgy.

Seminar 1 May be repeated for credit.
For seniors only.

Special Problems V 1-4 May be repeated for credit.

Advanced Topics in Materials Science 1-3 May be repeated for credit; cumulative maximum 6 hours. Chemical crystallography, microstructure, 1trastructure, theories of crystalline and non-crystalline solids, rheology and fracture mechanism of materials.

Advanced Topics in Materials Engineering 1-3 May be repeated for credit; cumulative maximum 6 hours.

Fundamentals of Research 2 Development of research projects, research plans, oral presentations, publications. Cooperative course taught at the University of Idaho.

Deformation and Fracture 3 Prereq MSE 301; MSE 413 or E 314. Elementary dislocation theory and its applications to some important deformation and fracture processes.

Thermodynamics of Solids 3 Prereq MSE 414 or 400-level thermo. Thermodynamic properties of solid solutions; models for substitutional and interstitial solutions; configurational and nonconfigurational contributions; calculation of phase diagrams. (a/y)

Phase Transformations 3 Prereq MSE 301, 414, 416. Thermodynamics, nucleation, interface motion, mechanisms and kinetics of solid state reactions; thermal activation; athermal kinetics; diffusion, interface phenomena. (a/y)

Seminar in Materials Science and Engineering 1 May be repeated for credit; cumulative maximum 3 hours. Prereq graduate student in MSE. Reporting problems, research and research methods in materials science and engineering.

Advanced Topics Laboratory 1 or 2 May be repeated for credit; cumulative maximum 4 hours. Advanced topics laboratory; electron diffraction, microscopy, rheology and other laboratory techniques.

Fracture in Solids 3 Prereq MSE 413 or E 314. Fracture initiation and propagation in metals, ceramics, polymers, wood, and composites; effect of environment; relationship to microstructure.

High-Temperature Phenomena in Solids 3 Prereq MSE 416 or 1 sem chem thermo; MSE 511. Kinetics and mechanisms of diffusion in solids; high-temperature deformation; oxidation. (a/y)

Natural and Synthetic Polymeric Materials 3 Prereq MSE 402. Glassy, crystalline, and rubbery states of synthetic and natural polymers.

Advanced Wood Science 3 Prereq MSE 402; Org Chem. Physical, electrical, mechanical, and chemical properties of wood. (a/y)

Basic Principles of Adhesion 3 Prereq MSE 402. Principles of interfacial bonding applied in the engineering of polymers, wood and heterophase systems.

Reinforced Polymer and Wood Based Composites 3 Fundamentals of composite materials having polymers and wood as major components.

Nondestructive Testing of Wood-Based Materials 3 Principles of nondestructive testing applied to wood-based materials.


Special Projects or Independent Study Variable credit.

Master's Research, Thesis, and/or Examination Variable credit.

Master's Special Problems, Directed Study, and/or Examination Variable credit.

Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies

Physical Metallurgy

Metallurgy is the study and utilization of metals as engineering materials. Physical metallurgy deals primarily with the nature and properties of metals and alloys as they are used, rather than with their extraction from ores. In the undergraduate program the student is introduced to physical metallurgy through the broad concepts of materials science. This in-
volves a study of the mechanical, chemical, and physical properties of metals, their crystal structure, their equilibrium behavior, and their utilization in engineering practice. Graduate studies provide the opportunity for pursuing original investigations in any of these fields. The curriculum in physical metallurgy in the College of Engineering is accredited by the Accreditation Board for Engineering and Technology. At least 45 of the total hours required for the bachelor's degree in this program must be in upper-division courses; at least three hours of the total 18 hours of social science and humanities must be at the introductory level. A total of 122 semester hours are needed for the course work required for graduation in this program.

**Freshman Year**

**First Semester**
- Math 171 Calculus I 4
- Chem 105 or 111 4
- MSE 110 Metallurgy 2
- Com Prof Elective 3
- Hum or Soc S Elective 3

**Second Semester**
- Math 172 Calculus II 4
- Math 220 Linear Algebra 2
- Chem 106 or 212 4
- Com Prof Elective 3
- Bio S Elective 3

**Sophomore Year**

**First Semester**
- Math 273 Calculus III 2
- Phys 201 Engineering 4
- MSE 331 Process Met 3
- Cpt S 203 Comp Prog Engr 2
- Econ 102 Fundamentals 3
- Hum Elective 3

**Second Semester**
- Math 315 Diff Equat 3
- Phys 202 Engineering 4
- C E 211 Statics 3
- MSE 220 Metallurgy 3
- Hum or Soc S Elective 3

**Junior Year**

**First Semester**
- M E 301 Thermo 3
- C E 314 Mech of Mat 3
- MSE 301 Materials Science 3
- MSE 412 Thermo Phase 3
- Hum or Soc S Elective 3

**Second Semester**
- MSE 401 Metallic Mat 3
- MSE 414 Equil Diagram 2
- MSE 418 Chem Prop 3
- MSE 421 X-Ray Diffrac 3
- MSE 423 X-Ray Diffrac Lab 1
- Technical Elective* 3

**Senior Year**

**First Semester**
- MSE 416 Phase Transf 3
- MSE 425 Phys Met Lab 2
- MSE 450 Seminar 1
- Technical Elective* 3
- MSE 402 Polymer Matl 3
- Hum or Soc S Elective 3

**Second Semester**
- MSE 403 Ceramic Materials 3
- MSE 413 Mech of Solids 3
- MSE 415 Phys Properties 3
- MSE 426 Phys Met Lab 2
- MSE 450 Seminar 1
- Technical Elective* 3

*Technical electives may be chosen from the following courses: E E 214, 261, 262, 301, 302, 306, 307, 311, 496; M E 303, 404; C E 315; Ch E 414, 416; Mgrt 340, 440, QMeth 215; Chem 331, 332, 420, 423; Phys 303, 304, 410; Math 340, 440, 441; Cpt S 215, 310; Stat 430.

**Transfer Students**

Students planning to transfer to Washington State University should note the sequence of courses required for the bachelor's degree and the alternate year offerings of second-semester junior/senior courses. Transfers from community colleges should plan to enroll in MSE 220 and 331 during their junior year at Washington State University. To allow such a modification of the schedule, they should transfer six additional semester hours of humanities or social science electives to meet the additional College of Engineering requirement (beyond the GUR) in those subjects.

**Preparation for Graduate Study**

**Metals and Ceramics:** Before undertaking graduate study, a student should have completed substantially the equivalent of the above schedule of studies. Undergraduate deficiencies may be made up during the first year of graduate work.

**Polymers and Wood:** Before undertaking graduate study, a student should have completed a baccalaureate program in one of the following areas: polymer science and engineering, wood
science and engineering, materials science, chemical engineering, civil engineering, mechanical engineering, chemistry, or physics.

Department of Pure and Applied Mathematics


The Department of Pure and Applied Mathematics provides undergraduate instruction and training in all major fields of mathematics. The numerous service courses taught by the department reflect the growing importance of mathematics in an increasing number of other disciplines.

In addition to the traditional curriculum for mathematics majors, options have been developed specifically to prepare students for careers in applied analysis, operations research, computational mathematics, applied statistics, actuarial science, and secondary mathematics teaching.

The mathematics major also prepares students for graduate study in such fields as business, economics, management science and computer science, as well as mathematics and statistics.

Graduate study and specialization are offered by the department in the usual classical and a number of modern areas. A Doctor of Arts program is specially designed for future college teachers, while the several options in applied mathematics, which include an internship experience, provide graduate preparation for mathematical careers in business and industry.

Astronomy and statistics courses at both the undergraduate and graduate levels are administered by the department. Instruction in astronomy is enhanced by the use of a 12-inch refractor at the Jewett Observatory and a Spitz planetarium. The mathematics library receives current copies of over 300 journals in many languages. It also has sets of collected works and an extensive collection of advanced treatises. Talented undergraduate majors in mathematics are given individual and small group instruction outside of class, sometimes resulting in research publications.

Entering freshmen whose preparation is sufficiently good, as determined by high school records and other evidence, will be permitted to enroll directly in courses for which they are qualified. Upon satisfactory completion of such a course, they may receive advanced placement credit for certain of the prerequisite mathematics courses.

The department offers courses of study leading to the degrees of Bachelor of Science in Mathematics, Master of Science in Mathematics, Doctor of Arts, and Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Mathematics

101 Intermediate Algebra 3 Prereq appropriate math placement score. Fundamental algebraic operations and concepts.

103 [Z] Statistical Thinking 3 Prereq 2 yrs HS algebra or Math 101. Scientific explanation; correlations and causality; presenting statistical evidence; graphical and numerical methods; chance and gambling; the bell-shaped distribution.


107 Precalculus Mathematics 4 Prereq 3 yrs HS mathematics or Math 101. Basic concepts of algebra, trigonometry, and analytic geometry. Credit not granted for both Math 107 and 140.


140 [Z] Mathematics for Life Scientists I 4 Prereq Math 101 or 2 yrs HS algebra. Basic mathematical operations applied to problems in life sciences; polynomial, periodic, exponential, logarithmic functions; graphical methods; differential and integral calculus. Credit not
granted for Math 140 and any one of Math 107, 171, 202, 206.

141 [Z] Mathematics for Life Scientists II 4 Prereq Math 140. Continuation of Math 140. Differential equations; functions of several variables; probability; complex numbers; vectors and matrices.


172 Calculus II 4 Prereq Math 171. Techniques and applications of one variable calculus; estimations; series, derivative of a vector function.

198 [Z] Mathematics Honors 3 Credit not granted for both Math 116 and 198.

201 [Z] Introduction to Finite Mathematics 3 Prereq 2 yrs HS algebra or Math 101. Basic notions of logic, linear algebra, matrices, and analytic geometry; applications to linear programming. Credit not normally granted for both Math 201 and 220.

202 Introduction to Mathematical Analysis 3 Prereq Math 107 or 201. Differential and integral calculus of the polynomial, exponential, and logarithmic functions. Credit not normally granted for more than one of Math 140, 171, 202, and 206.

205 [Z] Finite Math for Architects 3 Linear algebra, analytic geometry, linear programming, applications to architecture. Credit not normally granted for more than one of Math 201, 205, and 220.

208 Mathematical Analysis for Architects 3 Prereq Math 107. Calculus of elementary functions; trigonometry; applications to architecture. Credit not normally granted for more than one of Math 140, 171, 202, and 206.

220 Introductory Linear Algebra 2 Prereq Math 171 or c/. Elementary linear algebra with geometric applications. Credit not normally granted for both Math 201 and 220.

273 Calculus III 2 Prereq Math 172; 220 or c/. Calculus of functions of several variables.

300 [Z] Mathematics for Elementary Education II 3 Prereq Math 105. The nature of mathematical thought patterns; concrete foundations of the natural and rational number systems, the development of mathematical operations.

302 Theory of Numbers 3 Prereq Math 172, 220. Divisibility properties of integers; congruences; diophantine equations; quadratic residues.

303 Higher Geometry 3 Prereq Math 220. Geometry as a deductive system of logic, postulational systems; projective and non-Euclidean geometries.

315 Differential Equations 3 Prereq Math 172, 220; 273 recommended. Linear differential equations and systems; series, numerical and qualitative approaches; applications.

316 Discrete Structures 3 Same as Cpt 316.

320 Elementary Modern Algebra 3 Prereq Math 220. Algebra as a deductive system; number systems; groups, rings, and fields.

325 Elementary Combinatorics 3 Prereq Math 220. Introduction to combinatorial theory and graph theory with applications to economics, computer science, and network theory.


364 Principles of Optimization 3 Prereq Math 202 or 220. Algebra of linear inequalities; duality; graphs, transport networks; linear programming; special algorithms; nonlinear programming; selected applications.

371 Introduction to Analysis 3 Prereq Math 273, 315. Completeness of real numbers, the theory of integration and differentiation, sequences of functions, Taylor's formula, power series.


408 Mathematics for Economists 3 Prereq Math 201, 202. Mathematical topics applicable to modern economic analysis and research.
410 Theory of Functions of a Complex Variable 3 Prereq Math 273, 315. Cauchy's theorem; Taylor and Laurent series; calculus of residues; conformal mapping; special functions applied to engineering and physical sciences.

415 Intermediate Differential Equations 3 Prereq Math 315. Linear systems; qualitative theory (existence, uniqueness, stability, periodicity); boundary value problems; applications.

417 Introduction to Simulation 3 Same as QMath 417.

420 Linear Algebra 3 Prereq Math 220. Advanced topics in linear algebra including similarity transformations, canonical forms, dual spaces, Hermitian matrices, bilinear forms.

421 Algebraic Structures 3 Prereq Math 220. Properties of algebraic structures and their homomorphisms, semi-groups, groups, rings, unique factorization domains, fields.

425 General Topology 3 Prereq Math 371. Sets, metric spaces, topological spaces; continuous mappings, compactness, connectedness, local properties, function spaces, and fundamental groups. Credit not granted for both Math 425 and 525.

431 Topics in Science and Mathematics Teaching 1 or 2 May be repeated for credit. Prereq Math 172, or Math 105, or Bio S 430, or c/ / . New curricula and pedagogical techniques for middle school instruction in science and mathematics.

435 Astronomy and Astrophysics 3 May be repeated for credit; cumulative maximum 6 hours. Same as Astr 435.

440 Applied Mathematics I 3 Prereq Math 273, 315. Partial differential equations; Fourier series and integrals; Bessel functions; calculus of variations; vector calculus; applications.

441 Applied Mathematics II 3 Prereq Math 273, 315. Complex variable theory including analytic functions, infinite series, residues, and conformal mapping; Laplace transforms; applications.

448 Numerical Analysis 3 Prereq FORTRAN programming; Math 273, 315. Interpolation and approximation; numerical quadrature; solution of linear systems of equations; nonlinear equations; solution of ordinary differential equations.

464 Operations Research and Game Theory 3 Prereq Math 273. Linear and integer programming; optimization problems; applications to economic and military strategies; rectangular games; minimax theory.

466 Optimization in Networks 3 Prereq Math 364 or 325. Formulation and solution of network optimization problems including shortest path, minimum cost flow, assignment, covering, postman, traveling salesman and location.

481 Topics in Analysis 3 May be repeated for credit.

497 Instructional Practicum V 1-2 May be repeated for credit; cumulative maximum 2 hours. By interview only.

499 Special Problems V 1-4 May be repeated for credit.

500 Proseminar 1 May be repeated for credit; cumulative maximum 2 hours.


507 Advanced Theory of Numbers 3 May be repeated for credit; cumulative maximum 6 hours. Analytic and algebraic number theory.


509 Foundations of Mathematics 3 The basis of mathematics in logic and set
theory; continuum hypothesis; Godel's theorems, recent developments. (a/y)

512 Ordinary Differential Equations I 3 Prereq Math 371. Existence of solutions; linear systems; qualitative behavior, especially stability; periodic solutions.

525 General Topology 3 Graduate level counterpart of Math 425; additional requirements. Credit not granted for both Math 425 and 525.

526 Advanced Topology 3 Prereq Math 421; Math 425 or 525. General topology; basic ideas of algebraic topology.

538 Topics in Modern Astrophysics 3 May be repeated for credit; cumulative maximum 9 hours. Same as Astr 538.

539 Group Representation Theory and Applications 3 Prereq Phys 402 or 406 or Chem 531; Math 420. Group theory, matrix groups, group representations, and selected applications from physics and chemistry.


544 Computational Linear Algebra 3 Numerical solution of linear systems of equations; linear least square problems; matrix eigenvalue and eigenvector computation; error analysis.


550 Advanced Topics in Geometry 3 Projective, affine, and non-Euclidean geometries and their relation to abstract algebra and differential geometry. (a/y)

551 Groups and Topological Groups 3 May be repeated for credit. Prereq Math 421, 425. Group theory and theory of topological algebraic structures. (a/y)

564 Topics in Optimization 3 May be repeated for credit. Prereq Math 371, 464, 544; Cpt S 151. Advanced topics in the theory and computing methodology in optimization with emphasis on real-life algorithmic implementations.


581 Seminar in Analysis 3 May be repeated for credit.

582 Seminar in Algebra 3 May be repeated for credit.

583 Seminar in Applied Mathematics 3 May be repeated for credit.

584 Seminar in Topology and Geometry 3 May be repeated for credit.

585 Seminar in Number Theory 3 May be repeated for credit. (a/y)

586 Topics in Mathematical Modeling in Natural Sciences 3 May be repeated for credit; cumulative maximum 12 hours. Selected topics in the mathematical modeling of physical and biological phenomena.

590 Seminar in Undergraduate Mathematics Instruction 3 May be repeated for credit; cumulative maximum 6 hours. Curricular and other problems of teaching mathematics to undergraduates.

591 Seminar in the History of Mathematics 1 Topics in the history of mathematics to 1800.

592 Seminar in the History of Mathematics 1 Topics in the history of mathematics from 1800 to present.

600 Special Projects or Independent Study Variable credit.

602 Internship V 2-12 May be repeated for credit. Prereq 40 hrs graduate work. A structured internship from 3-9 months; teaching at the postsecondary level or applied work in a non-academic environment.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Statistics

Stat

420 (429) Statistical Analysis of Qualitative Data 3 Prereq Math 202 or Math 140 and a previous course in statistics. Binomial, Poisson, multinomial distribution; contingency tables, Fisher's test, loglinear models; ordinal data; applications in biology, business, psychology, and sociology.

430 Statistical Methods in Engineering 4 Same as Biom 430.

443 Applied Probability 3 Prereq Math 172, 220. Axioms of probability theory; random variables; expectation; generating function; law of large numbers; central limit theorem; Markov chains. Credit not normally granted for both Stat 430 and 443.

444 Introduction to Statistical Theory 3 Prereq Stat 443 or Biom/Stat 430. Sampling distributions; hypothesis testing and estimation; maximum likelihood; likelihood ratio tests; theory of least squares; nonparametrics.

470 Computer Methods in Probability and Statistics 3 Same as Cpt S 455.

472 Statistical Packages 1 (0-3) May be repeated for credit; cumulative maximum 3 hours. Prereq course in stat methods. No previous computer experience required. Computer techniques for statistical methods; comparison of capabilities of major statistical packages; analysis techniques, graphics, terminal use, data structures, numerical algorithms.

512 Analysis of Variance and Experimental Design 3 Same as Biom 512.

514 Nonparametric Statistics 3 Prereq BMI/Stat 512. Conceptual development of basic nonparametric tests including their power, efficiency, and ARE. Cooperative course taught at the University of Idaho.

516 Time Series 3 Same as QMeth 516.

519 Applied Multivariate Analysis 3 Same as QMeth 519.

521 Multivariate Analysis 3 Prereq Math 220; Biom/Stat 512. Multivariate normal Hotelling's $T^2$, multivariate general linear model, discriminant analysis, covariance matrix tests, canonical correlation and principal component analysis. Cooperative course taught at the University of Idaho.

530 Applied Linear Models 3 Same as Biom 530.

531 Econometrics 3 Same as Econ 511.

533 Linear Model Theory 3 Prereq Stat 443; Math 420. Theoretical basis of linear regression and analysis of variance models; a unified approach based upon the generalized inverse. Cooperative course taught at the University of Idaho.

544 Applied Stochastic Processes 3 Prereq Stat 443 or Biom 430. Poisson and Markov processes; queuing theory; auto-covariance; stationarity; power spectra; harmonic analysis; linear mean-square predictions.

548 Statistical Theory I 3 Prereq Math 273; Stat 430. Probability spaces, combinatorics, multidimensional random variables, characteristic function, special distributions, limit theorems, stochastic processes, order statistics.

549 Statistical Theory II 3 Prereq Stat 548. Continuation of Stat 548. Statistical inferences; estimation and testing hypotheses; regression analysis; sequential analysis and nonparametric methods.

560 Mathematical Statistics and Probability Theory 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Math 371; Stat 549. Distribution-free statistics; stochastic processes and Markov chains; measure-theoretic foundations of probability.

561 Mathematical Statistics and Probability Theory 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Stat 560. Continuation of Stat 560.

562 Mathematical Genetics 3 Prereq GenCB 301; Stat 443 or Biom 412. Statistical approaches to Mendelian and population genetics; theories and estimation of genetic parameters; testing genetic hypotheses. (a/y)

571 Reliability Theory 3 Prereq Stat 443 or Biom 430. Statistical concepts; stochastic material strengths and lifetimes; strength vs safety analysis; reliability of coherent systems; maintenance models; complex systems. (a/y)

572 Data Analysis 3 Prereq Math 220; Stat 443 or 548. Robust statistical methods resistant to failure of model assumptions; smoothing; curve-fitting; multivariable relationships; clustering.

Schedule of Studies

A major in mathematics requires Math 171, 172, 220, 273, 315, 371, 420 and 421, plus 15 hours of mathematics electives numbered
above 300 (Stat 443 and at least one of Math 340, 364, and 440 are recommended electives); Cpt S 150, 151 or Cpt S 203; Phys 201, 202 and Engl 201.

Students contemplating graduate work in mathematics should give special consideration to Math 375, 410, 448, and 481 as electives. At least one of the foreign languages, French, German or Russian through 199 or 203, is strongly recommended.

For students with interests in the options below, the indicated modifications in these requirements should be made.

Computational Mathematics: Additional recommendations: two courses from Math 364, 440, 441, 464; Stat 443; Math 448; Cpt S 260, 330, 360; E E 414.

Applied Analysis: Additional recommendations: Math 440, 441 or Math 364, 464; Math 410; Math 448; Stat 443; Cpt S 330; a year's course in depth in an appropriate applied area outside of the Mathematics Department is recommended in addition to the mathematics requirements.

Applied Statistics: Stat 360, 443, and 444 are required. In addition to these basic requirements, at least two courses should be selected from Math 364, 464, 448 or any Stat course numbered above 400.

Actuarial Science: Stat 360, 443, and 444 are required; Math 364 and 448, Econ 201, 203 and 320, Acctg 230 and 231, and Ins 320 are all strongly recommended.

Operations Research: Math 364, 464 and Stat 443 are required; Math 417, 448, 466 and Stat 470 are strongly recommended. Additional recommendations include Math 325, 340, QMath 540, 542.

Secondry Education: Math 320 and 303 may be substituted for Math 420 and 421; either Math 330 or Math 431 plus one hour of 497 (but not both) should be taken; electives should be content courses (not 300, 497); the requirements for a provisional teaching certificate with teaching major in Math must be met.

MATHEMATICS MINOR

A mathematics minor requires 18 hours, with at least 9 hours of upper division credits (excluding Math 300, 330, 431, and 497). GPA requirements for the major (see graduation requirements) also apply to the minor in mathematics.

Courses required for either the major or minor are not to be taken pass/fail.

Preparation for Graduate Study

As preparation for work toward an advanced degree in mathematics, a student should have completed the equivalent of the above schedule of studies. Adequate opportunities are provided for removing deficiencies through the taking of appropriate courses. Graduate students who contemplate undertaking studies leading to a doctoral degree should contact the department for advice and assistance in the development of their plans.

Department of Mechanical Engineering


The field of mechanical engineering is concerned with: (a) the use and economical conversion of energy from natural sources into other useful energy to provide power, light, heat, cooling and transportation, (b) the design and production of machines to lighten the burden of human work, (c) the creative planning, development and operation of systems for using energy, machines and resources, and (d) the processing of materials into products useful to people. Employment opportunities are available for participation in mechanical design, systems design, equipment development, project engineering, production management, applied research and sales and service.

The curriculum emphasizes courses fundamental to all aspects of mechanical engineering and there is an opportunity to take elective courses to strengthen a student's background or to pursue special interests. Graduates are prepared to enter the field as engineers or to continue into a graduate program. An engineering internship program is available for students to gain industrial experience during their academic careers. An integrated BS/MS program facilitates the completion of a master's degree in one additional year beyond the bachelor's degree.
The department offers courses of study leading to the degrees of Bachelor of Science in Mechanical Engineering (accredited by the Accrediting Board for Engineering and Technology) and Master of Science in Mechanical Engineering. The department offers a course of study leading to the doctoral degree with a major in Mechanical Engineering under the Engineering Science Program.

**Description of Courses**

*For explanation see Index under "Symbols"

**M E**

101 **Graphic Design 2** (1-3) Orthographic theory, conventions, and visualization; isometric and oblique pictorials; introductory engineering design considerations.

102 **Descriptive Geometry 2** (1-3) Prereq M E 101. Graphical analysis and solution of spatial problems from all engineering fields; visualization and communication skills.

203 **Metals Processing 1** (0-3) Basic manufacturing methods in use in modern industries; materials forming and joining techniques; machinery capabilities; precision measurement.

210 **Production Processes 4** (3-3) Metal processing, cutting and fabrication; laboratory experience in basic processing techniques.

212 **Systems Design 2** Prereq Math 172; Cpt S 203 or c/; Phys 201 or c/. Application of design and experimentation to mechanical engineering problems.

301 **Fundamentals of Thermodynamics 3** Prereq Phys 201; Math 315 or c/. Thermodynamic properties of matter, ideal and real gases, work and heat, first second laws and their application to engineering systems.

302 **Thermodynamic Systems 3** Prereq Chem 106; M E 301; major in engr. Power and refrigeration cycles, thermodynamic relations, mixtures and solutions, reacting systems and application to combustion processes; phase and chemical equilibrium.

303 **Fluid Dynamics 3** Prereq M E 301; major in engr. Laminar and turbulent flow of ideal and viscous fluids; pipe flow; boundary layers; wing theory; supersonic flow; nozzles, shock waves.

305 **Laboratory II 1** (0-3) Prereq M E 302 or 303 or c/; major in engr. Experiments related to principles of compressible and incompressible fluids, thermodynamics, and thermodynamic cycle components.

312 **Kinematic Analysis 3** (2-3) Prereq C E 212; major in engr. Motion transfer; velocity, acceleration, and inertia forces in machines; static and dynamic force systems; cam profiles; gears and gearing systems.

313 **Engineering Analysis 3** Prereq Math 315; Cpt S 203; major in engr. Analysis and modeling of engineering problems utilizing numerical and mathematical techniques and the computer, including the analog computer.

315 **Fabrication and Materials Laboratory 2** (1-3) Prereq C E 314. Materials properties and fabrication techniques; laboratory examples from mechanics of materials; manufacturing techniques, numerical control.

320 **Materials Laboratory 1** (0-3) Prereq C E 314 or c/; major in engr. Mechanical behavior of materials and application to engineering structures.

348 **Dynamic Systems 4** (3-3) Prereq M E 313. Fundamentals of vibration analysis, control systems, system modeling, and dynamics analysis; laboratory investigations.

404 **Heat Transfer 3** Prereq M E 303; major in engr. Conduction, radiation, and convection heat transfer; analytical, numerical, experimental results for solids, liquids, and gases; heat exchanger design.

406 **Laboratory III 3** (1-6) Prereq M E 305; 404 or c/; major in engineering. Investigations involving solid-body mechanics, heat transfer, and fluid mechanics.

414 **Machine Design 3** Prereq C E 314; M E 320; major in engr. Optimal design of machinery; analysis for prevention of machine elements failure.

416 **Design of Engineering Systems 3** (1-6) Prereq MSE 301; M E 312, 414; major in engr. Design of mechanical systems integrating thermal sciences and solid-body mechanics aspects.

417 **Design of Thermal Systems 3** (1-6) Prereq M E 404 or c/; major in engr. Detailed design of thermal power systems.

419 **Air Conditioning 3** Prereq M E 302, 404. Principles of heat and moisture
Transfer; air motion and purity in buildings; design of systems.

435 Thermal Systems 3 Prereq M E 302; M E 404 or c/. Thermal systems of current interest in processes and power industries; combustion, cryogenics, direct energy conversion, nuclear power.

436 Combustion Engines 3 Prereq M E 302. Internal combustion engines; spark ignition engines, diesels, and gas turbines.

439 Applied Aerodynamics 3 Prereq C E 315 or M E 303. Aerodynamic lift and drag; circulation; boundary layers; application to vehicle and structural design and pollution control.

449 Mechanical Vibrations 3 Prereq M E 313; major in engr. Damped and undamped systems of single and multidegrees of freedom; transmissibility; isolation; log decrement; energy methods; applications.

470 Kinematic Synthesis 3 Prereq M E 312. Analytical and graphical techniques applied to the analysis and synthesis of planar mechanisms. Credit not granted for both M E 470 and 570.

472 Mechanical Systems Design 3 Prereq M E 414. Assessment of performance and detail design of selected mechanical system components, concepts and assemblies. Credit not granted for both M E 472 and 572.

473 Computer Aided Design 3 (2-3) Prereq Cpt S 203; M E 313; major in engr. Interactive computer programming and graphics in the design of engineering systems.

474 Production Engineering 3 Techniques of manufacturing process specification, tooling, process cycles, facilities planning, process control, and profit analysis. Credit not granted for both M E 474 and 574.

481 Control Systems 3 Prereq M E 348. Analysis and design of feedback control systems. Credit not granted for both M E 481 and 581.

495 Internship in Mechanical Industry 2 May be repeated for credit; cumulative maximum 6 hours. By interview only. Student to work full time on engineering assignment in approved industries with industrial and faculty supervision.

499 Special Problems V 1-4 May be repeated for credit.

510 Macroscopic Thermodynamics V 2-3 Advanced thermodynamics from macroscopic viewpoint; basic postulates, equilibrium, stability, property relations; application to thermal-fluid and solid mechanics; irreversible thermodynamics.

511 Microscopic Thermodynamics V 2-3 Microscopic development of equilibrium; classical and quantum particle statistics; statistical description of real and ideal gases, solids, and liquids.

512 Physical Gas Dynamics V 2-3 Prereq M E 510 or 511. Kinetic theory of gases; molecular view of fluid dynamics; applications to momentum, energy, mass transport, molecular dynamics in laser scattering. (a/y)


514 Thermal Radiation Processes V 2-3 Prereq M E 404 or 563. Thermal radiation within enclosures, ideal and real surfaces; radiative processes within absorbing/emitting media; applications to furnaces, solar energy systems.

515 Convective Heat Transfer 3 Prereq M E 521. Derivation of the energy conservation equation; laminar and turbulent forced convection heat transfer with internal and external flow; free convection.

520 Continuum Mechanics 2 Development of the basic laws governing a continuum continuity, momentum, and energy.

521 Transport Phenomena 2 Prereq M E 520. Application of the basic laws of continuum mechanics to fluids; momentum, heat, mass, and species conservation.

522 Viscous Fluid Flow V 1-3 May be repeated for credit; cumulative maximum 3 hours. Prereq M E 521. Properties of real fluid flow, solutions of Navier-Stokes equations, concepts of the boundary layer, transition and turbulence.

523 Computational Methods for Thermal Systems 3 Thermodynamic property formulations for modeling and analysis of thermal systems; availability and irreversibility concepts for analysis of complex energy systems. Cooperative course taught at the University of Idaho. (a/y)

524 Flow of Compressible Fluids 2 Prereq M E 303; Math 440 or c/. Quasi-one-dimensional flow, shock waves, unsteady one-dimensional flow and steady
two-dimensional flows. (a/y)

525 Potential Flow 1 Prereq Math 440. Potential flow over cylinders, airfoils, vortex motion and axisymmetric flows.

526 Thermodynamic Property Formulations 3 Thermodynamic property formulations from experimental measurements; weighted least squares fitting techniques; multiple regression analysis of analytic functions for thermodynamic property relations. Cooperative course taught at the University of Idaho. (a/y)

531 Elasticity 2 Prereq M E 520. Systematic treatment of the stress, strain, and displacement of a linear, homogeneous body under the influence of external forces.

532 Finite Elements 3 Same as C E 532.

533 Mechanical Behavior of Materials 3 Prereq M E 531. Quantitative methods of dealing with material behavior; plastic and brittle response of materials to external loads and deformation.

540 Advanced Dynamics of Physical Systems 3 Newtonian dynamics, rotating coordinate systems; Lagrangian and Hamiltonian mechanics; gyroscopic mechanics, other applications.

541 Advanced Mechanical Vibrations V 2-3 Prereq M E 449. Response of single and multi-degree of freedom systems; finite element formulation; matrix methods, random vibrations. (a/y)

542 Optimal Control of Dynamic Systems 3 Introduction to optimal control theory, differential games, and multiple criteria systems. Applications in engineering, biology, economics, agriculture, and medicine.


551 Turbulent Flow and Diffusion V 1-3 Same as C E 551. (a/y)

552 Experimental Methods in Thermal-Fluid Science 3 (2-3) Theory and practice in the use of instrumentation for measuring temperature, velocity, pressure, and concentration; measurement of classical flow fields. (a/y)

553 Two-Phase Flow V 1-3 May be repeated for credit; cumulative maximum 3 hours. Prereq M E 521. Fundamentals of the flow of fluids with two phases and applications. (a/y)

556 Numerical Modeling in Fluid Mechanics 3 Same as C E 556. (a/y)

561 Combustion V 2-3 Prereq M E 510 or 511. General combustion phenomena, chemical reactions, combustor modeling, laminar and turbulent flame theory, emissions. (a/y)

562 Synthesis of Thermal Power Systems 3 Prereq M E 302. Critical design and evaluation of the performance of the components of various thermal power systems; system arrangements, component compatibility.

563 Advanced Heat Transfer 3 Prereq M E 404. Advanced level heat transfer with emphasis on the engineering design aspect of heat transfer.

569 Advanced Topics in Thermal and Fluid Sciences V 1-3 May be repeated for credit. Advanced topics in thermodynamics, heat transfer or fluid mechanics; analytical and experimental methods.

570 Kinematic Synthesis 3 Graduate level counterpart of M E 470; additional requirements. Credit not granted for both M E 470 and 570.

572 Mechanical Systems Design 3 Graduate level counterpart of M E 472; additional requirements. Credit not granted for both M E 472 and 572.

574 Production Engineering 3 Graduate level counterpart of M E 474; additional requirements. Credit not granted for both M E 474 and 574.

579 Advanced Topics in Design and Manufacturing V 1-3 May be repeated for credit.

581 Control Systems 3 Graduate level counterpart of M E 481; additional requirements. Credit not granted for both M E 481 and 581.

589 Advanced Topics in Dynamics and Controls V 1-3 May be repeated for credit; cumulative maximum 9 hours.

598 Seminar 1 May be repeated for credit. Seminar on current research interests.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit (for PhD in Engineering Science only).

Schedule of Studies

The Bachelor of Science degree in Mechanical Engineering requires a total of 125 semester
Program in Basic Medical Sciences

hours. At least 60 of the total hours required for this degree must be in upper-division courses.

Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Arts and Hum Electives</td>
<td>3</td>
</tr>
<tr>
<td>Cm Prof Elective</td>
<td>3</td>
</tr>
<tr>
<td>Math 171 Calculus I</td>
<td>4</td>
</tr>
<tr>
<td>M E 101 Graphic Design</td>
<td>2</td>
</tr>
<tr>
<td>Chem 105</td>
<td>4</td>
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Second Semester

<table>
<thead>
<tr>
<th>Hours</th>
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<tbody>
<tr>
<td>Econ 201 Fundamentals</td>
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<tr>
<td>Cpt S 203 Computer Prog</td>
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<tr>
<td>Chem 106 Principles</td>
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<tr>
<td>Math 172 Calculus II</td>
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<tr>
<td>M E 102 Desc Geometry</td>
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Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Math 273 Calculus III</td>
<td>2</td>
</tr>
<tr>
<td>Math 220 Linear Algebra</td>
<td>2</td>
</tr>
<tr>
<td>Phys 201 Classical Physics</td>
<td>4</td>
</tr>
<tr>
<td>C E 211 Statics</td>
<td>3</td>
</tr>
<tr>
<td>M E 210 Production Processes</td>
<td>4</td>
</tr>
</tbody>
</table>

Second Semester

| Social Science Elective | 3 |
| Math 315 Diff Equations | 3 |
| Phys 202 Classical Physics | 4 |
| C E 212 Dynamics | 3 |
| M E 212 Systems Design | 2 |

Junior, Senior Years

<table>
<thead>
<tr>
<th>Hours</th>
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<tbody>
<tr>
<td>M E 301, 302, 303, 404</td>
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<tr>
<td>M E 312, 313, 348, 414</td>
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<tr>
<td>M E 305, 320, 406</td>
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<tr>
<td>MSE 301</td>
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<tr>
<td>C E 314</td>
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<tr>
<td>E E 214, 301, 302</td>
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<tr>
<td>M E 416 or 417</td>
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<tr>
<td>M E or Technical Electives</td>
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<tr>
<td>Arts, Hum, Soc S Electives</td>
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<tr>
<td>Engl 402 or Com GUR</td>
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</tbody>
</table>

High school biology or one semester of biological science is required.

CERTIFICATION

Students who have completed at least 30 semester hours of course work and who have completed Engl 101, M E 101, Math 171, Math 172, Chem 105, Phys 201 and C E 211 or their equivalent are eligible to apply for certification into the Department of Mechanical Engineering. Applications for certification will be reviewed by a departmental committee. When it becomes necessary to limit enrollment, the overall g.p.a. as well as the g.p.a. for the prerequisite courses listed above will be important factors. Preference will be given to applications received before April 15 for the fall semester and November 15 for the spring semester. Students who are required to be certified but who have not completed all of the prerequisite courses will be placed in a pre-engineering major and assigned to a mechanical engineering adviser. Additional details and application forms are available from the department office.

Transfer Students

The Department of Mechanical Engineering cooperates with the community colleges in Washington to minimize problems associated with transfer. Inquiries concerning specific questions are welcome. A strong preparation in mathematics and physics is necessary prior to transfer to minimize the time required at Washington State University to complete the bachelor's degree requirements.

The requirements for direct entry into the Department of Mechanical Engineering upon transfer are the same as listed above for certification. Transfer student applications will be handled by the Admissions Office and the department so that students do not need to make separate application to the department.

Preparation for Graduate Study

Before undertaking graduate study, a student should have completed substantially the equivalent of the above schedule of studies. Students from other scientific disciplines (such as physics, chemistry, mathematics) are encouraged to apply. Specific details concerning prerequisites for such students are worked out on an individual basis.

Program in Basic Medical Sciences

Associate Professor and Program Chair, R. J. Adkins; Professors, R. W. Brosemer, H. A. Dengerink, W. M. Dickson, B. A. McFadden, R. G. Yount; Associate Professors, M. Griswold, D. W. King, K. L. Melvor, J. L. Paznokas, L. E. Perryman; Assistant Professor, J. Mallatt; Clinical Affiliates, J. C. Barnes, S. Dean, A. Devlin, R. Donati, R. Dunn, A. Evans, A. Frostd, W. Furrer, R. Gabler, C. Guerst, R. Helin, J. Huberty, W. Jeff, D. Magaret, M. Martinez, M. Murphy, E. Riegle

The Program in Basic Medical Sciences is an integral part of the Washington-Alaska-Montana-Idaho (WAMI) Program in the Extension of Medical Education, and course work is parallel with and equivalent to the first year curriculum of the University of Washington School of Medicine. The entire program is taught in concert with the University of Idaho which, along with the University of Alaska and Montana State University, is also a WAMI university. With few exceptions, courses are taught on both campuses with faculty from WSU and Idaho taking part in each; WAMI student being taught as a single class. All WAMI students are members of the first year class of the University of Washington School of Medicine and all courses may apply to the M.D. degree granted by that university.

Because of specialized support material required and the nature of course content, course enrollment is restricted. With the approval of the program chair and the student's advisor, certain of the courses listed below may be used in graduate programs leading to advanced degrees granted by other academic units.

In accordance with School of Medicine policy, all Med S courses are S, F graded.

Description of Courses

For explanation see Index under "Symbols"

Med S
501 Medical Preceptorship 1 may be repeated for credit; cumulative maximum 2 hours. For WAMI students only. Practical, observations of medical practice in Whitman County with individual physician volunteers.

510 Histology 3 (2-3) Description and microscopic examination of cell types, tissues, and major organs of the human body.

511 Anatomy of the Trunk 3 (2-3) Prereq: WAMI student. Extensive regional study of human thorax, abdomen, pelvis, and perineum; embryology and living anatomy; correlates gross with clinical anatomy.

512 Basic Mechanisms in Cellular Physiology 4 Basic physiology mechanisms, primarily at the cellular level.

513 Introduction to Clinical Medicine I 1 For WAMI students only. Instruction in communications skills and interview techniques to form the basis for the eventual doctor-patient relationship.

514 Molecular and Cellular Biology I 3 Classical molecular and cellular biochemistry, cellular physiology and molecular genetics.

515 The Ages of Man 2 Physical and psychological development of the whole individual from birth through old age.

516 Biology of Cells 2 For WAMI students only. Human cell biology basic to other courses; structure, function, differentiation and interaction.

520 Cell and Tissue Response to Injury 4 (3-3) Patterns of cell and tissue response to injury; immunity and immune responses.

521 Natural History of Infectious Disease and Chemotherapy 5 (4-3) Pathogenesis and immunity of infectious diseases, clinical manifestations and control of representative bacterial, fungal, parasitic, and viral infectious diseases.

522 Introduction to Clinical Medicine II 2 For WAMI students only. Communication skills as related to and dealing with affective material.

523 System of Human Behavior 2 Conceptual systems and models of behavior, normality and abnormality, environment and social learning, conditioning related to medicine.

524 Molecular and Cellular Biology II 2 Continuation of Med S 514.

530 Epidemiology 2 Basic principles of epidemiological processes; statistical inference from clinical data.

531 Head, Neck, Ear, Nose and Throat 4 (3-3) For WAMI students only. Gross anatomy, including skull, pharynx and larynx; audition and balance.

532 Nervous System 5 (4-3) Normal structure and function of the nervous system, including the eye.

535 Introduction to Clinical Medicine III 2 (1-2) For WAMI students only. The screening physical examination.

600 Special Projects or Independent Study V 1-6 May be repeated for credit; cumulative maximum 6 hours.

Department of Military Science

Professor and Department Head, Lieutenant Colonel Michel E. Hess; Assistant Professors,
Majors P. Vacovitch, D. Kunkle, Captain D. Saffold; Staff Affiliates SGM L. Vance, SSG J. Greer.

The Department of Military Science at WSU is designed to supplement a student’s academic studies by motivating, educating, and training qualified students to serve as commissioned officers in all components of the Army (Active Army, Army National Guard, Army Reserve). The military science intellectual, professional and technical education and training complements the educational programs at WSU.

The military science curriculum normally comprises a two-year Basic Course (freshman and sophomore years), and a two-year Advanced Course (junior and senior years). The course is open to all men and women students at WSU. Students with special prerequisites (previous military service, Junior ROTC, Mil S 205, and others) may receive credit for all or part of the Basic Phase of ROTC (freshman and sophomore years). With this credit, they may enter as Military Science juniors (MS III) and thus complete the Army ROTC program in two academic years. Enrollment into the Advanced Course (MS III) must be with approval of the Department Head. During the summer between the junior and senior years of Military Science, the cadets attend an ROTC Advanced Camp (6 weeks at Ft. Lewis, WA). It is a training/testing/leadership/practicum opportunity. The camp is operated by experienced ROTC faculty and includes cadets from the Western ROTC programs.

At WSU, military science courses are academic in nature. The practical aspects of military education and training are taught in leadership labs and summer camps. Advanced Course students are required to participate in leadership labs which are conducted throughout the year. These events provide instruction in individual military skills. Practical leadership experience is gained through these activities and through peer instruction.

Advanced Course ROTC students receive a monthly stipend during the school year. It is presently $100. Competitively awarded scholarships are available which, in addition to the stipend, pay tuition, enrollment fees, and the cost of necessary equipment and supplies. High school students may apply for a four-year ROTC scholarship in the fall of their senior year; ROTC students may apply for one, two, or three year scholarships.

Students who successfully complete the Advanced Course, and graduate from WSU, are normally commissioned in the U.S. Army Reserve. Students who rank in the upper one third of their ROTC class are eligible to compete for commissions in the Regular Army. Students who wish to seek advanced degrees may apply for a delay to active duty in order to complete their studies before entering active service.

Description of Courses

For explanation see Index under “Symbols”

Basic Course

Mil S

101 The United States Army 1 Role of the Army in contemporary society.
102 National and International Role of the Army 1 Role of the Army in today’s international affairs.
110 Cougar Rangers I 1 Military adventure training, pioneering activities, military skills and small unit tactics. Field trip required.
111 Cougar Rangers II 1 Military adventure training, pioneering activities, military skills and small unit tactics. Field trip over spring break required.
201 Introduction to Leadership 2 Multidisciplinary approach to military leadership.
202 The Officer as a Professional 2 U.S. Army Officer Corps as a profession; the U.S. Army Officer as a professional.
205 Basic Summer Camp 3 Prereq 1 or 2 yrs college. By interview only. Intensive orientation and internship in military training and skills held at an active duty Army post. Application required two weeks in advance.
206 Military Science Overview 5 Preparation for advanced military science program; map reading, tactics, leadership, U.S. military history, fundamentals of army duty.

Advanced Course

Mil S

301 Applied Leadership and Management 3 Troop leadership procedures emphasizing instruction in military professionalism and ethics; practical aspects of tactics and leadership practicum.
302 Small Unit Tactics and Military Leadership 3 Preparation, delivery, and critique of practical oral presentations; leadership of small units; offensive, defensive and retrograde operations.
Department of Music of the School of Music and Fine Arts


The Music Department is committed to a tradition of excellence in performance and the study of theoretical, historical, and philosophical aspects of the musical arts. Its chief objectives are:

—to provide students with a foundation in the analysis and criticism of music and guide them toward acquiring discriminating judgment in a progressive musical environment;

—to assist the aspiring performer and composer to reach the highest potential of artistic capacity;

—to train teachers of music who can be effective in contemporary society;

—to contribute toward a varied humanistic education within the university community.

As an integral part of the academic program, the department maintains a vital offering of recitals and concerts by students, faculty, and guest artists.

Courses of study lead to the degrees of Bachelor of Music, Bachelor of Arts in Music, and Master of Arts in Music.

The Department of Music is a full member of the National Association of Schools of Music.

Description of Courses

Performance Studies in Music
Performance studies are offered on several levels to meet the needs of music majors as well as those of students from the general university community. There are no additional fees or tuition charges for either performance studies or the use of practice facilities. The 100-level performance studies are open to any student without audition through class instruction. The 200 level denotes group or private instruction for advanced non-music majors by special permission of the department chair (audition required) or study in a secondary performance medium by music majors.

Individual instruction in performance studies is offered at the 300 and 400 level for music majors, and, by special permission of the department chair, to advanced non-music majors who meet all requirements for music majors as listed below. All students enrolled in 200-300-400-level performance instruction are required to attend weekly convocation (student recital), attend recitals as required, participate in at least one approved music department ensemble, and take applied jury examinations at the end of each term. Students enrolled in 300-400-level performance study must enroll in a music theory or music history course each semester until music core requirements have been completed. No student will be permitted to enroll in 300-400-level performance studies unless all of these criteria are met. In addition, each music major must pass Mus 281 to meet the keyboard proficiency requirement, unless this has been satisfied through admission to Mus 301 or 302, or by examination.

Performance studies may not be taken on a pass-fail basis. Description of each course listed below may be obtained from the Department of Music office.
### Non-Major Performance Studies

**100 level—Class Instruction**

- **Organ**: Mus 301, Mus 302, Mus 303, Mus 304
- **Piano**: Mus 302, Mus 303, Mus 304
- **Voice**: Mus 302, Mus 303, Mus 304
- **Horn**: Mus 302, Mus 303, Mus 304
- **Trumpet**: Mus 302, Mus 303, Mus 304
- **Trombone**: Mus 302, Mus 303, Mus 304
- **Baritone**: Mus 302, Mus 303, Mus 304
- **Tuba**: Mus 302, Mus 303, Mus 304
- **Percussion**: Mus 302, Mus 303, Mus 304
- **Violin**: Mus 302, Mus 303, Mus 304
- **Viola**: Mus 302, Mus 303, Mus 304
- **Violoncello**: Mus 302, Mus 303, Mus 304
- **Contrabass**: Mus 302, Mus 303, Mus 304
- **Flute**: Mus 302, Mus 303, Mus 304
- **Oboe**: Mus 302, Mus 303, Mus 304
- **Clarinet**: Mus 302, Mus 303, Mus 304
- **Bassoon**: Mus 302, Mus 303, Mus 304
- **Saxophone**: Mus 302, Mus 303, Mus 304
- **Guitar**: Mus 302, Mus 303, Mus 304

**200 level—Secondary and Advanced**

- **Organ**: Mus 101, Mus 201
- **Piano**: Mus 102, Mus 202
- **Voice**: Mus 103, Mus 203
- **Horn**: Mus 104, Mus 204
- **Trumpet**: Mus 105, Mus 205
- **Trombone**: Mus 106, Mus 206
- **Baritone**: Mus 107, Mus 207
- **Tuba**: Mus 108, Mus 208
- **Percussion**: Mus 109, Mus 209
- **Violin**: Mus 110, Mus 210
- **Viola**: Mus 111, Mus 211
- **Violoncello**: Mus 112, Mus 212
- **Contrabass**: Mus 113, Mus 213
- **Flute**: Mus 114, Mus 214
- **Oboe**: Mus 115, Mus 215
- **Clarinet**: Mus 116, Mus 216
- **Bassoon**: Mus 117, Mus 217
- **Saxophone**: Mus 118, Mus 218
- **Guitar**: Mus 120, Mus 220

**Contrabass Flute**
- Mus 313, Mus 314
- 413, 414
- 513, 514

**Oboe**
- Mus 315, Mus 316
- 415, 416
- 515, 516

**Clarinet**
- Mus 317, Mus 318
- 417, 418
- 517, 518

**Bassoon**
- Mus 317, Mus 318
- 417, 418
- 517, 518

**Saxophone**
- Mus 317, Mus 318
- 417, 418
- 517, 518

### Major Performance Studies

Admission to the 300 level is by freshman standing examination only. Students normally progress from the 300 level to the 400 level by upper-division standing examination before a representative committee of the faculty. This evaluation will include all aspects of the student's program, including performance, literature, and core music requirements.

The 500 level denotes credit given for graduate study in a primary performance area, and is limited to enrolled graduate students pursuing a master's degree. Credit is granted on the basis of two credits for one half-hour lesson per week and four credits for two half-hour lessons per week.

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<th>Organ</th>
<th>Piano</th>
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<thead>
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### Music Performing Groups

**228/428 Opera Workshop 1** Three rehearsals a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition. Fundamentals in operatic performance.

**229/429 Ensemble Laboratory 1** (0-3) May be repeated for credit; cumulative maximum 8 hours. By audition only. Additional performance preparation and experience for selected students in vocal and instrumental emphasis.

**231/431 Choir 1** Three rehearsals a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition. Public performances each semester.

**232/432 University Singers 1** Three rehearsals a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition.

**233/433 Vocal Ensembles 1** Three rehearsals a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition. Public performance may be required.

**434 Symphony Orchestra 1** Three rehearsals a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition. Orchestral literature and public performance each semester.

**235/435 Chamber Music 1** Three rehearsals a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition. Public performance may be required.

**236/436 Concert Bands 1** Two rehearsals a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition. Public performances.

**437 Wind Symphony 1** Three rehearsals a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition. Public performances.

**238/438 Jazz-Lab Band 1** Three rehearsals a week. May be repeated for credit;
cumulative maximum 8 hours. Open to students by audition. Public performances.

239/439 Brass Ensembles 1 Three rehearsals a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition. Public performance may be required.

240/440 Woodwind Ensembles 1 Three rehearsals a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition. Public performance may be required.

241/441 Accompanying 1 Three rehearsals a week. May be repeated for credit; cumulative maximum 8 hours.

442 Chamber Orchestra 1 Three rehearsals a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition.

243/443 Percussion Ensembles 1 Three rehearsals a week. May be repeated for credit; cumulative maximum 8 hours. Open to students by audition.

244/444 Marching Band/Varsity Band 1 (0-3) May be repeated for credit; cumulative maximum 8 hours. Open to all university students by audition.

**Theory**

**Mus**

152 Music Fundamentals 2 Notation of pitch, rhythm, scales, intervals, triads, fundamental harmonic progression, coordinated with singing.

251 Materials and Structures of Music 3 Prereq Mus 152 or by examination. Overtones, melody, rhythm, intervals, tonality, modality, penta-scales, two-voiced counterpoint, analytical techniques, composition.

252 Applied Theory 1 (0-3) Prereq Mus 152 or by examination; c/ in Mus 251. Ear training, conducting, rhythmic reading, sight singing, keyboard, dictation.

253 Materials and Structures of Music 3 Prereq Mus 251, 252. Writing, analysis of three and four voiced homophonic and contrapuntal music, diatonic emphasis, seventh chords, modulation.

254 Applied Theory 1 (0-3) Prereq Mus 252; c/ in Mus 253. Ear training, sight singing, keyboard.

351 Materials and Structures of Music 3 Prereq Mus 253, 254. Vertical, linear and formal relationships of chromatic music; writing, analysis, coordinated with aural study.

352 Applied Theory 1 (0-3) Prereq Mus 254. Continued musical development in ear training, sight singing, applied theory, keyboard dictation.

353 Materials and Structures of Music 3 Prereq Mus 351. Vertical, linear and formal relationships of 20th century music; writing, analysis, listening.

354 Applied Theory 1 (0-3) Prereq Mus 352. Continued development in ear training, sight singing, keyboard, dictation, emphasizing 20th century music.

451 Modal Counterpoint Seminar 2 May be repeated for credit; cumulative maximum 4 hours. Prereq Mus 355. Contrapuntal techniques of the 16th century with original writing in the style.

452 Tonal Counterpoint Seminar 2 May be repeated for credit; cumulative maximum 4 hours. Prereq Mus 355. Contrapuntal techniques of the early 18th century with original writing in the style.

453 Form and Analysis 2 Prereq Mus 353. Organization of musical works according to the relationships in sectional divisions, thematic divisions, and tonal bases.

455 Seminar in Instrumentation 2 May be repeated for credit. Prereq Mus 352. Scoring for various instrumental combinations.

456 Seminar in Composition V 1-3 May be repeated for credit. Prereq Mus 451 or 452. Original writing in small, large forms; traditional, experimental.

550 Seminar in Analysis 2 May be repeated for credit; cumulative maximum 4 hours. Prereq Mus 453 or c/. Required of all graduate students. Application of analytical techniques to develop a basis for musical understanding and interpretation.

553 Seminar in Music Theory 2 May be repeated for credit; cumulative maximum 4 hours.

554 Seminar in Twentieth Century Styles 2 Original writing utilizing contemporary idioms. (a/y)

**History and Literature**

**Mus**

160 [H] Survey of Music Literature 3 Listening from the humanistic point of view.

161 Introduction to Critical Studies in Mu-
Mic 3 Prereq Mus 152 or 251, or c/.
Historical styles of music through analytical listening, score examination and source materials.

262 Music of Black Americans 2 Music of the Afro-American culture; African origins and development of religious and secular music.

265 Native Music of North America 2 Music and ceremonialism as a reflection of realities in North American native cultures, past and present.

360 History of Music I: Baroque and Classic Periods 3 (2-3) Prereq Mus 251, 252, 161. Development and change in the musical culture of Western Europe from 1600 to 1815.

361 History of Music II: Romantic Period and the 20th Century 3 (2-3) Prereq Mus 251, 252, 360. Development and change in the musical culture of Western Europe and the U.S. from 1815 to the present.

362 [H] History of Jazz 3 History of jazz in chronological sequence from early Dixieland to jazz-rock combinations of eighties; stylistic and improvisational developments.

363 [H] Music of Mexico and the Southwest 3 A historical survey of Chicano music; description, analysis, and forms of music from the pre-Spanish to present.

364 [H] Musical Theatre and Opera 2 Texts, music and dramatic structure of the musical theatre from Florentine Camerata to Broadway show.

460 History of Music III: Medieval and Renaissance Periods 3 Prereq Mus 251, 252. Development and change in the musical culture of Western Europe from ancient times to 1600 A.D.

464 Seminar and Colloquium in Music 2 Developing a critical attitude toward the composition and performance of music of all periods; aesthetic success, style, and performance.

465 Seminar in Major Performance Literature 2 May be repeated for credit; cumulative maximum 6 hours. Prereq Mus 351 or c/-. Survey/performance of solo and chamber literature for voice, keyboard, strings, winds, brass, percussion.

466 Seminar in Band Literature and Performance 1 May be repeated for credit; cumulative maximum 4 hours. Survey and analysis of recently published literature for use in instrumental music programs of the public schools.

560 Introduction to Graduate Studies in Music 2 Required of all graduate students in Mus. Basic bibliographic and research techniques; written presentations related to area of emphasis.

561 Seminar in Literature of Twentieth Century Music 2 Prereq Mus 351. Impressionism, expressionism, neoclassicism, neoromanticism, jazz and recent electronic music. (a/y)

562 Symphonic Literature 2 Symphony orchestra and symphonic form from its beginning to modern times studied from the score.

563 Chamber Music Literature 2 The concept and development of chamber music; study of major works. (a/y)

564 Opera Literature 2 Literature and concepts of opera from 1600 to the present.

565 Choral Literature 2 Survey of major choral works from Bach to the present. (a/y)

566 Seminar in Music History 2 May be repeated for credit; cumulative maximum 6 hours. Prereq Mus 360, 361, 460. Various historic periods and composers.

Music Education
Mus 181 Class Piano I 1 (0-3) May be repeated for credit; cumulative maximum 2 hours. For majors, minors, and Elem Educ majors only. Pedal, sightreading, transposition, playing by ear, chord progressions and melody harmonizations. Open to students by audition.

182 Class Piano II 1 (0-3) May be repeated for credit; cumulative maximum 2 hours. Continuation of Mus 181. Scales, arpeggios, blocked and broken chords; repertoire to complement individual skills and theoretical knowledge. Open to students by audition.

281 Class Piano III 1 (0-3) May be repeated for credit; cumulative maximum 2 hours. Prereq Mus 182. Principles, functional keyboard. Open to students by audition.

371 Diction for Singers I 2 Prereq Mus 303. Italian and German; International Phonetic Alphabet; fundamental diction principles, applied to each language and oriented to needs of the singer. (a/y)

372 Diction for Singers II 2 Prereq Mus 303. French and English; International
Phonetic Alphabet, fundamental diction principles, applied to each language and oriented to needs of the singer. (a/y)

382 Fundamental String Techniques 1 (0-3) Majors and minors only. Beginning class in strings.

388 Music for the Classroom Teacher 2 For elementary education majors. Movement, singing, listening and instrumental resources appropriate for use in the elementary grades.

389 Choral Program 2 (1-3) For majors, minors, and Elem Educ majors only. Choral organizations, auditions, placement, intonation, balance, blend, diction, phrasing, styles, and materials.

390 Instruments for Elementary Education 3 Prereq Educ 300. Skill building and teaching methods in percussion, melody and harmony instruments for use in the elementary grades.

393 Wind and Percussion Techniques I 2 (0-6) Prereq Mus 152. Brass, woodwind and percussion techniques; elementary instrumental conducting.

394 Wind and Percussion Techniques II 2 (0-6) Prereq Mus 152. Brass, woodwind and percussion techniques; elementary instrumental conducting.

480 Music Education 3 Philosophies, administration, organization, materials, and methods.

481 Elements of Conducting 1 Prereq Mus 251. Patterns and styles of conducting, score reading.

482 Instrumental Conducting 1 (0-3) Score reading, clefs, transposition, aural training, rehearsal techniques, ensemble seating, and programming.

483 Ensemble Conducting 1 (0-3) Prereq Mus 482. Practical laboratory experience directing musical groups in rehearsal.

485 Seminar in Vocal Pedagogy 2 Prereq performance studies in voice. Vocal technique, teaching procedures, and materials. (a/y)

486 Seminar in Piano Pedagogy 2 Prereq Mus 202. Materials and methods of teaching experiences. (a/y)

487 Seminar in String Pedagogy 2 Teaching of the strings; materials and methods. (a/y)

490 Materials and Methods for Music Teachers 2 or 3 Current programs and trends in the teaching of music on the elementary level; Dalcroze, Kodaly, Orff, Manhattanville, and ETM.

519 Secondary Performance Study 1 or 2 May be repeated for credit; cumulative maximum 6 hours. Prereq bachelor's degree in music. Instruction on instruments or voice other than major performing medium.

575 Advanced Conducting 2 or 3 May be repeated for credit. Prereq Mus 482. Rehearsing orchestras, bands, and choruses. Public performance may be required.

581 Instructional Procedures in Brass Instruments V 2-3 Prereq Mus 393, 394. Playing, teaching, and choice of materials for trumpet, horn, trombone, baritone, and tuba.

583 Seminar in Vocal Physiology 2 Physical structure of the voice, teaching procedures, and choice of materials for studio use. (a/y)

584 Instructional Procedures in Woodwind Instruments V 2-3 Prereq Mus 393, 394. Playing, teaching, and choice of materials for flute, oboe, clarinet, bassoon, and saxophone.

586 Instructional Procedures in Percussion Instruments V 2-3 Prereq Mus 393, 394. Playing, teaching, and choice of materials from drums, cymbals, timpani, and all special percussion effects.

589 Seminar in Instructional Procedures in Choral Music 2 Prereq Mus 351 and experience in chorus or choir. Choral organizations, principles, and techniques of singing; diction, intonation, quality, balance, blend, phrasing, style, and tone color; examination of materials.

590 Music Education 2 or 3 Problems of instruction, supervision, and administration.

591 Instrumental Ensemble Techniques 2 or 3 May be repeated for credit; cumulative maximum 6 hours. Instrumental programs in public schools; class instruction, rehearsal routines, program building, and examination of materials.

Problems, Research, Recitals, and Thesis

522 Graduate Recital 2 May be repeated for credit; cumulative maximum 4 hours. Private screening and public performance as required within each performance emphasis.
600 Special Projects or Independent Study
Variable credit.

700 Master's Research, Thesis, and/or Ex-
amination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

Schedule of Studies

In addition to the requirements listed under the various options for the Bachelor of Music degree and the Bachelor of Arts degree in Music, each student must satisfactorily complete a theory-history core consisting of: Music 161, 251, 252, 253, 254, 351, 352, 353, 354, 360, 361 with a 2.00 g.p.a. Each student must also satisfy the keyboard proficiency requirements by qualifying for Mus 301 or 302, passing Mus 281, or by examination. Students must complete the General University Requirements plus those for the College of Sciences and Arts totaling 39 credits.

Bachelor of Music

This four-year program offers options for specialization in performance, composition and theory, and music education. At least 42 of the 128 hours required for this degree must be upper-division courses.

The following curricula are designed to prepare students as professional musicians and teachers of music.

Students following option I, II, or III are required to present an acceptable junior and senior recital in the major performance medium.

Option I—Keyboard

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<td>Performance Studies</td>
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<td>Secondary Instrument</td>
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<tr>
<td>Mus 451 or 452 Counterpoint</td>
<td>2</td>
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<tr>
<td>Mus 453 Form &amp; Analysis</td>
<td>2</td>
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<tr>
<td>Mus 465 Sem Major Perf Lit</td>
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<tr>
<td>Mus 481 Conducting</td>
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<tr>
<td>Mus 486 Piano Pedagogy</td>
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<tr>
<td>Music Performing Groups</td>
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<tr>
<td>(to include 1 hour of Music 235/</td>
<td></td>
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<tr>
<td>435 and 1 hour of Music 241/441)</td>
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<td>Electives, 10 minimum in Music</td>
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All Keyboard Majors are required to accompany an approved junior or senior recital.

Option II—Brass, Woodwinds, Strings, Percussion

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<td>Mus 382 (if in strings)</td>
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<tr>
<td>Mus 453 Form and Analysis</td>
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<td>Mus 455 Sem in Instrumentation</td>
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<td>Mus 465 Sem Major Perf Lit</td>
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<td>Music Performing Groups</td>
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<tr>
<td>Electives, 9 minimum in Music</td>
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*Performance majors in brass, woodwind or percussion instruments will substitute Mus 393 or 394 (2 credits) for Mus 382, and complete 14 electives, 8 minimum in Music.*

Option III—Voice

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<td>Mus 453 Form &amp; Analysis</td>
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<td>Mus 465 Sem Major Perf Lit</td>
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<td>Mus 481 Conducting</td>
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<tbody>
<tr>
<td>89</td>
</tr>
</tbody>
</table>

Option IV—Music Education

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory-History Core</td>
<td>25</td>
</tr>
<tr>
<td>Performance Studies (at least 2</td>
<td></td>
</tr>
<tr>
<td>hours at the 400 level)</td>
<td>14</td>
</tr>
<tr>
<td>Mus 382, 393, 394</td>
<td>5</td>
</tr>
<tr>
<td>Mus 389 Choral Program</td>
<td>2</td>
</tr>
<tr>
<td>Mus 480, 490</td>
<td>6</td>
</tr>
<tr>
<td>Mus 453 or 455</td>
<td>2</td>
</tr>
<tr>
<td>Mus 481, 482 Conducting</td>
<td>2</td>
</tr>
<tr>
<td>Music Performing Groups</td>
<td></td>
</tr>
<tr>
<td>(Vocal performers must include</td>
<td></td>
</tr>
<tr>
<td>Mus 228/428 for one credit hour.</td>
<td></td>
</tr>
<tr>
<td>Instrumentalists should include</td>
<td></td>
</tr>
<tr>
<td>one semester of a chamber music</td>
<td></td>
</tr>
<tr>
<td>ensemble.)</td>
<td>6</td>
</tr>
<tr>
<td>Professional Education courses</td>
<td>26</td>
</tr>
<tr>
<td>H Ed 480 or 481</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
</tr>
</tbody>
</table>

*Students preparing to be Music Specialists on the elementary level may substitute Mus 390 (3 credits) for Mus 382, 482 and 1 hour of Music Performing Groups.*
Option V—Composition and Theory

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory-History Core</td>
<td>25</td>
</tr>
<tr>
<td>Performance Studies</td>
<td>14</td>
</tr>
<tr>
<td>Mus 451, 452 Counterpoint</td>
<td>4</td>
</tr>
<tr>
<td>Mus 453 Form &amp; Analysis</td>
<td>2</td>
</tr>
<tr>
<td>Mus 455 Instrumentation</td>
<td>2</td>
</tr>
<tr>
<td>Mus 456 Composition</td>
<td>12</td>
</tr>
<tr>
<td>Mus 464 Colloquium</td>
<td>2</td>
</tr>
<tr>
<td>Music Performing Groups</td>
<td>2</td>
</tr>
<tr>
<td>(to include a minimum of 1</td>
<td>4</td>
</tr>
<tr>
<td>semester of choral ensemble)</td>
<td></td>
</tr>
<tr>
<td>Electives, 14 minimum in Music</td>
<td>22</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>89</strong></td>
</tr>
</tbody>
</table>

If the student’s major performance area is neither piano nor organ, at least 4 hours of Music 202 or 302 are required.

**Bachelor of Arts in Music**

This four-year program is designed to meet the needs of students wishing a broad liberal arts background with a major in music. Of the total 120 hours required for a degree in this program, a minimum of 48 credits in music is required, 40 of which must be in upper-division courses. The music concentration may be in either theory-history or performance.

**Music Theory-History Option**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theory-History Core</td>
<td>25</td>
</tr>
<tr>
<td>Mus 451 or 452 Counterpoint</td>
<td>2</td>
</tr>
<tr>
<td>Mus 464 Colloquium</td>
<td>2</td>
</tr>
<tr>
<td><strong>Performance Studies</strong></td>
<td><strong>8</strong></td>
</tr>
<tr>
<td>(When the student’s major</td>
<td></td>
</tr>
<tr>
<td>performance area is not</td>
<td></td>
</tr>
<tr>
<td>keyboard, at least 2 hours</td>
<td></td>
</tr>
<tr>
<td>of study in piano or organ is</td>
<td></td>
</tr>
<tr>
<td>required.)</td>
<td></td>
</tr>
<tr>
<td>Music Performing Groups</td>
<td>4</td>
</tr>
<tr>
<td>Music Electives</td>
<td>12</td>
</tr>
<tr>
<td>Electives</td>
<td>28</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>81</strong></td>
</tr>
</tbody>
</table>

**Vocal or Instrumental**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Option</td>
<td></td>
</tr>
<tr>
<td>Theory-History Core</td>
<td>25</td>
</tr>
<tr>
<td>Performance Studies</td>
<td>12</td>
</tr>
<tr>
<td>(must include a minimum of 4</td>
<td></td>
</tr>
<tr>
<td>credits at the 400 level)</td>
<td></td>
</tr>
<tr>
<td>Music Performing Groups</td>
<td>6</td>
</tr>
<tr>
<td>Music Electives</td>
<td>10</td>
</tr>
<tr>
<td>Electives</td>
<td>28</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>81</strong></td>
</tr>
</tbody>
</table>

**Master of Arts in Music**

Please consult the current WSU Graduate Study Bulletin.

**Music Minor**

An approved course of study, available through the Music Department, gives details of the 21-22 credit music minor.

**Program in Native American Studies**

*Director W. Willard; Professor, A. L. Olsen.*

The program offers a minor in Native American Studies which requires a minimum of 16 hours of credit, half of which must be in upper-division course work.

The curriculum is designed to offer interdisciplinary study in a wide spectrum of courses to provide a broad knowledge of Native American cultures, so that students will be better equipped to live and work within the context of contemporary Native American society.

The Native American Program also offers opportunities to take part in activities of the Native American Resource Center, which serves to cooperatively meet, in conjunction with Native American communities, the human resources development needs identified by Native American communities.

**Description of Courses**

*For explanation see Index under "Symbols"*

**Na Am**

101 [S] Native American Studies 3 Introduction to Native American studies; introductory course to contemporary native America.

201 Issues in Contemporary Native American Reservation Development 3 Contemporary Federal-Indian-state interactions; current issues in relationship to present time reservation economic development.

205 Native American Arts 3 Same as FA 205.

208 American Indians to 1830 3 History of Native Americans from Columbus to Jackson and the impact of Europeans on the Indian peoples of North America.

209 American Indians from 1830 3 History of Native Americans from Andrew Jackson’s administration to the present
dealing with the Indian policies of the U.S. and the Indian response.

265 Native Music of North America 2 Same as Mus 265.

320 [S] Native Peoples of North America 3 Same as Anth 320.

331 [S] Archaeology of the New World 3 Same as Anth 331.

408 Indians of the Northwest 3 Native Americans of the Coast and Plateau; historic relationship with Europeans and Anglo-Americans.

409 Indians of the Southwest 3 History of Native Americans in the Southwest; contact and conflict with Europeans and Anglo-Americans.

410 Ethnic Groups and Public Education 2 or 3 Same as Educ 410.

420 Native American Perspective on Ecology 3 Patterns of interaction between American Indian groups and their environments.

422 Native Peoples of the Pacific Northwest 3 Same as Anth 422.

465 Federal Indian Policy in Relation to the Development of Indian Communities 3 Treaties, federal legislation, and policy interpretations concerning Native American communities and their development.

490 Instructional Practicum V 1-4 May be repeated for credit; cumulative maximum 4 hours.

499 Special Problems V 1-4 May be repeated for credit.

---

Naval Science

The Navy-Marine Officer Education Program administered and taught by the University of Idaho offers full and partial scholarships leading to commissions and active duty as Navy or Marine Corps officers. Normally, students enter the program at the beginning of the freshman year; however, selected students may enter up to the beginning of the junior year. Students take 20 hours 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. In addition to the professional courses, students enrolled in the Officer Education Program must also participate in naval science laboratories (NS 100) each semester. 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 commissions go on active duty at full pay and allowances immediately upon graduation.

Full 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. A student on full scholarship participates in three summer training cruises of six to eight 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, and aviation specialists. Full scholarship benefits include tuition, fees, books, and a $100 a month retainer. 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.

Partial Scholarship 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. Partial scholarship students may be nominated by the Professor of Naval Science to the Chief of Naval Education and Training for a full 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 full scholarship program. Graduates of this program are ordered to active duty with reserve commissions.

Marine Corps Option

Both full and partial scholarship 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 year and participate in summer training at the Marine
Corps Schools at Quantico, Virginia, during the summer following the junior year.

**Two-Year Program**
Navy-Marine Corps full and partial scholarship 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 the 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 full scholarships for their last two years of college. The remaining graduates receive partial scholarships.

**Field Trips**
Field trips to Navy and Marine Corps facilities are arranged periodically in order to allow the Navy/Marine Corps Officer Education Program members the opportunity to learn more about the naval service.

**Description of Courses**

**Naval Science**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>N S 100</td>
<td>Drill Lab No credit Required of all Navy-Marine Corps Officer Education Program students. One hour lab per week. Cooperative course taught by the University of Idaho.</td>
<td></td>
</tr>
<tr>
<td>N S 101</td>
<td>Introduction to Naval Science 2 Roles of major elements of naval service; design and structure of ships. Cooperative course taught by the University of Idaho.</td>
<td></td>
</tr>
<tr>
<td>N S 102</td>
<td>Ships Systems I 3 Introduction to damage control and propulsion systems of naval ships; nuclear and conventional power. Cooperative course taught by the University of Idaho.</td>
<td></td>
</tr>
<tr>
<td>N S 200</td>
<td>Seminar V 1-2 By interview only. Cooperative course taught by the University of Idaho.</td>
<td></td>
</tr>
<tr>
<td>N S 201</td>
<td>Ships Systems II 3 Naval weapons; ballistics, control, propulsion, components, systems analysis. Cooperative course taught by the University of Idaho.</td>
<td></td>
</tr>
</tbody>
</table>

202 Seapower and Maritime Affairs 2 U.S. Navy and merchant marine seapower, development, and policy. Cooperative course taught by the University of Idaho.

299 Directed Study V 1-2 By interview only. Cooperative course taught by the University of Idaho.

301 Navigation 3 Theory, principles, and procedures of terrestrial and celestial navigation. Cooperative course taught by the University of Idaho.

302 Naval Operations 3 Prereq N S 301. Naval operations and tactics, relative motion, rules of the nautical road. Cooperative course taught by the University of Idaho.

311 Evolution of Warfare 3 Evolution of war through tactics; strategy from Sun Tzu to J. F. C. Fuller. Cooperative course taught by the University of Idaho.

400 Seminar V 1-2 By interview only. Cooperative course taught by the University of Idaho.

401 Principles of Management and Organization I 2 Principles of management and administration aimed at improving the effectiveness of all types of organizations. Cooperative course taught by the University of Idaho.

402 Principles of Management and Organization II 2 Principles of management and administration as they apply to the Naval Service. Cooperative course taught by the University of Idaho.

412 Amphibious Warfare 3 Historical background of amphibious warfare and its planning and prosecution. Cooperative course taught by the University of Idaho.

499 Directed Study V 2-3 By interview only. Cooperative course taught by the University of Idaho.

**Intercollegiate Program in Nursing**

Dean and Associate Professor, T. Cleveland; Associate Professors, B. Anderson, M. Bruya, E. Byerly, S. Hanson, Z. Higgs, S. Jenkins, A. Meade, G. Tay, J. Smith; Assistant Professors, C. Allen, T. Bayne, D. Bolknap, R. Bindi, V. Brooke, C. Clark, L. Copstead, B. Davis, H. Dierks, J. Fanslow, J. Farrell, L. Felver, I. Hilly-
ard; J. Holloway; N. House; C. Hunter; D. Kollmer; M. Kline; G. Lasick; A. McMaster; J. Pendares; S. Severtson; R. Steudman; G. Synoground; J. Trilling; B. Wolf; Instructors; H. Caprye-Boos; D. Lenors; J. Peterson; J. Rhodes; D. Wilek; Lecturers; E. Coleman; C. Kroll; S. Masteller; J. Weller; Practice Laboratory Preceptors; N. Dobson; B. Paro; Librarian and Assistant Professor; B. Pringle; Counselor and Instructor; S. McClelland; Advisor (Pullman Campus); L. Berenson.

Washington State University is a participant in the three-member program providing baccalaureate nursing education in Eastern Washington. The program, open to men and women, is designed for two types of students—those with no previous preparation in nursing and registered nurses. The curriculum is four academic years for the student with no previous preparation in nursing. The length of the program for the registered nurse varies depending upon previous education and the course load carried while at the university.

The lower-division courses, freshman and sophomore years are offered on the Pullman campus. They provide the student with a foundation in the natural and social sciences and the humanities.

The upper-division courses, junior and senior years, are offered at the Intercollegiate Center for Nursing Education in Spokane and Yakima. They provide the professional preparation in nursing. To apply for admission to the center, students must have at least 60 semester hours and all courses prerequisite to nursing completed the term prior to enrollment in the upper division.

The program of study leads to the degree of Bachelor of Science in Nursing. It is approved by the Washington State Board of Nursing and accredited by the National League for Nursing. Upon successful completion of the baccalaureate program, graduates are eligible to take the state examination for licensure as Registered Nurses.

Description of Courses

The following courses are offered at the Intercollegiate Center for Nursing Education—Spokane Campus.

For explanation see Index under “Symbols”

Nurs

305 Scientific Concepts for Nursing I 3 Prereq junior in Nurs. Normal developmental physiological and psychological processes, from conception through aging; pharmacologic and nutritional factors influencing adaptation.

306 Clinical Nursing I 10 (4-18) Prereq junior in Nurs; Nurs 305; First Aid Cert or c/. Holistic view of nursing process; assessment/interventions for well individuals of all ages and mild stress situations; clinical application.

307 Assertiveness Training for Nurses 2 Prereq junior in Nurs. Assertiveness training to assist professional nurses in improving interpersonal relationships in nursing situations.

308 Gerontologic Nursing 2 Prereq junior in Nurs. Physiologic and psychologic changes of the aging process; role of gerontologic client within society; implications for nurses.

309 Historical Perspectives of Nursing 2 Prereq junior in Nurs. Evolution of nursing roles, practices, and education with emphasis on nursing in the U.S.


316 Clinical Nursing II 12 (6-18) Prereq junior in Nurs; Nurs 305, 306; Nurs 315 or c/. Nursing process, problem identification and implementation; individuals, families, pathologic concepts, pharmacologic and nutritional factors, mild-moderate stress, facilitative communication, professional responsibilities; clinical application.

404 Sexuality and Health Care 2 Prereq senior in Nurs. Sexuality and its implications for nursing intervention.

405 Introduction to Research in Nursing 3 (2-3) Prereq senior in Nurs; Nurs 315, 316. Selected concepts and processes of research utilized in the investigation of nursing problems, including beginning descriptive and inferential statistics.

406 Clinical Nursing III 12 (6-18) Prereq senior in Nurs; Nurs 315, 316; Nurs 405 or c/. Nursing process and implementation; groups and community needs, severe multidimensional stress, research and leadership theory, therapeutic communication; clinical application.

407 Ethnic Awareness for Nurses 2 Prereq senior in Nurs. Nature of inconsistencies and inequities that exist in America
which alter/deter the delivery of health care to Asians, Blacks, Chicanos, and Native Americans.

408 Nursing Trends and Issues 2 Prereq senior in Nurs. Current issues and dilemmas in nursing.

409 Suicidal Behavior: Nursing Assessment and Intervention 2 Prereq senior in Nurs. Assessment of suicidal risk; models for intervention utilized by professional nurses.

410 Advanced Concepts in the Care of the Critical Ill and Injured Patient V 3 to 5 (3-6) Prereq senior in Nurs; Nurs 406. Open to RN with basic critical care course. Exploration of nursing care of critically ill patients; new and advanced concepts.

411 Emergency Nursing V 3 or 4 (3-3) Prereq senior in Nurs; Nurs 406 or RN. Application of the nursing process to clients and families experiencing traumatic injury/sudden illness; examination of emergency health care delivery.

416 Clinical Nursing IV 12 (4-24) Prereq senior in Nurs; Nurs 405, 406. Nursing process and evaluation; individuals, families, groups, communities; change, research synthesis; leadership and management theory, clinical application in area of student interest.

499 Special Problems V 1-4 May be repeated for credit.

Schedule of Studies

The Bachelor of Science in Nursing degree requires a total of 120 semester hours. At least 60 of the total hours required for this degree must be in upper-division courses. All students must meet the General University Requirements for Graduation and departmental requirements which include (a) Arts and Humanities and Social Science: 21 hours with at least 6 hours in arts and humanities and 6 hours in social sciences; all courses must be outside the nursing major; (b) Communication Proficiency: 6 hours including 3 in written communication; (c) Sciences: 12 hours with at least 3 hours in the biological sciences and 3 hours in the physical sciences and 2 hours credit for 6 clock hours of laboratory work; courses must be outside the nursing major; and (d) Foreign Language: one year of foreign language if the student has not completed two years of one foreign language in high school.

A grade of C or better is required in all upper-division required nursing courses. Two non-nursing upper-division courses, a minimum of 2 hours each supportive to the nursing major are also required. Independent study and correspondence courses do not fulfill this requirement.

Freshman Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engl 101 Composition</td>
<td>3</td>
</tr>
<tr>
<td>Psych 101 Prin of Behavior</td>
<td>3</td>
</tr>
<tr>
<td>Chem 101 Introductory</td>
<td>4</td>
</tr>
<tr>
<td>Soc S or Hum Elective</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hum Elective</td>
<td>3</td>
</tr>
<tr>
<td>Soc 101 Introduction</td>
<td>3</td>
</tr>
<tr>
<td>Chem 102 Chem &amp; Man</td>
<td>4</td>
</tr>
<tr>
<td>Bio S 102 General</td>
<td>3</td>
</tr>
<tr>
<td>Com Prof Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

Sophomore Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zool 315 Human Anatomy</td>
<td>4</td>
</tr>
<tr>
<td>CFS 240 Dev &amp; Guidance</td>
<td>3</td>
</tr>
<tr>
<td>Bact 101 Elementary</td>
<td>4</td>
</tr>
<tr>
<td>Hum Elective</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zool 251 Human Physiol</td>
<td>4</td>
</tr>
<tr>
<td>HNF 233 Human Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>Elective</td>
<td>3</td>
</tr>
<tr>
<td>Soc S or Hum Elective</td>
<td>6</td>
</tr>
</tbody>
</table>

Junior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurs 305 Sci Con I</td>
<td>3</td>
</tr>
<tr>
<td>Nurs 306 Clin Nurs I</td>
<td>10</td>
</tr>
<tr>
<td>Supportive Course</td>
<td>2-3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurs 315 Sci Con II</td>
<td>4</td>
</tr>
<tr>
<td>Nurs 316 Clin Nurs II</td>
<td>12</td>
</tr>
<tr>
<td>Elective</td>
<td>2</td>
</tr>
</tbody>
</table>

Senior Year

<table>
<thead>
<tr>
<th>First Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurs 405 Intro Res Nurs</td>
<td>3</td>
</tr>
<tr>
<td>Nurs 406 Clinical Nurs III</td>
<td>12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Second Semester</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurs 416 Clin Nurs IV</td>
<td>12</td>
</tr>
<tr>
<td>Supportive Course</td>
<td>2-3</td>
</tr>
<tr>
<td>Nurs 499 Special Problems</td>
<td>1-4</td>
</tr>
</tbody>
</table>

Transfer Students

Students who plan to transfer to nursing at Washington State University from other insti-
tuitions should coordinate their program early with the nursing adviser on the Pullman campus to select courses that will be applicable to the degree requirements.

Registered nurses who plan to obtain their baccalaureate degree in nursing from Washington State University may obtain admission and curricular information from the nursing adviser on the Pullman campus. Upper-division nursing major requirements and policies pertinent to the registered nurse should be discussed with the nursing adviser at the center in Spokane.

Program in Nutrition

Graduate Faculty
Professor and Program Head, J. R. Carlson; Professors, D. C. Fletcher, J. A. Prostah, W. W. Heinemann, J. McGinnis, R. E. Wilson; Associate Professors, C. N. Coon, R. L. Kimaid, M. E. Mitchell, M. H. Pabols; Assistant Professors, L. Massey, T. Mehta; Adjunct Professor, C. G. King.

Associate Faculty
Associate Professors, G. K. Jennings, J. R. Males, B. G. Swanson; Assistant Professor, B. P. Chew.

The interdepartmental graduate program in nutrition is composed of faculty from the Departments of Animal Sciences, Food Science and Technology, and Human Nutrition and Foods in the College of Agriculture and Home Economics; and the Department of Veterinary Microbiology and Pathology in the College of Veterinary Medicine. The program offers courses of study leading to the degrees of Master of Science and Doctor of Philosophy in Nutrition. Graduate training in basic and applied nutrition of man and a variety of laboratory and domestic animals is available. Specific areas of research include nutrient availability, utilization and interactions; new food and feed sources; nutrition and disease; and nutritional status and requirements. Excellent facilities contribute to these teaching and research objectives, including extensive WSU central facilities.

Students wishing to pursue studies leading to advanced degrees in nutrition are encouraged to obtain undergraduate training in nutrition, biological sciences, chemistry (inorganic, organic, and quantitative), physics and mathematics. The Graduate Record Examination (GRE) and three letters of reference are required for admission. Students with bachelor's degrees in foods and nutrition and animal nutrition are usually well prepared for admission. Students from a wide variety of other fields may be admitted provided the necessary prerequisites are met. The interdisciplinary impact of other fields on nutrition encourages selection of courses in biochemistry, physiology, and biometry, as well as nutrition, to meet course requirements. A wide variety of additional graduate courses in agricultural, biological, social, and veterinary sciences are available to supplement the degree program. Doctoral students must select a collateral area that is related to but outside the field of nutrition.

Graduates will be prepared for careers in teaching, research, and extension at universities and for field representative and research positions in government, industry, and other organizations.

1 Associate faculty are interested persons who wish to formalize their association with the Nutrition Program prior to the time they are elected to membership of the Nutrition Program Graduate Faculty. They have most of the rights and privileges of graduate faculty except the responsibility of serving as chairperson of a doctoral committee.

2 Candidates for the Ph.D. degree may choose either a basic science or the social and behavioral science option.

Description of Courses

For explanation see Index under "Symbols"

Nutr
500 (502) Seminar in Nutrition 1 May be repeated for credit. Same as A S 500.
505 Experimental Nutrition 3 (1-6) Same as A S 505. (a/y)
510 Advanced Food Chemistry 3 Same as F S 510. (a/y)
511 Food Carbohydrates, Lipids, and Proteins 3 Same as F S 511. (a/y)
512 (501) Vitamins 2 Same as A S 512. (a/y)
514 (561) Energy Metabolism 3 Same as A S 514. (a/y)
516 (562) Protein and Amino Acid Metabolism 2 Same as A S 516. (a/y)
518 (523) Mineral Metabolism 3 Same as A S 518. (a/y)
521 Research Techniques in Nutrition 3 (1-6) Same as HNF 521.
Program in Pharmacology and Toxicology


The graduate Program in Pharmacology and Toxicology offers courses of study leading to the degrees of Master of Science and Doctor of Philosophy in Pharmacology and Toxicology. The program is an interdisciplinary and inter-institutional effort to provide trained professionals in the fields of pharmacology and toxicology. The breadth of the program permits degree candidates to work with Pharmacology/Toxicology faculty in the Colleges of Pharmacy, Veterinary Medicine, Agriculture, and Science and Arts at Washington State University and the Department of Veterinary Science at the University of Idaho.

The fields of pharmacology and toxicology are increasingly important to human health, food resources, and environmental quality. Attempts to characterize, understand, and regulate drugs, agricultural chemicals, and environmental pollutants have led to substantial demands for scientists with training in chemistry, biology, and biomedical sciences who will be instructed in basic pharmacology and toxicology and who will be trained in various areas of specialization. The program provides students with the necessary training to assess a broad range of toxicological and pharmacological information and to recognize the responsibilities and implications of the use of such information in making decisions regarding human and animal health, the environment, and food resources. Graduate faculty in the program represent a broad spectrum of pharmacologic and toxicologic studies, e.g., mutagenesis in plants, bacteria, or mammals; teratologic conditions in wildlife; residues in consumable foods; diagnostic and clinical veterinary toxicology; carcinogenic viruses; application of physicochemical methods basic to biomedical problems; central nervous system research; design of enzyme inhibitors; definition of the nutritional requirements for growth and inhibition of melanomas; the study of chronic, low-level toxic effects of cyanide in the environment; research on neurotransmitters; drug metabolism and drug biotransformations; and many others.

Much of the coursework and research which will occur in the pharmacology and toxicology program will take place in Wegner Hall. The newly remodeled facility houses the College of Pharmacy and the Department of Veterinary and Comparative Anatomy, Pharmacology, and Physiology of the College of Veterinary Medicine. The building is well equipped for graduate study and research. Among the specialized facilities and equipment are modern instrumentation for the determination of drug stability and the physical and molecular structure of organic compounds, laboratories for utilization of radioactive tracers in studying biosynthetic and biotransformation pathways, special equipment for the study of mechanisms of drug action in the central nervous system, a laboratory for biochemical pharmacology, laboratories for research in biopharmaceutics and an electron microscope. In addition, the building houses a health sciences area library and a vivarium for holding instruction and research animals. The shared facilities greatly enhance joint research projects, particularly between pharmacy and veterinary faculty members. Equally modern research facilities are used by adjunct faculty of the University of Idaho. Individual graduate students may also be located
in other laboratories within departments that are associated with the program.

Applications for admission to the Pharmacology and Toxicology program will be screened by the Chairperson and Policy Committee of the program. Applicants will generally be expected to have completed courses in analytical chemistry, calculus, physics, and a minimum of three courses in different areas of the biological sciences, including physiology, together with organic chemistry and biological chemistry. Deficiencies in these areas must be removed during the period of graduate study before the preliminary examination. There are no mandatory requirements for inclusion of a minor, and foreign languages are not required for completion of the program. However, regular participation in the Pharmacology and Toxicology Seminar will be required of all students in the program. All degree candidates are expected to conduct research and prepare a thesis or dissertation.

The program is divided into tracks depending upon the student's area of interest. The tracks consist of a required core of courses plus additional track requirements. The required core of courses consists of Chemical Pharmacology (Phar 471), Environmental and Comparative Toxicology (P/T 502), Biometry (Biom 412), P/T Seminar (P/T 504), and General Biochemistry (BC/BP 563, 564). Advanced Pharmacology/Toxicology (Phar 561) is required for students in the pharmacology track while Mechanisms of Selective Toxicity (P/T 503) is required for students in the toxicology track. In addition to the required core courses and the required track courses, the student and the student's committee will select elective courses from a wide variety of course offerings.

Course offerings for the program are distributed throughout the various participating disciplines. Detailed lists of required course work and electives are available from the chairperson of the program.

College of Pharmacy


The pharmacy curriculum is divided into five areas: pharmacy—the study of pharmaceutical dosage forms and the delivery of professional services in a clinical pharmacy program; pharmacological chemistry—the principles of chemistry applied to the problems of pharmacy; pharmacognosy—the study of drugs of natural origin; pharmacology—the study of the action of drugs; and pharmacy administration—the study of the business principles and laws of pharmacy.

Students may enroll in professional elective courses during the third and fourth professional years to prepare for specialized careers in professional, retail, or hospital pharmacy; detailing physicians on pharmaceutical products; teaching; research and development in industry; or government.

The College of Pharmacy is accredited by the American Council on Pharmaceutical Education and is a member of the American Association of Colleges of Pharmacy.

The College of Pharmacy offers courses of study leading to the degrees of Bachelor of Pharmacy, Master of Science in Pharmacology and Toxicology, and Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Pharmacy

Phar

101 Orientation 1 Open to all students.

217 Drugs in Our Society 2 For non-majors.

The use and abuse of drugs.

300 Pharmaceutical Calculations 1 The mathematics of pharmacy to meet the needs of dispensing practitioners.

310 The Pharmacist and Social Health 2 Prereq c/4 in Bact 101. The pharmacist's role in individual and group health problems.

311 Pharmacists 3 Prereq Chem 340.

Theory, preparation, and application of solution dosage forms.

312 Pharmacists II 3 Prereq Phar 311.

Theory, preparation, and application of solid, semisolid, and dispersed liquid dosage forms.

313 Pharmacists Laboratory I 1 (0-3)

Prereq Phar 311 or c/4. Laboratory in the preparation of solution dosage forms.
Pharmaceutics Laboratory II 1 (0-3) Prereq Phar 312 or c/./. Laboratory in the preparation of solid, semisolid, and dispersed liquid dosage forms.

Clinical Pharmacy 5 (4-3) Prereq Phar 406. Biopharmaceutics and pharmacology applied to clinical situations, drug information and evaluation; disease states.

Hospital Pharmacy 2 Prereq Phar 406 or c/./. By interview only. Responsibilities and services of institutional pharmacists in community hospitals: distribution systems, audits, standards, policies and procedures, and quality control.

Professional Practice 8 (0-24) Prereq Phar 406. An externship providing practical professional experience in various pharmacies under the supervision of an approved pharmacist preceptor.

Therapeutic Agents 3 (1-6) Prereq Phar 411, 436, 472. Professional competence in applying principles of pharmaceutics, medicinal chemistry and pharmacology to selecting therapeutic products; dispensing procedures; clerkship preparation.

Clinical Clerkship V 4 (0-12) or 8 (0-24) May be repeated for credit. Prereq Phar 406. Externship providing clinical experience in the delivery of health care and the role of the pharmacist in patient care.

Pharmaceutics III 3 Prereq Phar 312. Kinetics of drug absorption, distribution, and elimination; dosage regimen design; bio-availability.

Pharmaceutics Laboratory III 1 (0-3) Prereq Phar 312. Advanced techniques for the extemporaneous compounding of dosage forms; I.V. admixtures.

Biopharmaceutics 3 Prereq Phar 415. Dosage form evaluation as to the stability, availability, absorption, distribution, and excretion of drugs; allied analytical procedures.

Non-Prescription Drugs and Health Care Accessories 2 Prereq Phar 406. Quality and use of non-prescription drug items and selected health care products.

Drug Induced Diseases 2 Prereq Phar 406. Incidence, mechanisms, manifestations, treatment and/or prevention of drug induced diseases.

Advanced Pharmacy 3 Prereq Chem 331 or 371. Equilibrium and kinetic concepts applied to pharmaceutical systems.

Pharmacokinetics 3 Kinetics of drug absorption, distribution, elimination and pharmacologic response. (a/y)

Advanced Topics in Pharmaceutical Sciences 2 or 3 May be repeated for credit. Current research interest in pharmaceutic chemistry, pharmacognosy, and pharmacology.

Pharmaceutical Chemistry

Chemotherapy 3 Prereq Phar 310, 471; Bact 101. Structure-activity relationships, mechanisms of action, and pharmacology of antimicrobial and anticancer agents.

Pharmaceutical Analysis 3 (2-3) Prereq Chem 342. Procedures and instruments used in analytical and separation methods.

Continuation of Pharm 525.

Chemical Structure and Drug Action 3 Prereq 10 hrs Org Chem; Phar 471 or BC/BP 364. Theories of medicinal chemistry.

Chemical Structure and Drug Action 3 Prereq Phar 531. Effect of variation of structure on pharmacological properties of selected classes of medicinals.

Pharmacognosy


Pharmacognosy 4 Prereq Chem 342. Continuation of Phar 341. Poisonous plants; pharmaceutically important enzymes, vitamins, antibiotics, allergens, and biologicals.

Pharmacology

Toxicology 2 Prereq Phar 472 or c/./. Symptomatology, prevention, treatment, and demography of toxic reactions to drugs and household, agricultural, and economic poisons.


Chemical Pharmacology 4 Prereq BC/BP 364; Chem 342 or Phar 331; Zool
315, 353. Mechanisms of drug action and factors modifying drug responses; physiochemical properties of drugs; drug receptor interaction; development of drugs.

**472 Pharmacodynamics 5 Prereq Phar 471.** Pharmacology and medicinal chemistry of the classes of drugs.

**473 Pharmacology Laboratory 1 (0-3) Prereq Phar 411 or c//; Phar 472 or c//.** Drug pharmacodynamics and pharmacokinetics.

**529 Neurochemistry 3 Same as V Ph 529.**

**561 Advanced Pharmacology-Toxicology I 4 Prereq Phar 472.** Advanced concepts and applications of drug action. (a/y)

**562 Advanced Pharmacology-Toxicology II 3 Prereq Phar 561.** Continuation of Phar 561.

**Pharmacy Administration**

**Phar 482** Pharmacy Law 2 Laws relating to pharmacy and professional practice.

**Phar 484** Pharmacy Administration 3 Prereq Econ 201. Problems and procedures in the establishment and management of a pharmacy.

**Problems, Seminar, and Research and Thesis**

**Phar 499** Special Problems V 1-4 May be repeated for credit.

**598 Seminar I 1 May be repeated for credit.**

**600 Special Projects or Independent Study Variable credit.**

**700 Master's Research, Thesis, and/or Examination Variable credit.**

**702 Master's Special Problems, Directed Study, and/or Examination Variable credit.**

**800 Doctoral Research, Dissertation, and/or Examination Variable credit.**

**Schedule of Studies**

The Bachelor of Pharmacy degree requires a total of 156 semester hours. At least 80 of the total hours for this degree must be in upper-division courses.

**Prepharmacy Year**

**First Semester**

<table>
<thead>
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<th>Hours</th>
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<td>Bio 103 Introductory</td>
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<tr>
<td>Chem 105 Principles</td>
<td>4</td>
</tr>
<tr>
<td>Math 140 Math-Life Sci</td>
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</tr>
<tr>
<td>Hum or Soc S Elective</td>
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**Second Semester**

<table>
<thead>
<tr>
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<tr>
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<tr>
<td>Chem 106 Principles</td>
<td>3</td>
</tr>
<tr>
<td>Chem 107 Qualitative Analysis</td>
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<td>Com Proficiency</td>
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<td>Hum or Soc S Elective</td>
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**First Professional Year**

**First Semester**

<table>
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<td>Chem 240 Organic 3</td>
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<td>Bact 101 Elementary</td>
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**Second Semester**

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<tr>
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<tr>
<td>BC/BP 364 Biochemistry</td>
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<tr>
<td>Econ 201 Principles 2</td>
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<tr>
<td>Phar 300 Phar Calculations</td>
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<td>Phar 331 Org Med Chem 3</td>
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<tr>
<td>Elective</td>
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**Second Professional Year**

**First Semester**

<table>
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<th>Hours</th>
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<tbody>
<tr>
<td>Phar 311 Pharmaceutics I</td>
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<tr>
<td>Phar 313 Pharmaceutics Lab I</td>
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<tr>
<td>Phar 341 Beg Pharmacognosy</td>
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</tr>
<tr>
<td>Zool 315 Gross/Micro Anat</td>
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<td>Phar 467 Human Path</td>
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**Second Semester**

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<td>Phar 342 Pharmacognosy</td>
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<td>Phar 471 Chem Pharmacology</td>
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<td>Zool 353 Zoophiology</td>
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**Third Professional Year**

**First Semester**

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<td>Phar 411 Pharmaceutics III</td>
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<td>Phar 413 Pharmaceutics Lab III</td>
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<td>Phar 436 Chemotherapy</td>
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<tr>
<td>Phar 464 Toxicology</td>
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<tr>
<td>Phar 472 Pharmacodynamics</td>
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<td>Phar 473 Pharm/Biopharm Lab</td>
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**Second Semester**

<table>
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<th>Course</th>
<th>Hours</th>
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<tr>
<td>Phar 406 Therap Agents</td>
<td>3</td>
</tr>
<tr>
<td>Phar 401 Clinical Phar</td>
<td>5</td>
</tr>
<tr>
<td>Phar 482 Pharmacy Law</td>
<td>2</td>
</tr>
<tr>
<td>Phar 484 Phar Administration</td>
<td>3</td>
</tr>
<tr>
<td>Phar 417 Drugs Accessories</td>
<td>2</td>
</tr>
<tr>
<td>Elective 1</td>
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</table>

**Fourth Professional Year**

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>Electives (professional and non-professional) 1</td>
<td>16</td>
</tr>
</tbody>
</table>
Second Semester
Phar 408 Clinical Clerkship 8
Phar 405 Prof Practice 8

1 Students must complete a total of 28 hours in non-science, non-professional course work prior to graduation. This total will include the six hours of communication proficiency and the required economics course as well as the GURs in humanities or social sciences.

2 Econ 203 acceptable if Econ 201 cannot be scheduled.

3 Students may substitute Chem 340, 341, 342, 343 for the Chem 240/Phar 331 sequence.

Department of Philosophy

Professor and Department Head, J. C. Carloye; Professors, D. H. Bishop, J. E. Brayles, H. S. Silverstein; Associate Professors, G. W. Lilje, M. R. Neville; Assistant Professor, M. T. Ferejohn.

The Department of Philosophy offers courses intended to provide the student with an introduction to fundamental intellectual problems, and both classical and contemporary attempts at their solutions. Students are encouraged to develop their own critical faculties.

The department offers courses of study leading to the degrees of Bachelor of Arts in Philosophy and Master of Arts in Philosophy. The department is not accepting applications for the MA program at this time.

Description of Courses

For explanation see Index under “Symbols”

Phil
101 [H] Introduction to Philosophy 3 Nature and place of philosophy in human thought; problems and achievements.
107 [H] Philosophy of Religion 3 Western religious thought, nature and knowledge of God, relations to science, morality, and society.
198 [H] Philosophy Honors 3 The nature of formal arguments; principles of scientific inquiry.
201 [H] Elementary Logic 3 Analysis and evaluation of deductive and non-deductive argument.
220 [H] Aesthetics 3 Philosophy of art; analysis of aesthetic experience; criteria of art criticism. (a/y)
260 [H] Ethics and Contemporary Social Issues 3 Ethics through analysis of contemporary moral and social issues.
300 [H] History of Ancient and Medieval Philosophy 3 Pre-Socratics, Plato, Aristotle; post-Aristotelian philosophy to the Renaissance. (a/y)
305 [H] History of Modern Philosophy 3 Renaissance; 17th and 18th century philosophers. (a/y)
310 [H] Recent and Contemporary Philosophy 3 19th and 20th century philosophers. (a/y)
314 [H] Philosophy and Religion of India 3 Prereq 3 hrs Phil. The metaphysical, epistemology, ethics, aesthetics and social philosophy of Hinduism, Buddhism, Islam and other schools of thought. (a/y)
315 [H] Philosophy and Religion of China and Japan 3 Prereq 3 hrs Phil. Confucianism, Taoism, Shintoism, and Mahayana Buddhism dealt with historically and in terms of central beliefs. (a/y)
320 (415) Seminar on Analytic Philosophy 3 Prereq 3 hrs Phil. The analytic tradition: Moore, Wittgenstein and others; language in philosophical problems. (a/y)
335 (435) Seminar in Theory of Knowledge 3 Prereq 3 hrs Phil. Problems of immediate knowledge and mediate knowledge, modes of cognition. (a/y)
340 (440) Seminar in Metaphysics 3 Prereq 3 hrs Phil. Theories of self, world, God, nature of being. (a/y)
401 Seminar in Symbolic Logic 3 Prereq Phil 201. (a/y)
407 Seminar in Religious Studies 3 May be repeated for credit; cumulative maximum 6 hours. Senior seminar for majors in religious studies.
410 Seminar in Philosophy of Language 3 Prereq 3 hrs Phil. Concepts of meaning, reference, linguistic knowledge; solution of related philosophical problems. (a/y)
420 Existentialism 3 Prereq 3 hrs Phil. The movement of religious and non-religious existentialism beginning with Kierkegaard and Nietzsche, and including Heidegger, Sartre, Merleau-Ponty, Buber and Tillich. (a/y)
425 Seminar in Philosophy of Science 3 Prereq 3 hrs Phil. Purpose and logical
structure of science; human implications. (a/y)

430 Philosophy of Literature 3 Prereq 3 hrs Phil. Nature of literary work of art; principles of literary criticism and evaluation.

436 Seminar on American Philosophy 3 Prereq 3 hrs Phil. Classical American philosophers; the pragmatists, Peirce, James, and Dewey. (a/y)

445 Seminar on Social and Political Philosophy 3 Prereq 3 hrs Phil. Problems of normative social and political theories; historical and contemporary philosophers. (a/y)

450 (550) Seminar in Philosophical Psychology 3 Prereq 3 hrs Phil. Theories of mind, self, mental acts, psychological states and human actions. (a/y)

455 (510) Seminars on Philosophical Issues 3 May be repeated for credit. Prereq 3 hrs Phil.

460 Seminar on Ethical Theory 3 Prereq 3 hrs Phil. Problems on ethical theory, historical and contemporary philosophers. (a/y)

499 Special Problems V 1-4 May be repeated for credit.

511 Seminar in Theory of Logic 3 Prereq Phil 201; 9 hrs Phil. (a/y)

516 Seminar on Philosophy of Mathematics 3 Prereq Phil 401, 415 or 9 hrs Phil. Rival interpretations concerning concepts, structure, and nature of mathematics. (a/y)

600 Special Projects or Independent Study Variable credit.

Schedule of Studies

At least 40 of the total hours required for the bachelor’s degree in this program must be in upper-division courses.

An undergraduate major consists of 30 hours within the department including Phil 101, 201, 300, 305, 310; 335 or 340; 445 or 460; and 9 hours electives. Students intending to use the philosophy major as a pre-law or pre-theology program should consult with the department about particular course concentrations.

The undergraduate minor consists of 16 hours of course work, at least 8 of which must be in upper-division courses. Courses are chosen by the student, but normally include Phil 101 and 201.

Departments of Physical Education for Men and Women

**Physical Education for Men**


**Physical Education for Women**

Professor and Department Head, C. E. Gordon; Professors, M. Adrian, M. L. Enberg; Associate Professors, D. Albright, S. Durrant, G. Hulac, M. Mowatt, W. Weaver; Assistant Professors, M. Bayless, A. Brown, D. Burtz, T. Coblentz, K. Depauw, K. Kolyn, C. Laublin, S. Moore, D. Pipher, A. Sanders, D. Strong, W. Zietz.

The Departments of Physical Education for Men and Women unite the interests of the following areas; professional physical education for the teacher and coach, the elective activity programs for all students, professional recreation and leisure studies, intramural programs, sports management, and health education.

**PHYSICAL EDUCATION**

The physical education curriculum is designed to provide a solid professional preparation for future teachers of physical education and for those wishing to assume positions in sports management. Students majoring in elementary education may also take physical education as their area of subject-matter concentration. Students majoring in secondary physical education may obtain K-12 certification by taking additional courses PEP 354, 379, 380, 383, 389.

**Physical Education Majors**

**Senior or Junior High School Major**

30 hours minimum

**Core Courses:** PEP 104, 199, 261, 313, 362, 382, 463, 465, 482, 494, H Ed 363; **Course Work or Competency in:** (total 8 credits) 5-8 credits from PEP 113, 114/115, 116/117, 121/120, 124, 125/126, 127/118/119; 0-3 credits from approved activities. 4 credits from minimum of two areas: PEP 314, 316/317, 320, 324, 393. Zool 231 is prerequisite for
PEP 465. An approved teaching minor is required for teacher certification. If a coaching minor is selected, students are strongly urged to select a second minor in an unrelated field.

**Physical Education Minors**

1. **Senior or Junior High School Physical Education:** 20 hours minimum
   20 hours minimum
   PEP 261, 313, 362, 382, H Ed 363; plus 4 courses from PEP 100-200-level activity courses; MPE/WPE 235, plus 2 courses from PEP 314, 316, 317, 320, 324, 393. If courses are waived, an equivalent number of credits must be chosen. The physical education minor must be approved by the Departments of Physical Education.

2. **Coaching:** 21 hours
   Spe 102; PEP 220, 266, 330 or 465, 488, 489, plus 6 hours selected from PEP 200-212, 300-312, 393. PEP 390 may be substituted for one PEP 300-312 course. A coaching minor must be approved by the Departments of Physical Education.

3. **Health Education:** 18-20 hours
   H Ed 361, 383, 480 or 481; Psych 102; one course from each of the following groups: HNF 130, Env S 101; CFS 247, Psych 230, or Soc 150; Phar 217, 417, or Psych 365.

**Options and Concentrations**

(May not be substituted for a teaching minor but may be combined with the above majors and minors with departmental approval):

1. **Dance:** 20 hour minimum
   PEP 116, 117; 316 or 317; or PEP 354, 257, 261, 362, plus 5 hours from: MPE/WPE 120, 212, 123, 124, 127, 227, 279, PEP 354, 327, 340, 355, 356, 499. Must be approved by the department.

2. **Aquatics:** 20-23 hours
   Contact department for course requirements.

3. **Athletic Training:** 55-61 hours
   Psych 101; Soc 101; HNF 130; Zool 251; PEP 261, PEP 266; H Ed 363, 361; PEP 362, 382, 463, 465, 466, 499; plus 4 hours selected from: Bact 101, Spe 112, Phar 217, PEP 300-312. The option must be approved by the department; students are admitted by screening procedure.

4. **Elementary Physical Education**
   (for students majoring in Elementary Education)

5. **Sports Management Option:** 53 hours
   PEP 104; PEP 199 or RLS 275; PEP 261, 313, 362, 465, 482, 494; H Ed 363; RLS 285, 375; PEP 488 or RLS 481; P R 312 or Adver 280; PEP 487, 389, 390, 490; RLS 489; plus 25 hours from competency areas.

6. **Exercise Science Option:** 29 hours
   PEP 113, HNF 130, Mgr 201, H Ed 361, RLS 241, Psych 363, PEP 390, RLS 489.

**RECREATION AND LEISURE STUDIES**

_D. Albright, D. Burtz, Coordinators_

The Recreation and Leisure Studies curriculum is designed to provide professional recreation preparation in five areas: commercial recreation, park administration, program supervision, therapeutic recreation and sports management. The major in RLS must complete a core program of general education and professional recreation and park requirements, in addition to completing option requirements in the areas of his/her choice. In numerous courses, theory and practice are integrated in preparation for the field work experience. A total of 1000 hours of practical experience is required for all majors.

1. **Commercial Recreation**
   RLS 341; Acctg 230; Mktg 360; P R 312; RLS 487; at least 24 hours from at least six competency areas.

2. **Park Administration**
   L A 264; L A 363 or RLS 373; P R 312; RLS 475; FRM 412; at least 24 hours from at least six competency areas.

3. **Program Supervision**
   RLS 388; Psych 360; Acctg 230; P R 312; RLS 487; at least 24 hours from at least six competency areas.

4. **Therapeutic Recreation**
   RLS 383, 388, 460, 483; PEP 463; Phar 217; Psych 333; Psych 360 or S W 394; Soc 356, 361; at least 15 hours from at least four competency areas.

5. **Sports Management**
   PEP 104; PEP 199 or RLS 275; PEP 261, 313, 362, 465, 482, 494; H Ed 363; RLS 285, 375; PEP 488 or RLS 481; P R 312
or Adver 280; PEP 487, 389, 390, 490; RLS 489; plus 25 hrs from competency areas.

A major in the Recreation and Leisure Studies curriculum may secure a second degree and qualify for a teaching certificate by completing the subject matter requirements for physical education, the requirements of the Department of Education, and presenting not less than 150 semester hours.

**Degrees**

The departments offer courses of study leading to the degrees of Bachelor of Science in Physical Education, Bachelor of Arts in Recreation and Leisure Studies, Master of Science in Physical Education, and Doctor of Philosophy.

**Description of Courses**

*For explanation see Index under "Symbols"*

**Activity Courses**

Courses numbered 101 through 174 are for beginners. Courses numbered 177 through 276 are for intermediate or advanced students.

Activity course credit is granted on the basis of one credit for two one-hour classes per week. MPE/WPE courses may not be repeated for credit.

**MPE/WPE**

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<tr>
<td>Out-of-season conditioning</td>
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<tr>
<td>for varsity sport</td>
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<tr>
<td>participants and other</td>
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<td>interested students.</td>
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<td>Beg Tumbling</td>
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<td>Beg Gym App</td>
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<td>Int Folk Dance</td>
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<td>West Sq Dance</td>
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<td>Beg Mod Dance</td>
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<td>Beg Jazz Dance</td>
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<td>Diving</td>
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<td>Scuba Diving</td>
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<td>Special Topics</td>
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<td>Beg Archery</td>
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<td>Track Events</td>
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<td>Field Events</td>
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<td>Jogging</td>
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<td>Beg Golf</td>
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<td>Beg Bowling</td>
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<td>Beg Fencing</td>
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<td>Beg Handball</td>
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<td>Beg Badminton</td>
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<td>Beg Tennis</td>
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<td>Pocket Billiards</td>
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<td>Beg Racquetball</td>
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<td>Beg Basketball</td>
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<td>Beg Volleyball</td>
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<td>Beg Soccer</td>
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<td>Beg Valleyball</td>
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<td>Tech Officier</td>
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12 credits

WPE only

MPE only

**Professional Courses**

PEP

113 Fitness 2 (1-3) Introduction to skills and progressions in fitness.

196 Tumbling and Trampoline 1 (0-3) Skills and techniques in trampoline, floor exercise plus teaching methods and spotting.

197 Gymnastics Apparatus 1 (0-3) Skills and techniques in pommel horse, rings, vaulting, parallel bars, horizontal bars and spotting.

196 Introduction to Recreational Dance 2 (1-3) Same as RLS 116.

115 Modern/Ballet/Jazz 2 (1-3) Introduction to skills and progressions in modern/ballet/jazz dance.

118 Track 1 (0-3) Introduction to skills and progressions in track.

119 Field Events 1 (0-3) Introduction to skills and progressions in field events.

120 Tennis 1 (0-3) Introduction to skills and progressions in tennis.

121 Badminton 1 (0-3) Introduction to skills and progressions in badminton.

122 Golf 1 (0-3) Introduction to skills and progressions in golf.

123 Bowling 1 (0-3) Introduction to skills and progressions in bowling.

190 Field Sports 1 (0-3) Techniques, individual and team tactics, and officiating.

191 Volleyball 1 (0-3) Techniques individual and team tactics, and officiating.
126 (192) Basketball 1 (0-3) Techniques, individual and team tactics, and officiating.

127 (193) Softball 1 (0-3) Techniques, individual and team tactics, and officiating.

199 Disciplines of Human Movement 2 For freshmen and sophomores only. Related areas of prephysical therapy and coaching.

200-211 Advanced Skills and Techniques of Sports 1 (0-3) Fundamental skills; advanced skills and techniques in selected sports.
200 Baseball 206 Softball
201 Basketball 207 Tennis
202 Field Events 208 Track Events
203 Football 209 Volleyball
204 Gymnastics 210 Women's Gymnastics
205 Soccer 211 Wrestling

220 Officiating V 1-2 May be repeated for credit; cumulative maximum 4 hours.

257 Theory of Dance 2 Historical background; philosophy.

261 Anatomy 3 (2-3) Human skeletal structure and articulations; skeletal musculature; the nervous and circulatory system.

266 Care and Prevention of Athletic Injuries 2 (1-3) Prereq PEP 261 or 330.

290 Intramural Administration 2 (1-3) Philosophies and program content of intramurals at public schools and colleges. Laboratory experiences in WSU intramural program.

300-312 Coaching of Sports 1 Theory and strategy of coaching selected sport areas.
300 Baseball 308 Track and Field
301 Basketball 309 Volleyball
303 Football 310 Women's Gymnastics
304 Men's Gymnastics 311 Wrestling
305 Soccer 312 Swimming

302 Pool Maintenance and Operation 1 Prereq adv swimming or equivalent. Information and practice for managers and maintenance specialists in infiltration, pool operation, tests and records, organization and administration of personnel.

313 Motor Skill Acquisition 2 (1-3) Prereq 4 hrs PEP 100-level skills classes. The learner as an input-integration-output-feedback system; implications for the acquisition of perceptual and motor skills in the schools.

314 Advanced Analysis of Performance in Individual Sports V 1-2 May be repeated for credit; cumulative maximum 4 hours. Prereq appropriate 100-level skills class or competency exam; PEP 313. Analysis of performance with implications for teaching of selected motor activities: track, field events, tumbling, apparatus.

316 Recreational Dance for the Teacher V 1 (0-3) or 2 (0-6) Same as RLS 316.

317 Modern/Jazz/Ballet V 1 (0-3) or 2 (0-6) Prereq PEP 117 or competency; PEP 313. Methods and materials for the teaching of modern dance, jazz dance, and ballet.

320 Advanced Analysis of Performance in Recreational Sports V 1-2 May be repeated for credit; cumulative maximum 4 hours. Prereq appropriate 100-level skills class or competency exam; PEP 313. Analysis of performance with implications for teaching of selected motor activities: tennis, badminton, golf, bowling, lifetime sports.

324 Advanced Analysis of Performance in Team Sports V 1-2 May be repeated for credit; cumulative maximum 4 hours. Prereq appropriate 100-level skills class or competency exam; PEP 313. Analysis of performance with implications for teaching of selected motor activities: field sports, volleyball, basketball, softball.

327 Dance/Movement Therapy 2 (1-3) Prereq Psych 101 or 102. Theories, methods, and practice in dance/movement therapy. (a/y)

330 Biological and Mechanical Aspects of Sports 3 Anatomy, physiology, psychology of exercise, and kinesiology; practical applications to coaching situations.

340 [H] Chicano Dance and Theater 2 Same as Ch St 340.

354 Creative Rhythms for Children 2 (1-3) Not open to freshmen or first semester sophomores. Rhythmic activities used by elementary school teachers.

356 Advanced Modern Dance Composition and Choreography 1 (0-3) May be repeated for credit; cumulative maximum 3 hours. Solo and group dances in modern dance idiom for performance and production.

362 Kinesiology 3 (2-3) Prereq PEP 261.

379 Physical Education for Primary Grades
2 (1-3) For elementary education majors. Materials and methods of primary physical education instructors.

380 Physical Education for Intermediate Grades 2 (1-3) For elementary education majors. Materials and methods of intermediate physical education instructors.

382 Secondary Physical Education Programs 4 (3-3) Prereq PEP 313, 300; major or minor in PE. Methods, materials and directed teaching in secondary school physical education activities.

383 Motor Learning, Development, and PE Curriculum 4 Prereq PEP 379, 380 or C/1. Physical education principles and curriculum related to elementary schools; trends in motor learning/development: theories, programs, and movement education.

389 Practicum in Elementary School Physical Education 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 4 hours. Prereq PEP 379 or 380. By interview only. Supervised practicum in an established elementary physical education program.

390 Practicum in Athletic Coaching 1 (0-3) to 2 (0-6) May be repeated for credit; cumulative maximum 6 hours. By interview only. Supervised practicum in an established public school or college athletic program.

393 Methods of Water Safety Instruction 2 (1-3) Prereq MPE/WPE 235. Red Cross water safety certificates awarded to those who qualify.

400 Conditioning for Maximal Performance 1 or 2 Prereq PEP 382 or teaching experience. Conditioning principles and programs related to the development of maximal performance; weight and flexibility training, general cardiovascular and cardiorespiratory conditioning.

420 Advanced Basketball Officiating 1 or 2 Prereq PEP 220 or officiating experience. History, philosophy, and advanced techniques of basketball. For those with basic knowledge of basketball officiating.

433 Aquatic Programs 2 Prereq PEP 393 or WSI certification. Aquatics, organization and administration.

460 Therapeutic Recreation for Afflicted and Handicapped Populations 3 Same as RLS 460.

461 Advanced Human Anatomy 2 (1-3) May be repeated for credit. Prereq PEP 261. Regional dissection and study of gross anatomical body parts.

463 Physical Education for the Handicapped 2 or 3 (2-3) Prereq for PE majors— PEP 382 or 383; for Educ majors— Educ 303 or 320; for RLS majors—RLS 383. Individual differences as they relate to physical education.

464 Physical Therapy Clinical Experience 2 (1-3) Prereq PEP 362. Physical therapy experience in a clinical setting; materials and programming on use of modalities, therapeutic exercise, and reporting and medical writing.

465 Physiology of Exercise 3 (2-3) Prereq PEP 261; Zool 251.

466 Advanced Athletic Training 1 May be repeated for credit; cumulative maximum 4 hours. Advanced care and prevention of athletic injuries.

473 Developing Individual Education Programs 1 Developing programs for the handicapped and normal population based on needs and abilities.

474 Assessment of the Exceptional Child 1 Tests and measures to determine the motor level and skill capabilities of handicapped children.

475 Activities and Programs for Exceptional Children 1 Practical adaptation of games and activities for exceptional children in the regular physical education class.

482 Principles of Physical Education 3 Prereq PEP 382. Concepts and principles which give meaning to physical education with the social and educational matrix.

487 Facilities and Equipment for Physical Education, Recreation, and Athletics 2 or 3 Credit not granted for both PEP 487 and 587.

488 Administrative Problems in Coaching 2 Administrative problems in coaching in school athletic programs based upon accepted education policies.

489 Behavior Aspects of Sports 3 Sociological and psychological factors inherent in the coaching of sports.

490 Instructional Practicum V 1-4 May be repeated for credit; cumulative maximum 6 hours.

494 Evaluation in Physical Education 3 (2-3)

496 Senior Seminar 1 Prereq senior standing.

499 Special Problems V 1-4 May be repeated for credit.
501 Current Topics in Physical Education, Recreation, and Athletics 1-3 May be repeated for credit; cumulative maximum 6 hours credit. Contemporary topics of current interest to graduate physical education, recreation, and athletic students and professional personnel.

511 Health and Medical Aspects of Sport 1 or 2 Prereq coaching minor certification and teaching experience. Medical supervision, first aid, nutrition, conditioning policies, relationships with health service, legal implications, effects of competitions and care of injuries.

512 Facilities and Equipment in Athletics 1 or 2 Prereq teaching experience. Newer concepts in school sports facilities, modifying present facilities, educational specifications for facilities, evaluation of athletic facilities.

513 School Law and Athletics 1 or 2 Prereq teaching experience. Personal and institutional liability, transportation of athletes, insurance coverage, legal responsibilities associated with Title IX, sports injuries; case studies.

514 Public Relations in Athletics 1 or 2 Prereq teaching experience. Working with the media, audio-visual and oral and written techniques for good public relations.

515 Assessment of the Athletic Programs and Personnel 1 or 2 Prereq teaching experience. Assessment of the total athletic program, individual sport programs and personnel involved: athletic directors, head coaches, assistant coaches, and officials.

516 Athletic Programs Administration 1 or 2 Prereq teaching experience. Athletic event management, tournament, officiating; interrelations of men’s and women’s programs; Title IX implications, business and accounting procedures.

517 Applying Scientific Principles to Improving Performance 1 or 2 Prereq teaching experience. Scientific knowledge relating to improving athletic performance; analysis of coaching methods and individual techniques; field of exercise physiology, biomechanics and coaching theory.

518 Psychological and Sociological Aspects of Sport 1 or 2 Prereq teaching experience. Methods of working with athletes and athletic teams; individual athletes and groups as they relate to their own development.

564 Mechanical Analysis of Motor Activity 3 Prereq PEP 362 or Phys 101. Fundamental laws of mechanics applied to motor activities.

565 Advanced Physiology of Exercise 2 Prereq PEP 465. Metabolic adjustment made in response to exercise and training with major emphasis upon research findings.

566 Biomechanics 3 (2-3) Prereq PEP 564; Math 202; Phys 102. Biological and mechanical aspects of human movement.

573 Philosophical Perspectives in Physical Education 2 or 3 Contemporary philosophies with implications for objectives, methodology, and course content.

575 Physical Education Programs for Junior and Senior Colleges 3 Prereq PEP 482. Professional, required, intramurals, adaptive, research, and recreational-type programs for general education and professional physical education students.

578 Sports in Society 3 The social significance of sports as viewed from a physical education perspective; sociology of sport research.

579 Psychology and Physical Activity 3 Prereq Psych 321 or 350. Current research findings in psychology pertinent to the teaching and coaching of physical activity.

582 Teaching of Physical Education Activities 1 May be repeated for credit; cumulative maximum 2 hours. Improvement of instruction in physical education classes through the application of current learning theories and teaching strategies.

585 Physical Education Curriculum 2 or 3 Principles of constructing and evaluating the physical education curriculum of public schools.

586 Administrative Perspectives in Physical Education and Recreation 2 or 3 The physical educator and recreation manager as a democratic leader and executive in the educational and community based program.

587 Facilities and Equipment for Physical Education, Recreation, and Athletics 2 or 3 Graduate level counterpart of PEP 487; additional requirements. Credit not granted for both PEP 487 and 587.

589 (597) Research Lab Techniques 2 (1-3) or 3 (2-3) Application and use of lab-
oratory research equipment in physical education.
590 Internship V 3 (0-9) to 6 (0-18) may be repeated for credit; cumulative maximum 12 hours. By interview only. Internship in educational, industrial, municipal or private sports or recreational setting; direct participation in tasks, research and reporting activities.
591 Motor Learning 3 Prereq Psych 101; Zool 251. Exploration of learning theory, learning models, and experimental evidence related to learning of perceptual-motor skills.
592 Perceptual Motor Development 3 Physical growth and perceptual-motor development from the prenatal period through senescence.
593 Methods of Research, Experimental Design and Data Analysis 3
596 Seminar 2 May be repeated for credit.
600 Special Projects or Independent Study Variable credit.
700 Master's Research, Thesis, and/or Examination Variable credit.
702 Master's Special Problems, Directed Study, and/or Examination Variable credit.
800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Health Education

H Ed
361 Contemporary Health Issues 3 Current topics with implications for the development and maintenance of a high level of well-being.
363 First Aid 2 (1-3) Advanced first aid; accident prevention. Option for instructor's card available.
383 School Health Instruction 3 Prereq H Ed 361, Educ 303 or 305 or c/-. Methods, materials, and resources.
480-1 School Health Programs 2 Prereq Educ 303, 305, 306. Philosophy, principles, and practices.
490 Instructional Practicum V 1-4 Same as PEP 490.
499 Special Problems V 1-4 May be repeated for credit.

Recreation and Leisure Studies

RLS
116 (151) Introduction to Recreational Dance 2 (1-3) Techniques of folk, square, and social dancing.
221 Camp Counselor Education 2 (1-3) Techniques in outdoor living and camp counseling.
275 Recreation in America 2 The recreation movement in America; history, philosophies, trends; socio-economic values; professional recreation within governmental and nongovernmental agencies.
285 Recreation Leadership 2 Prereq RLS 275. Theories and techniques of the leadership process as related to recreation personnel.
290 Intramural Administration 2 (1-3) Same as PEP 290.
310 Outdoor Recreation 3 (2-3) Backpacking, survival training, white water floating; skills, programming, safety factors. Field trip required.
316 (351) Recreation Dance for the Teacher V 1 (0-3) to 2 (0-6) Prereq RLS 116 or competency; PEP 313. Methods and materials for social, folk, and square dancing.
327 Dance Movement Therapy 2 (1-3) Same as PEP 327. (a/y)
341 Commercial Recreation 3 Prereq Acctg 230. Overview of organization and function of commercial and industrial recreation; commercial goods and services offered in leisure market.
371 Wildland Recreation 3 Same as FRM 371.
373 Interpretive Techniques 3 (2-3) Same as FRM 373.
375 Recreation Programs 3 Prereq RLS 285; major in RLS. Principles, methods, and materials for recreation programs in a variety of recreation and park settings.
380 Physical Education for Intermediate Grades 2 (1-3) Same as PEP 380.
383 Therapeutic Recreation Service 2 Prereq RLS 285. The rationale for therapeutic recreation delivery systems and services and their relationships to the treatment setting.
388 Park and Recreation Maintenance Management 3 Problems, methods, and techniques of maintenance in recreation and park facilities for governmental and private agencies.
389 Practicum in Recreation and Park Services V 1 (0-3) to 2 (0-6) May be repeated for credit; cumulative maximum 8 hours. Prereq RLS 285. By interview only. Supervised practicum in commu-
nity recreation and park programs.

435 Outdoor Living and Camp Counseling
6 Prereq upper-division or graduate students.

460 Therapeutic Recreation Practices and Procedures 3 Prereq RLS 383. Disabling
diseases, injuries and afflictions of the ill and handicapped; implications for
recreation program planning and delivery.

464 Recreation for the Handicapped 3 Prereq upper-division or graduate students.

471 Wildland Recreation Management 3
(2-3) Same as FRM 471.

475 Planning and Marketing of Leisure 3
(2-3) Prereq RLS 375, 388. Process of
financing, managing, and marketing of
leisure services.

481 Recreation and Park Administration 3
Prereq RLS 375. Principles underlying
the organization, supervision, and
administration of delivery systems; re-
view of economic, political, social, and
and cultural factors influencing delivery.

483 Seminar in Therapeutic Recreation 1
Prereq RLS 275, 285, 375, 383. Major
trends and issues in therapeutic recrea-
tion; leisure counseling, needs of spe-
cific populations, new techniques.

487 Facilities and Equipment for Physical
Education, Recreation, and Athletics 2
or 3 Same as PEP 487.

488 Current Trends in Parks and Recreation
1 Prereq RLS 275, 375, 475. Current
trends and issues in parks and recrea-
tion; participation, resources, and de-
velopment.

489 Field Work V 8-12 Prereq RLS 389/
490; RLS 481; 1,000 hours practical ex-
perience. For RLS majors. RLS prob-
lems and practices. Supervised practi-
cum in an established recreation or
park agency.

490 Instructional Practicum V 1-4 Same as
PEP 490.

499 Special Problems V 1-4 May be repeat-
ed for credit.

Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in these programs must be in
upper-division courses.

PHYSICAL EDUCATION FOR
MEN AND WOMEN

Majors preparing to teach should consult the
catalog listing of the Department of Education
for certification requirements and must take
H Ed 480 or 481.

Professional Core Requirement

A. PEP 104 Art Sci Move 1
PEP 199 Disciplines of PE 2
PEP 261 Anatomy 3
PEP 313 Motor Skills 2
PEP 362 Kinesiology 3
PEP 382 Secondary Sch Prog 4
PEP 465 PE Handicap 2-3
PEP 495 Physiol of Exer 3
PEP 482 Principles of PE 3
PEP 494 Tests and Measurements 3
PEP 496 Seminar 1
Zool 251 Intro Hum Physiol 4

B. 5-8 credits from PEP 113, 114/115, 116/
117, 121/120, 124, 125/126, 127/118/
118; 3 credits from approved activities.

C. 4 credits from minimum of two areas:
PEP 314, 316/317, 320, 324, 393.

RECREATION AND LEISURE STUDIES

At least 40 of the total hours required for the Bachelor of Arts degree in Recreation and
Leisure Studies must be in upper-division courses.

Recreation Core: Students must complete gen-
eral education and professional recreation core
requirements as well as requirements of one
option.

General Education: 9 hours from selected
GURs: Soc 101, Psych 101/102, Soc 102,
selected sciences depending upon option.

Professional Recreation and Leisure Studies
Core: 46 hours
RLS 275, 285, 321, 341, 375, 383, 388,
389/390, 475, 481, 483, 487, 488, 489;
H Ed 363

OPTION I. COMMERCIAL/INDUSTRIAL—
40 hours
Designed to provide an understanding of the
operation and management of commercial/
industrial recreation enterprises.
Mgt 301 Prin Mgt Org 3
B Law 210 or Ins 320 3
6 hours from Accng 230, Ins 320, Mgt
340, 401, Mktg 360, 367 6
Cpt S 140 or 150, 151 3-4
FS 170, 270 or HNF 220 3
H A 235 or 280 3
Econ 102, 201 or Spe 331 3
Psych 102, 306 or 350 3
Soc 102, 270, 320, 342, or 373 3

276
Transfer Students

Transfer students should note the sequence of professional requirements in specialized areas. For information regarding acceptability of professional courses taken at other institutions, prospective students should communicate with the department chair.

Preparation for Graduate Study

For admission to graduate study in physical education, a student should have a bachelor's degree and should present evidence of proficiency in academic work. Normally the applicant should have an undergraduate major in physical education or recreation and park administration; however, candidates with a good record in related fields may be well prepared for certain areas of advanced study in physical education.

Department of Physics


Physics is sometimes defined as the science of matter and energy and the interaction between the two. In any case it is the study of nature at its most fundamental level. As such it is the science upon whose principles all of the other sciences, as well as the technologies, are based. Because it is so basic, a major in physics is ideal preparation, not only for further study in physics, but also for advanced study in such diverse fields as biophysics, medicine, astrophysics, geophysics, chemical physics, engineering, meteorology, and computer science. These same areas also offer careers for the physics major.

Courses offered by the physics department are designed to introduce the student to each of the major physical theories. Additional undergraduate courses use these theories to investigate such topics as optics, atomic physics, nuclear physics, solid state physics, astrophysics and geophysics. In well-equipped laboratories the student tests the theories and learns some of the standard experimental techniques need-
ed to work with modern apparatus such as computers, high-vacuum equipment, lasers, electronic devices, and accelerators.

Active research programs, supported in part by U.S. Government grants and contracts, are being pursued in the following fields: acoustics (radiation pressure and scattering); astronomy (luminosity calibration, spectroscopy, statistics); nuclear physics (meson capture and nuclear absorption phenomena, properties of solid dielectric track detectors); optics (scattering, Fourier spectroscopy); physics education (use of microcomputers in teaching and labs); solid state physics (interaction of intense beams with optical materials, fracture of solids, defects in semiconductor materials, EXAFS Studies); shock wave physics (finite amplitude wave propagation, material properties under high pressure, dynamic mechanical failure, shock induced cavitation in liquids); surface and chemical physics (molecular interactions, with surfaces, reactive etching of surfaces, photoelectric and thermal emission microscopy, EXAFS), theory (quantum theories of measurement and state preparation, equations of state, energy sources and environment). These research groups offer graduate students the opportunity to pursue the original investigations required for advanced degrees. Undergraduate physics majors are encouraged to participate through the special problems course (Phys 499) or through parttime summer jobs that are sometimes available.

**Description of Courses**

For explanation see Index under "Symbols".

**Phys**

101  [P] General Physics 4 (3-3) Fundamental principles and applications of mechanics, heat, and sound; oriented toward non-physical science majors.


303  Modern Physics 3 Prereq Math 172; Phys 202. The quantum and relativity theories with applications from atomic, nuclear and solid state physics.


310  Modern Laboratory Techniques 3 (1-6) Prereq Phys 202, 303 or c/. Fundamental laboratory techniques of current interest, and classical experiments.

320  Mechanics 3 Prereq Math 315 or c/. Phys 102 or 202. Particle motion in one, two, and three dimensions; motions of systems of particles; rigid body motion; Lagrange's equations.

322  [P] Sound Waves and Music 3 For non-majors. A non-mathematical introduction to the physical nature of sound; theory of music; mechanical and electronic musical instruments.

330  Thermal Physics 3 Prereq Math 273 or c/. Temperature, first, second, and third laws of thermodynamics; changes of phase, simple systems, low-temperature phenomena, and equipartition theorem. (a/y)

341  Electricity and Magnetism 3 Prereq Math 315 or c/. Electrostatic fields, magnetic fields, dielectric and magnetic media.

342  Electricity and Magnetism 3 Continuation of Phys 341. Maxwell's equations, electromagnetic waves, special relativity.

345  Principles of Astronomy 3 Same as Astr 435.

380  [P] Physics and Society 3 Interactions of physics with society; energy; air and water pollution; recycling; communications and computers; physics and war; physics and art.

410  Electronics 3 (1-6) Prereq Phys 102 or 202. Laboratory construction and investigation of electronic circuits employed in research instruments.

435  Astronomy and Astrophysics 3 May be repeated for credit; cumulative maximum 6 hours. Same as Astr 435.

443  Optics 3 Prereq Phys 341 or c/. Geometric optics; diffraction, interference, and polarization phenomena of the electromagnetic spectrum; crystal optics. (a/y)

450  Quantum Mechanics 3 Prereq Math 315. Introduction to quantum theory with applications to atomic physics.
Credit not granted for both Phys 450 and 550.

461 Atomic and Molecular Physics 3 Prereq Phys 304. Physics of atoms and molecules using quantum theory. Credit not granted for both Phys 461 and 561.

463 Physics of the Solid State 3 Prereq Phys 304. Lattice vibrations and defects; ionic and electronic conductivities; band theory; magnetic properties; luminescence. Credit not granted for both Phys 463 and 563.


482 Geophysics 3 Prereq Phys 202 or 102; Math 171; Geol 101 or 102. Composition, movements, and origins of earth's atmosphere, crust, mantle, and core from seismic, magnetic, gravitational, and thermal evidence. (a/y)

490 Seminar in Physics Literature 1

499 Special Problems V 1-4 May be repeated for credit.

521 Classical Mechanics I 3 Laws of motion as developed by Newton, d'Alembert, Lagrange, and Hamilton; dynamics of particles and rigid bodies.


533 Thermodynamics 3 Prereq Phys 330; Math 440. Physical theories of equilibrium systematics and irreversible thermodynamics with applications in thermomagnetics, superfluids, and superconductivity.


538 Topics in Modern Astrophysics 3 May be repeated for credit; cumulative maximum 9 hours. Same as Astr 538.

541 Electromagnetic Theory 3 Prereq Phys 571, 572 or c/. Special relativity and the classical electromagnetic field; emission, propagation, and absorption of electromagnetic waves.

542 Electrodynamics 3 Prereq Phys 541, 552 or c/. Interaction of matter and electromagnetic radiation; classical and quantum electrodynamics.

550 Quantum Mechanics 3 Graduate level counterpart of Phys 450; additional requirements. Credit not granted for both Phys 450 and 550.

551 Quantum Theory I 3 Prereq Phys 571, 572 or c/. Physical and mathematical foundations; wave mechanics, bound states, and collision theory; matrix mechanics; approximation methods.

552 Quantum Theory II 3 Prereq Phys 551. Symmetry and invariance, angular momentum; formal theory of scattering; relativistic wave mechanics; second quantization.

561 Atomic and Molecular Physics 3 Graduate level counterpart of Phys 461; additional requirements. Credit not granted for both Phys 461 and 561.

563 Physics of the Solid State 3 Graduate level counterpart of Phys 463; additional requirements. Credit not granted for both Phys 463 and 563.

564 Atomic and Molecular Phenomena 3 Same as Ch P 564. (a/y)

565 Introductory Nuclear Physics 3 Graduate level counterpart of Phys 465; additional requirements. Credit not granted for both Phys 465 and 565.

571 Methods of Theoretical Physics 3 Prereq Math 440, 441. Mathematical methods for theoretical physics; linear algebra, tensor analysis, complex variables, differential equations, integral equations, variational calculus, and group theory.

572 Methods of Theoretical Physics 3 Prereq Phys 571. Continuation of Phys 571.

581 Advanced Topics 3 May be repeated for credit; cumulative maximum 12 hours. Topics of current interests in advanced physics.

590 Seminar 1 May be repeated for credit.

592 Wave Propagation Seminar 2 May be repeated for credit; cumulative maximum 4 hours. Waves in the continuum; elastic, plastic, and hydrodynamic waves; shock waves.

593 Seminar in Physics of Condensed Matter 1 May be repeated for credit; cumulative maximum 2 hours. Experimental and theoretical methods of study of matter in the condensed state and at interfaces.

594 Seminar in Solid State Physics 1 May be repeated for credit; cumulative max-
imum 2 hours. Current topics in solid state physics.

595 Nuclear Physics Seminar 1 or 2 May be repeated for credit; cumulative maximum 4 hours. Advanced nuclear and fundamental particle topics.

597 Seminar in the Foundations of Physics 1 May be repeated for credit; cumulative maximum 2 hours. Advanced seminar: mathematical and philosophical foundations of physics.

598 Teaching Undergraduate Physics Laboratories 1 May be repeated for credit; cumulative maximum 4 hours. Principles and practices of teaching, planning and management of undergraduate physics laboratories; choice and care of equipment.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

**Schedule of Studies**

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division hours.

A major in physics requires Phys 201, 202, 303, 304, 310, 320, 330, 341, 342, 410, 463, 465, 490 (1 hr.), 499 (1 hr.); Math 171, 172, 229, 273, 315 plus at least 6 hours from 371, 375, 410, 440, 441, or 448; Chem 105, 106 (or Chem 111); Cpt S 210 and Engi 201.

Optional physics courses include Phys 435, 443, 450, 482 as well as additional 499 credit.

Physics majors with interests in such fields as chemical physics, biophysics, geophysics, astrophysics, engineering physics, and computer science are urged to consult the departmental adviser for modifications of the requirements listed above. A minor in physics is also offered.

**Transfer Students**

Transfer students receive credit for equivalent courses taken elsewhere, but must meet the requirements for graduation listed above.

**Preparation for Graduate Study**

Students contemplating graduate work in physics should consider Phys 443, 450, 521, 571, 572, and additional mathematics courses.

At least one year of German, Russian, or French should also be taken.

**Department of Plant Pathology**


Plant pathology is the study of plant diseases, their economic effects, causes, nature, epidemiology and control. Opportunities for graduates in plant pathology include research and development for many types of agencies, teaching, extension, sales, and commercial service. Industry, government, educational institutions, and private foundations employ plant pathologists on a world-wide basis.

The undergraduate program in plant pathology is designed to provide a broad background in the biological, physical, and agricultural sciences. Many plant pathology majors continue in graduate study.

The courses offered in this department are designed both to train students expecting to make plant pathology or mycology their professional field of specialization and to provide supplementary training for students in other biological and agricultural fields, particularly agronomy, botany, horticulture, forestry, and entomology. The student who expects to become a professional plant pathologist is advised to include in his undergraduate studies fundamental courses in bacteriology, botany, chemistry, genetics, physics, and zoology.

A professional career in plant pathology requires graduate training, and the four-year course outlined under the schedule of studies is basic for such later specialization. Students often enter advanced work in plant pathology
following a major in biology, botany, agronomy, horticulture, or similar areas as well as from plant pathology. Specialized areas of advanced study include mycology, nematology, virology, epidemiology, disease physiology, host-parasite relationships, ecology of disease development, biochemistry of pathogenicity, disease resistance, chemical control, and air pollution. Research is conducted on diseases of grain crops, forage crops, forest trees, fruit, vegetables, ornamentals, and turf.

The department offers courses of study leading to the degrees of Bachelor of Science in Agriculture, Master of Science in Plant Pathology, and Doctor of Philosophy.

An interdisciplinary curriculum in integrated pest management is available to those whose interests span the areas of plant pathology and pest management. The curriculum is described under the General Agriculture section of this bulletin.

**Description of Courses**

For explanation see Index under "Symbols"

**PI P**

329 General Plant Pathology 3 Prereq Bio S 102 or Bot 201. Classification, symptoms, cause, epidemiology, and control of diseases of economic plants.

331 Forest Pathology 3 (1-6) Prereq Bio S 103. Parasitic and non-parasitic diseases of forest and shade trees; life histories of fungi as related to diseases.

405 Diseases of Washington Crops 3 (2-3) Prereq PI P 329. Diagnosis and management of diseases of the important crops in Washington. (a/y)

421 General Mycology 4 (2-6) Prereq Bot 201. The structure, life histories, classification, and economic importance of the fungi.

472 Biology of Fungi 4 (2-6) Prereq Bot 201. Life cycles, classification, and structure of fungi. Cooperative course taught at the University of Idaho. (a/y)

499 Special Problems V 1-4 May be repeated for credit.

501 Diseases of Plants 4 (3-3) Prereq PI P 329. Representative types of plant diseases (non-infectious, bacterial, fungal, viral).

503 Principles and Practices of Plant Disease Control 2 Prereq PI P 501. Biological, cultural, genetic, chemical, and legal bases of plant disease control. (a/y)

511 Viruses and Virus Diseases of Plants 4 (3-3) Prereq course in biochem or adv genetics. Nature of plant viruses, vector-virus relationships and virus diseases of plants.

512 Methods in Plant Virus Research 3 (2-3) Prereq PI P 511. Laboratory and greenhouse research methods used for serology, identification, characterization, and transmission of plant viruses. (a/y)

513 Nematodes and Nematode Diseases of Plants 2 (1-3) Prereq PI P 329. Anatomy, identity, and diseases caused by nematodes; techniques and control.

514 Phytopathology 4 (3-3) Prereq BC/BP 364; Bact 201. Isolation and characterization of bacteria having a saprophytic, symbiotic or pathogenic association with plants—molecular structure, function, and genetics.

515 Seminar 1 May be repeated for credit.

522 Basidiomycetes 3 (2-3) Prereq PI P 421. Taxonomy, physiology, and reproduction of rusts, jelly fungi, smuts, and higher basidiomycetes. (a/y)

523 Ascomycetes and Fungi Imperfecti 2 (1-3) Prereq PI P 421. Taxonomy, phylology, physiology, reproduction of ascomycetes, and fungi imperfecti. (a/y)

524 Lower Fungi 2 (1-3) Prereq PI P 421. Taxonomy, phylology, physiology, and reproduction of aquatic and terrestrial phycymycetes and myxomycetes. (a/y)

535 Physiology and Genetics of Parasitism 3 Prereq BC/BP 364; GenCB 301. Genetic and physiologic aspects of host-parasite interactions. (a/y)

540 Seed Pathology 3 (2-3) Prereq PI P 329. Seed-borne pathogens including fungi, bacteria, and viruses, nature of their infection, and relation to spread of plant diseases. Cooperative course taught at the University of Idaho. (a/y)

558 Genetics of Fungi 3 Genetic systems and sexuality of fungi. Cooperative course taught at the University of Idaho. (a/y)

563 Advanced Forest Pathology V 2-4 Prereq PI P 331. Field methods and laboratory techniques; tree diseases, wood rots, their causal organisms, relation to forest practices. Cooperative course taught at the University of Idaho.

564 Advanced Forest Pathology V 2-4 Prereq PI P 331. Field methods and laboratory techniques; tree diseases, wood
rots, their causal organisms; relations to forest practices. Cooperative course taught at the University of Idaho.

600 Special Projects or Independent Study Variable credit.
700 Master’s Research, Thesis, and/or Examination Variable credit.
800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies

At least 40 of the total hours required for the bachelor’s degree in this program must be in upper-division courses.

The following list includes the departmental requirements for the undergraduate plant pathology curriculum. Students are advised to consult their advisers for appropriate sequencing of courses and in selecting electives consistent with vocational and professional objectives. They should also check fulfillment of general university requirements.

Agron 305 Weeds 3
Bact 101 Elem Bact 4
Bio S 103 and 104 Intro Biol 8
Bio S 372 Gen Ecol 4
Biom 301 Agric Stat 3
Bot 201 Intro Bot 4
Bot 332 Intro Sys Bot 4
Bot 320 Intro Plant Phys 3
Chem 105 and 106 Prin of Chem 8
Chem 240 Elem Org Chem 4
Econ 201 Contem Role of Econ 4
Engl 101 Engl Comp 3
Engl 351 Creative Writing: Prose 3
Entom 340 Agric Entom 3
GenCB 301 General Genetics 3
Math 107 Precal Math 4
Phys 101 and 102 Gen Phys 8
Pl P 329 Gen Plant Path 3
Soils 201 Soils 3
Ag Electives 15

The following substitutions may be allowed with departmental approval: Bact 201 for Bact 101; Chem 101/102 for Chem 105/106; Ag Ec 201 for Econ 201; Ag 205 for Engl 351; Math 171 for Math 107; Entom 343 for Entom 340.

Preparation for Graduate Study

As preparation for work toward an advanced degree a student should have completed a bachelor’s degree; one year each of general inorganic chemistry, botany, zoology, physics, and German; one semester each of systematic bot-

any, plant physiology, bacteriology, general plant pathology, entomology, precalculus, organic chemistry, and report writing or advanced composition.

Department of Political Science

Professor and Department Chair, J. O. Pierce; Professors, J. D. Dowell, P. M. Morgan, W. H. Peterson, C. H. Sheldon, T. Tsuruta; Associate Professors, T. E. Cook, N. H. Lovrich, W. F. Mullen; Assistant Professor, P. R. Hagner.

Criminal Justice, Director and Associate Professor, R. Menke; Assistant Professors, F. Bernat, O. Maronin.

Courses in political science are offered in six principal fields: public policy formation, comparative government, public law, public administration, international politics and organization, and political theory and methodology.

The department offers courses of study leading to the degrees of Bachelor of Arts in Political Science, Master of Arts in Political Science, and Doctor of Philosophy.

The department also is the locus of the Criminal Justice Program, which offers courses of study leading to the Bachelor of Arts in Criminal Justice and the Master of Arts in Criminal Justice. For details, see the Criminal Justice section of this bulletin.

Prelaw Studies

No specific major is necessary to be eligible for law school. The Department of Political Science Prelaw Advising Center assists all students interested in law school regardless of their intended major.

Through its prelaw curriculum, Option II, the department offers students a selection of courses specially designed to prepare them adequately for law school. This curriculum has been prepared on the basis of recommendation of the Association of American Law Schools. Students who choose other departmental options may also be eligible to attend law school if they meet admission requirements.

Public Service

Government is now the nation’s largest employer. Many thousands of these officials are political science graduates. The department will be glad to advise students concerning training
and career opportunities in federal, state, and local governments, in the foreign service, and in related fields.

Division of Governmental Studies and Services
A unit of the Department of Political Science (DGSS) is an instrument for extending beyond the classroom and into public service the resources represented in the department's teaching and research personnel. Specifically, the functions of the division include the following: performing research and issuing publications relating to government and public affairs; providing training and consulting services to public agencies and private organizations concerned with public affairs; and maintaining liaison with governmental intern programs which afford practical government work experience for students who desire it. The DGSS maintains a collection of specialized government publications of current interest and, in general, acts as a link between the teaching of government and the conduct of public affairs.

Teaching
It is possible to obtain the bachelor's degree in political science while meeting the requirements for a Washington teaching certificate. Information, in addition to that given under Option IV below, can be obtained from the department.

Minor
A minor in political science requires a minimum of 16 semester hours, half of which must be in upper-division courses.

Description of Courses

For explanation see Index under "Symbols"

General and Introductory Courses
Pol S
102  [S] Introduction to Comparative Politics 3 Nature of the state; fundamental problems of government and politics; an ideological and institutional comparison of democracies and dictatorships.
198  [S] Political Science Honors 3
222  [S] International Politics 3 Creation and operation of national, international, and supranational communities; major world problems since 1945.

Political Theory and Methodology
Pol S
333  [S] Development of Marxist Thought 3 Marxist theory from the original writings of Marx and Engels to contemporary developments.
434  [S] American Political Thought 3 The genesis and development of political thought in the United States. Credit not granted for both Pol S 434 and 534. (a/y)
437  Classical Political Thought 3 The development of political philosophy from the pre-Socratics to Machiavelli.
438  Recent Political Thought 3 The development of political thought since Machiavelli.
530  The Scope of Political Science 3 Prereq 12 hrs Pol S. Historical development and present status of the discipline; contemporary issues and future trends.
531  Research Methods in Political Science 3 Prereq 12 hrs Pol S; Soc 321. Development of research designs; methods of data collection; analysis of data; data processing and computer applications.
534  American Political Thought 3 Graduate level counterpart of Pol S 434; additional requirements. Credit not granted for both Pol S 434 and 534.
594  Seminar in Political Theory 3 May be repeated for credit; cumulative maximum 6 hours.

Comparative Government
Pol S
310  [S] Democratic Governments 3 Theoretical foundations, institutions, policy processes and problems of modern democratic political systems.
410  Government of Canada 3 Political institutions and processes of Canada. (a/y)
412  Government of the USSR 3 Institutions and politics of the Soviet Union. Credit not granted for both Pol S 412 and 512.
413  Latin American Governments 3 Institutions and political processes of selected Latin American republics. Credit not granted for both Pol S 413 and 513. (a/y)
435  Politics of Developing Nations 3 Issues and problems of political development and modernization common among de-
Developing nations. Credit not granted for both Pol S 435 and 535.

436 Comparative Politics: China and Japan
3 Government, politics, and society of two major Asian powers. Credit not granted for both Pol S 456 and 536.

462 Human Issues in International Development
3 Same as Anth 462.

471 Contemporary South Asia
3 Same as Hist 471.

472 Governments of Great Britain and France
3 Political institutions and policy-making processes in Great Britain and France. Credit not granted for both Pol S 472 and 572.

473 Governments of German Federal Republic and Italy
3 Political institutions and policy-making processes in the German Federal Republic and Italy. Credit not granted for both Pol S 473 and 573.

512 Government of the USSR
3 Graduate level counterpart of Pol S 412; additional requirements. Credit not granted for both Pol S 412 and 512.

513 Latin American Governments
3 Graduate level counterpart of Pol S 413; additional requirements. Credit not granted for both Pol S 413 and 513.

535 Politics of Developing Nations
3 Graduate level counterpart of Pol S 435; additional requirements. Credit not granted for both Pol S 435 and 535.

536 Comparative Politics: China and Japan
3 Graduate level counterpart of Pol S 436; additional requirements. Credit not granted for both Pol S 436 and 536.

572 Governments of Great Britain and France
3 Graduate level counterpart of Pol S 472; additional requirements. Credit not granted for both Pol S 472 and 572.

573 Governments of the German Federal Republic and Italy
3 Graduate level counterpart of Pol S 473; additional requirements. Credit not granted for both Pol S 473 and 573.

595 Seminar in Comparative Politics
3 May be repeated for credit; cumulative maximum 6 hours.

International Politics and Organization

Pol S

414 Inter-American Relations
3 The Monroe Doctrine, Good Neighbor Policy, and Alliance for Progress; structure and role of the OAS. Credit not granted for both Pol S 414 and 514. (a/y)

421 International Law
3 Law of peace, status of war, and pacific settlement. Credit not granted for both Pol S 421 and 521.

423 International Organization and Administration
3 The process, problems, and progress: emphasis on the United Nations and the quest for peace. Credit not granted for both Pol S 423 and 523.

425 American Diplomatic History
1776-1900
3 Same as Hist 411. Credit not granted for both Pol S 425 and 525.

426 American Diplomatic History in the Twentieth Century
3 Same as Hist 412. Credit not granted for both Pol S 426 and 526.

427 United States Foreign Relations
3 Ends and means in foreign policy; organization, management, control, and current policy issues. Credit not granted for both Pol S 427 and 527.

428 European Diplomacy
1848-1914
3 Same as Hist 460. (a/y)

429 European Diplomacy since 1914
3 Same as Hist 461. Credit not granted for both Pol S 429 and 529. (a/y)

514 Inter-American Relations
3 Graduate level counterpart of Pol S 414; additional requirements. Credit not granted for both Pol S 414 and 514.

521 International Law
3 Graduate level counterpart of Pol S 421; additional requirements. Credit not granted for both Pol S 421 and 521.

523 International Organization and Administration
3 Graduate level counterpart of Pol S 423; additional requirements. Credit not granted for both Pol S 423 and 523.

525 American Diplomatic History
1776-1914
3 Same as Hist 511. Graduate level counterpart of Pol S 425; additional requirements. Credit not granted for both Pol S 425 and 525.

526 American Diplomatic History in the Twentieth Century
3 Same as Hist 512. Graduate level counterpart of Pol S 426; additional requirements. Credit not granted for both Pol S 426 and 526.

527 United States Foreign Relations
3 Graduate level counterpart of Pol S 427; additional requirements. Credit not granted for both Pol S 427 and 527.

529 European Diplomacy Since 1914
3 Same as Hist 561. Graduate level counterpart of Pol S 429; additional requirements.
Credit not granted for both Pol S 429 and 529.


575 Seminar in Theoretical Approaches to International Relations 3 Group dynamics, systems analysis, decision-making, communications models, game theory, simulations, and rationality models.

590 Seminar in U.S. Foreign Policy 3 May be repeated for credit; cumulative maximum 6 hours. Prereq one course in international relations, international law, organization, or American foreign relations. Methodology, decision-making institutions and processes.

Public Policy Formation

Pol S

305 Women and Politics 3 Cross cultural and cross national analysis of women as subjects and objects of political systems.

317 Mass Media and the Political Process 3 Relationship between the media and American political institutions and the public. (a/y)

318 [S] Political Parties and Pressure Groups 3 Theories of parties; characteristics of American parties; organization and behavior of pressure groups.

324 [S] Black Politics 3 Political culture, roles, and strategies of black people in the United States; impact upon public policy.

404 The Judicial Process 3 Same as Pol S 404 below.

416 Introduction to Policy Analysis 3 Analysis of public policy formation, evaluation and implementation.

417 The Electorate 3 Measurement and interpretation of electoral behavior; factors influencing the electorate; voter competence; representation of the electorate. Credit not granted for both Pol S 417 and 517.

450 The Legislative Process 3 Role of legislatures in a democratic system; problems of representation; election and tenure of lawmakers; legislative organization and procedures. (a/y)

455 The Presidency 3 Organization and processes of executive institutions at the national level; uses and limits of executive power. Credit not granted for both Pol S 455 and 555.

517 The Electorate 3 Graduate level counterpart of Pol S 417; additional requirements. Credit not granted for both Pol S 417 and 517.

520 Water Resources Politics and Policy 3 Significant controversies and major developments in western water resource policy.

555 The Presidency 3 Graduate level counterpart of Pol S 455; additional requirements. Credit not granted for both Pol S 455 and 555.

556 Seminar in Governmental Policy Analysis 3 Identification and analysis of policy alternatives in government including experience of preparation of policy analysis for use in governmental agencies. Cooperative course taught at the University of Idaho.

591 Seminar in Public Policy Formation 3 May be repeated for credit; cumulative maximum 6 hours.

Public Administration

Pol S

440 Introduction to Public Administration 3 Basic theories of administrative organization, relationships, and behavior. Credit not granted for both Pol S 440 and 540.

443 Administrative Regulation 3 Government controls over the economy focusing upon the administrative regulatory processes, their environment, and techniques. Credit not granted for both Pol S 443 and 543.

445 Public Personnel Administration 3 Development of American civil service systems and concepts; problems and techniques involved in selection and management of public employees. Credit not granted for both Pol S 445 and 545.

446 Public Budgeting 3 The government budget as an instrument of politics, planning and control; organizing for democratic accountability. Credit not granted for both Pol S 446 and 546.

455 The Presidency 3 Same as Pol S 455 above.

501 Seminar in Public Administration 3 Cooperative course taught at the University of Idaho.

540 Introduction to Public Administration 3 Graduate level counterpart of Pol S 440; additional requirements. Credit not granted for both Pol S 440 and 540.

543 Administrative Regulation 3 Graduate
level counterpart of Pol S 443; additional requirements. Credit not granted for both Pol S 443 and 445.

545 Public Personnel Administration 3 Graduate level counterpart of Pol S 445; additional requirements. Credit not granted for both Pol S 445 and 446.

546 Public Budgeting 3 Graduate level counterpart of Pol S 446; additional requirements. Credit not granted for both Pol S 446 and 546.

555 The Presidency 3 Same as Pol S 555 above.

565 The Government of Metropolitan Areas 3 Political processes, roles, institutions, and problems. (a/y)

592 Topics in Public Administration 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Pol S 440 or 445.

Public Law
Pol S

300 [S] The American Constitution 3 Prereq Pol S 101. Constitutional principles as established by the Supreme Court and related political developments.

402 Civil Liberties 3 Prereq Pol S 101. Origin and development of civil liberties; responsibility of the branches of government and the people for their maintenance.

404 The Judicial Process 3 Prereq Pol S 101. Relationship of judicial behavior to structure, politics and the behavior of other participants in the judicial process.

421 International Law 3 Same as Pol S 421 above.

443 Administrative Regulation 3 Same as Pol S 443 above.

521 International Law Same as Pol S 521 above.

593 Seminar in Public Law 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Pol S 300. Emphasis on substantive law or judicial process.

Problems, Seminar, and Research, and Thesis
Pol S

497 Political Science Internship V 1-12 May be repeated for credit; cumulative maximum 12 hours. Prereq Pol S 101 or 206. Participation as intern in state, or local governmental unit.

499 Special Problems V 1-4 May be repeated for credit.

600 Special Projects or Independent Study Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in these programs must be in upper-division courses.

Students wishing to take Pol S 499 must have at least junior standing and consent of the instructor; no more than 3 hours of 499 or 6 hours of 497 may be counted toward the departmental Pol S requirements.

Students wishing to graduate with a certificate from the Honors program in political science must take a 500-level course or seminar in political science.

Option I. Political Science

Option I is designed to provide maximum flexibility for students desiring general undergraduate training in political science, preparing for graduate work in political science, or aiming for the U.S. Foreign Service entrance examinations.

Requirements for graduation include 30 hours of Pol S, at least 12 of which must be earned at WSU.

Before undertaking this schedule of studies, a student should have fulfilled most of the graduation requirements of the College of Sciences and Arts. The following courses, some of which meet these requirements, are strongly recommended, but not required.

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<td>Anth 101 or Soc 101</td>
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Junior Year

First Semester

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Second Semester
Pol S Elective 6
Hum or Soc S Elective 6
Elective 3

Senior Year
First Semester
Pol S Elective 6
Hum or Soc S Elective 6
Elective 3

Second Semester
Pol S Elective 3
Hum or Soc S Elective 6
Elective 6

Option II. Prelaw
The Prelaw Advising Center in the department assists all students interested in law school regardless of their intended major. No specific major is necessary to be eligible for law school. Through its prelaw curriculum, Option II, the department requires a selection of courses designed to prepare students for law school and the legal profession, with considerable flexibility provided in order to fit student interests. Requirements for graduation include 24 hours of Pol S, at least 12 of which must be earned at WSU.

Before undertaking this option, a student should have fulfilled most of the graduation requirements of the College of Sciences and Arts. The following courses, which meet these requirements, are strongly recommended, but not required.

Pol S 101 or 198 and 6 hrs from 102, 206, and 222 9
Hist Elective* 6
Anth 101 or Soc 101 3
Econ 201 or 102 and 203 4-6
Psych 101 or 102 Intro Psych 3
Phil 201 Elem Log 3

Junior Year
First Semester
Pol S 300 Amer Const 3
Engl 201 or 301 3
Acctg 230 Prin Acctg 4
Elective 5

Second Semester
Pol S Elective 6
Econ, Hist, Psych, or Soc Elective 3
Elective 6

*One course in American history plus one additional course from Hist 101, 102, 110 or 111.

Senior Year
First Semester
Pol S Elective 3
Econ, Hist, Psych, or Soc Elective 3
Elective 9

Second Semester
Pol S Elective 3
Elective 12

Option III. Public Administration
This program is designed to provide a broad foundation in political science and related subjects on which can be built either a public service career or graduate specialization in public administration.

Within the limits of the basic requirements outlined, special course patterns can be arranged for students particularly interested in such specialties as city management, city planning, and public personnel administration.

Requirements for graduation include 30 hours in Pol S distributed among fields as follows: at least two advanced courses in public administration (including Pol S 440), two in public policy formation, and one in public law (Pol S 300). Also required are Acctg 230, Econ 340, a course in statistics (Soc 321, QMeth 215, Math 360, or Psych 311), and Engl 201 or 301.

Appropriate electives include courses in political science, computer science, psychology, sociology, history, economics, architecture, and civil engineering.

Before undertaking this schedule of studies, a student should have fulfilled most of the graduation requirements of the College of Sciences and Arts. The following courses, which meet these requirements, are strongly recommended, but not required.

Junior Year
First Semester
Pol S 300, 440 6
Acctg 230 Prin Acctg 4
Elective 5
Second Semester
Pol S Elective 6
QMeth 215, Soc 321, Math 361, or Psych 311 3-4
Elective 2-3

Senior Year
First Semester
Pol S Elective 6
Econ 340 Pub Fin Tax 3
Elective 6

Second Semester
Pol S Elective 6
Elective 9

Option IV. Teaching
This program is designed for those who wish to obtain the Bachelor of Arts in Political Science while also qualifying for the Washington State Provisional Certificate to teach on the secondary level in the field of social studies.

In meeting the graduation requirements for the College of Sciences and Arts, students must include Psych 102, Hist 110, 111. Econ 201 or 102-203 are strongly recommended.

Department requirements are:

a) 26 hours in political science, including Pol S 101, 206, 222, 300, 318.

b) a teaching minor in history (18 hours) including Hist 110, 111, 422 and 9 additional hours, at least 3 of which must be upper division. Hist 480, Methods of Teaching Social Studies, is an additional requirement.

c) a second teaching minor, other than in social studies, selected from among those listed in the education section of the catalog. English or speech is strongly recommended.

d) 25 hours in education consisting of Educ 300, 301, 303, 358 or 359, 402, 403 or 404, 405 or 406. Those who wish to teach both junior and senior high school must add Educ 450 or 451 to their programs.

e) one course from H Ed 480 or 481.

Students undertaking the above program must add education as a second major, preferably during their sophomore year, but before they enroll in any education courses.

Option V. Public Affairs
Option V provides a program for undergraduates whose career interests require a course background in a specific substantive public policy area, in addition to basic political science training. To accommodate the varying interests of those electing this option, programs are individually tailored in close consultation with his or her adviser. The program for each student includes 24 hours of key courses in political science plus 15 hours of relevant outside courses relating to the substantive area in which the student plans to work (e.g., urban affairs, welfare, natural resources and energy policy). Sample curricula are available from the Option V adviser in the department.

Before undertaking this option, a student should have fulfilled the graduation requirements of the College of Sciences and Arts. The following courses, which meet these requirements in part, are strongly recommended.

Junior Year
First Semester
Pol S 101 or 198, and 206 6
Hist Electives 3-6
Anth 101 or Soc 101 3
Psych 101 or 102 Intro Psych 3

Second Semester
Pol S 416 Intro Policy Analy 3
Pol S Elective 3
Policy Area Elective 3
Electives 3

Senior Year
First Semester
Pol S 497 Internship 12

Second Semester
Pol S Elective 3
Policy Area Elective 6
Electives 9

Preparation for Graduate Study
Students who have had basic undergraduate training in political science while majoring in such subjects as economics, business administration, history, criminal justice, or sociology may be well prepared for graduate study in political science.
Undergraduates who are pursuing their studies at other institutions or through other curricula at this institution and who contemplate graduate work in this department will do well to elect courses similar to those required in the above schedules of studies.

Predental Curriculum

Associate Professor and Coordinator, H. A. Went; Advisers: Professor, L. B. Kirschner; Associate Professors, J. W. Crane, H. Hosick, D. King, A. Koch, K. McIvor, P. Schroeder.

Preparation for dental school requires a minimum of two years of college work; however, only a few exceptional students are accepted with the abbreviated background. Three years of college training are strongly recommended, and, where possible, the baccalaureate degree should be secured before attending a professional school.

Students who complete three years in residence and who have fulfilled all General University Requirements for Graduation may receive the Bachelor of Science degree after one year of satisfactory work in an accredited dental school.

The following constitutes the minimum requirements:

1. One year (6 semester hours) of college English.
2. One year of college physics.
3. One year of inorganic chemistry.
4. One year of organic chemistry.
5. One year of biology is mandatory, and additional work is strongly recommended.
6. Twenty-one or more hours of electives in the social sciences and humanities.

The University of Washington School of Dentistry in addition requires biochemistry and bacteriology.

Admission to a school of dentistry is based on satisfactory completion of the entrance requirements of that school, attainment of satisfactory scholastic record, satisfactory scores on the Dental Admission Test, and the possession of personal qualifications necessary for the study of dentistry, and a single composite letter written by the coordinator.

Premedical Curriculum

Associate Professor and Coordinator, H. A. Went; Advisers: Professor, L. B. Kirschner; Associate Professors, J. W. Crane, H. Hosick, D. King, A. Koch, K. McIvor, P. Schroeder.

Preparation for medical school requires a minimum of three years of college work; however, extremely few students are accepted with this abbreviated background. Such students who have fulfilled all General University Requirements for graduation may receive the Bachelor of Science degree after one year of satisfactory work in an accredited medical school but this is not recommended. Since there are twice as many applicants as there are available places in medical schools, preference is usually given to candidates who have attained the baccalaureate degree. The following will meet the minimum requirements of most medical schools:

1. One year of English composition.
2. One year of inorganic chemistry.
3. One year of organic chemistry.
4. One year of college physics.
5. Mathematics through calculus.
6. One year (and preferably two) of college biology.
7. Twenty-one or more hours of electives in the social sciences and humanities.

In addition, all premedical students must take the Medical College Admissions Test (MCAT) before applications are made for admission to medical schools.

Most medical schools urge premedical students to secure a broad training in fundamental subjects rather than to anticipate specific subjects that will be repeated in medical school.

Acceptance of a student by a medical school is contingent on the satisfactory completion of at least the minimum entrance requirements of that school, attainment of a superior scholastic record, good to excellent scores on the MCAT, and possession of a personal qualifications appropriate to success in the medical profession. Most schools require applicants to appear for a personal interview. In addition, letters of recommendation from several college teachers must strongly support the applicant, or a single composite letter written by the coordinator. The latter is preferable.

Many medical schools welcome applications from students who have majors, or who have taken considerable work, in such diverse areas as humanities, mathematics, psychology, sociology, physics, chemistry, biochemistry, and engineering. Adequate latitude exists in the medical school requirements so that the adviser usually is able to suggest a schedule of studies to meet the needs of the individual student.
Department of Psychology


The bachelor's degree program provides for either a major or a minor in psychology. The program for majors is designed for those who wish to study psychology as part of a liberal education; for those who plan to use their training in related vocations such as the professions, governmental organizations, business and industry, and psychological services; and for those who are preparing for graduate work in psychology. Course offerings are open to students in other departments who need a background in those aspects of psychology which are related to their respective fields. Also, it is possible to combine a major in psychology with the certificate program in Alcohol Studies.

The graduate program leads to advanced degrees for qualified students who plan careers as psychologists. The course of study for the Doctor of Philosophy degree may be directed toward a specialization in clinical psychology or in one or more of the areas of experimental psychology—learning/cognition and biological/sensory.

The graduate training program in clinical psychology at Washington State University is accredited by the American Psychological Association.

The department offers courses of study leading to the degrees of Bachelor of Science in Psychology, Master of Science in Psychology, and Doctor of Philosophy.

Excellent facilities are available for instruction and research in psychology. There are specially designed facilities for research in learning memory, sensory processes, social interaction and behavior modification. Departmental facilities also include the Comparative Behavior Laboratory, Primate Research Center and the Human Relations Center, which is a training clinic. In addition, there are available cooperative arrangements with other units of the university and with outside institutions which make it possible for students to gain first-hand experience in research and professional work. The university maintains a comprehensive library of books and journals in psychology and related fields.

Description of Courses

For explanation see Index under "Symbols"

Psych


102 [S] Introductory Psychology: Human Behavior 3 Personality, development, social behavior, human abilities, abnormal behavior and treatment.

198 [S] Psychology Honors 3 May substitute for Psych 101 or 102 as a prerequisite to later courses.

230 [S] Human Sexuality 3 Prereq Psych 101 or 102. Sexuality in personal development; personal, cultural, biological influences on sexual identification and behavior; fertility, reproduction, sexual function, sexuality and personality.

285 Introduction to Experimental Methods in Psychology 3 (2-3) Prereq Psych 101 or 102. Designing, conducting, and reporting research in selected areas of experimental psychology.

301 Seminar in Psychology V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq 6 hrs Psych.

306 Industrial Psychology 3 Prereq Psych 101 or 102. Individual and group goals; organizational structure and theory; leadership, design of jobs; personnel selection and training; engineering psychology.

307 Human Factors 3 Prereq Psych 101 or Engr major. Human limitations and capabilities in architectural and engineering design; system analysis.

311 Elementary Statistics in Psychology 4 Prereq Math 101 or 3 sem high school algebra. Descriptive statistics, probability, and inference; design and interpretation of research.

321 Introduction to Personality 3 Prereq Psych 101 or 102. Theories, concepts, methods, discoveries in psychology of personality.

323 Self Control 3 Prereq Psych 101 or 102. Analysis of self-control problems; ap-
324 Psychology of Women 3 Prereq Psych 101 or 102. Socialization and sex roles of women; a psychological perspective.

333 Abnormal Psychology 3 Prereq 6 hrs Psych; Psych 321. Problems of abnormality from traditional and evolving points of view; types, therapies, outcomes, preventive techniques.

340 Introduction to Clinical Psychology 3 Prereq 6 hrs Psych; Psych 321 or 333. Professional problems including theory, training, relations with clients, institutions, public.

350 [S] Social Psychology 3 Prereq Psych 101 or 102. Attitude changes, conformity, interpersonal attraction, values, groups and social influences explored to construct a coherent viewpoint of social psychology.


361 Principles of Development 3 Prereq Psych 101 or 102. Major theories of development; contribution of biological and environmental factors; relationship of these factors to child-rearing and social issues.

363 Psychology of Aging 3 Prereq Psych 101 or 102; one Bio S course. Psychological processes of aging; changes in sensory motor, cognitive motivational and personality characteristics; research methodologies for the study of aging.

365 Problems of Alcohol Addiction and Abuse 3 Prereq Psych 101 or 102 or Soc 101. Current theory, treatment facilities, and problems related to alcoholism and alcohol abuse.

366 Problems of Alcohol Addiction and Abuse 3 Prereq Psych 101 or 102 or Soc 101. The procedures, techniques and knowledge required of employees of alcoholism facilities.

372 Introduction to Physiological Psychology 3 Prereq Psych 101 or 102; Bio S 102 or 103. Functional relationship between nervous system and behavior; integrated organ systems, sensory processes, and investigative procedures.

384 Psychology of Perception 3 Prereq Psych 101 or 102. Perception of size, depth, form, shape; illusions, contrast; historical and modern theories and research; applications and demonstrations.

390 Operant Behavior 3 Prereq Psych 101 or 102. Principles of operant and classical conditioning.

401 Historical Development of Psychology 3 Prereq 9 hrs Psych or senior standing. Concepts, methods, theories, trends, and systems.


430 Experimental Personality and Social Psychology 3 Prereq Psych 101 or 102; Psych 311; Psych 321 or 350. Group behavior, attitude measurement and change; the relation of personality to social variables and individual differences in overt behavior.

431 Laboratory in Personality and Social Psychology 1 (0-3) Prereq c/ in Psych 430. Experimental techniques in personality and social psychology.

444 Basic Helping Skills 2 (0-6) Prereq 6 hrs Psych. By interview only. Not open to freshmen. Training in basic skills to work with varied types of clients; didactic and role play instruction.

445 Undergraduate Practicum V 2 (0-6) or 3 (0-9) May be repeated for credit; cumulative maximum 6 hours. Prereq 6 hrs Psych. By interview only. Not open to freshmen. Supervised experience in local and county agencies; application of psychological principles to paraprofessional counseling.

464 Psychological Disorders of Children 3 Prereq Psych 101 or 102; Psych 360 or CFS 240. Intellectual and emotional disorders of children.

470 Motivation 3 Prereq Psych 101 or 102; Psych 311. Different motivational systems; analysis of environmental and biological factors influencing motivation, with emphasis on human motivation.

471 Laboratory in Motivation 1 (0-3) Prereq c/ in Psych 470. Research techniques in motivation.

473 Advanced Physiological Psychology 3 Prereq Psych 372. Neurophysiological, hormonal, and biochemical bases of regulatory behavior; theoretical and applied issues. (a/f)

477 Primate Behavior 3 Prereq Psych 285 or a Zool lab course. Laboratory and field investigations on behavior of nonhuman primates; emphasizing learning, memory, motivation, family structure,
habitat and behavior development. (a/y)

480 Sensory Processes 3 (2-3) Prereq Psych 101, 285, 311. Principles of sensation as an area of experiential psychology; visual and auditory systems.

490 Psychology of Learning 3 Prereq 8 hrs Psych; Psych 311. Techniques, findings, and theories of learning and retention.

491 Psychology of Learning Laboratory 1 (0-3) Prereq c/ in Psych 490. Research on techniques, findings, and theories of learning, and retention.

497 Instructional Practicum V 1-4 May be repeated for credit; cumulative maximum 4 hours.

498 Research Participation V 2 (0-6) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. Prereq 9 hrs Psych including a lab course. By interview only. Participation in the current research of departmental faculty.

499 Special Problems V 1-4 May be repeated for credit.

502 Research Participation V 1 (0-4) to 3 (0-9) May be repeated for credit; cumulative maximum 16 hours. Research design, equipment, data collection, data analysis, and report writing.

503 Communication in Psychology 3 Written and oral communication in psychology; psychological principles upon which good communication is based.

504 History of Psychology: Theoretical and Scientific Foundations 3 Roots of scientific explanation in psychology are traced through various philosophical schools and psychological movements.

506 Seminar in Current Problems 2 May be repeated for credit.

507 Seminar in Current Problems 3 May be repeated for credit.

508 Seminar in Psychology V 1-3 May be repeated for credit.

511 Advanced Statistics in Psychology 3 Prereq Psych 311.

512 Statistical Inference and Research Design 3 Prereq Psych 511. Psychology statistics used in the design and analysis of experiments.

513 Seminar in Quantitative Psychology 3 Prereq Psych 511, 512.

515 Program Evaluation 3 Substantive, methodological and political issues in evaluation of local and national human service programs.

520 Theoretical Foundation of Psychotherapy 3 Major therapy systems.

521 Behavior Modification 3 (2-3) Prereq Psych 491, 520. Learning principles applied to modifying behavior of children and adults in institutions, clinics, and schools.

528 Behavioral Mechanisms in Physiology 3 Same as V Ph 528.

530 Professional Issues 3 Ethical and philosophical issues faced in the practice of psychology.

533 Psychopathology: Theory and Research 3 Theory and research concerning deviant behavior.

535 Clinical Assessment 3 Interviewing procedures, case formulation, and case presentation.

536 Personality Assessment 3 Theories and methods of personality assessment.

539 Intelligence: Theory and Assessment 3 Theories and methods of appraising intelligence.

540 Group Psychotherapy 3 By interview only. Psychotherapeutics in the context of the group.

542 Community Psychology 3 Prereq 1 yr graduate work. Community psychological concepts; consultation, training, and research roles for psychologists in community programs. Community project experience required.

543 Clinical Child Psychology 3 Behavior problems, diagnosis and treatment procedures with children.

545 Clinical Methods 3 (0-9) May be repeated for credit. Prereq Psych 520, 530, 533, 536, 539 or c/ in Psych 520, 530, 533, 536, 539 or c/ in Psych 491, 520. By interview only. Supervised practice in the clinical application of psychology.

546 Advanced Clinical Methods V 1-3 May be repeated for credit; cumulative maximum 12 hours. Prereq Psych 545 or c/ in Psych 545. By interview only. Advanced practice in the clinical application of psychology; supervised practical training.

550 Advanced Social Psychology 3 Theories, findings, and methods in group processes, interpersonal attraction, and personal perception.

551 (552) Interpersonal Dynamics 3 Theories and research in interpersonal dynamics; cognitive, learning, equity and attributional concepts.

553 Personality: Theory and Research 3 Basic concepts in personality theory and research.

556 Seminar in Personality and Social Psychology 3

561 Developmental Psychology 3 Research
dealing with the development of perceptual, motivational and cognitive processes in animals and children.

564 Seminar in Problems of Alcoholism 3
History and current status of alcoholism in western cultures; treatment of alcoholics; physiology, pharmacology, and rehabilitation.

571 Motivation 3 Issues of clinical, social, and biological theories of motivation and emotion.

574 Physiological Psychology 3 May be repeated for credit. Neuroanatomical, neurochemical, and other biological bases of human and animal behavior.

575 Somatic Treatment Methods 3 Prereq Psych 533. Clinical aspects of physical medicine from standpoint of impact on and relevancy for clinical psychology.

576 Neuropsychological Assessment 3 Brain-behavior relations in humans and the assessment of behavioral changes accompanying cerebral injury.

577 Comparative Psychology 3 Comparative and operational analysis of some broadly represented animal behaviors.

584 Sensation and Perception 3 (2-3) Sensory and perceptual limits and functions of the human organism.

585 Vision 3 (2-3) Prereq Psych 584. Experimental, theoretical, and optical approaches to the psychological problems of vision.

591 Behavior Theory and Learning 3

592 Human Learning and Memory 3 Experimental approaches to human learning, memory and verbal processes.

593 Experimental Analysis of Behavior 3 Operant conditioning in relation to the experimental evidence currently available; examination of research strategies.

595 Clinical Internship in Psychology 16 (5-33) May be repeated for credit. Prereq passing of prelims and completion of course work for Ph.D. Clinical training in an internship approved by American Psychological Association or by WSU.

600 Special Projects or Independent Study Variable credit.

700 Master’s Research, Thesis, and/or Examination Variable credit.

702 Master’s Special Problems, Directed Study and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Beyond certain minimum requirements, there is flexibility in the major (or minor) program, in accordance with the needs of the individual student. A person may "certify" as a major at the end of the freshman year. Students who are considering a psychology degree should, as early as possible in their academic careers, seek consultation with a faculty adviser in the Department of Psychology for assistance in planning their individual programs.

The Bachelor of Science in Psychology requires a minimum of 30 credit hours in psychology, at least 15 hours of which must be in upper-division courses. The student must take at least 10 credit hours of psychology in residence at WSU and must maintain at least a C average in psychology courses.

Required Courses

*Psych 101, 102, 285, 311
*Bio S 102, or 103
*Math 107, 171, or 201

Students must meet the graduation requirements of the College of Sciences and Arts.

Recommended Courses

At least one upper-division psychology lab course plus one 3-hour course from Psych 445, 497, 498, 499. Psychology electives will be chosen in consultation with adviser.

Numerous electives during the first two years—mathematics, biology, physics, chemistry, literature, history, philosophy, sociology, anthropology—contribute substantially to the study of psychology. Again, consultation with a faculty adviser is recommended prior to selecting either psychology courses or supporting courses in other areas.

Students in the Honors Program and transfer students should ask about modifications in the above schedule for the psychology majors. Students interested in combining a psychology major with the certificate program in Alcohol Studies should inquire at the office of the Department of Psychology.

MINOR IN PSYCHOLOGY. The minor in psychology may be certified after the completion of 90 semester hours, at the beginning of

*to be completed during the freshman and sophomore years.
the senior year. It requires 18 credit hours in psychology, of which at least 9 must be in upper-division courses.

Required Courses for the Psychology Minor:
A. Psych 101 or 102.
B. At least one psychology laboratory course. (3 hrs in either Psych 445 or Psych 498 may be substituted for the psychology laboratory course.)
C. Elective courses in psychology, to be chosen in consultation with a psychology faculty adviser.

Teaching Minor in Psychology. For the psychology minor for secondary school teaching, see Education section of this catalog.

Preparation for Graduate Study
Students who contemplate work leading to advanced degrees are urged to confer as early as possible with a psychology faculty adviser. Graduate programs in psychology require a solid background in mathematics, natural sciences, physics, philosophy, and social sciences as well as appropriate preparation in psychology itself.

Department of Sociology


Courses in sociology are designed to provide the student with a better understanding of what makes people and groups of people behave the way they do. Sociology studies the groups people form, the behavior and interaction of these groups, traces their origin and growth, and analyzes the influence of group activities on individual members. Some knowledge of sociology is generally regarded as a useful supplement to the course work in most fields. The course of study for majors is flexible enough to incorporate a variety of individual interests, such as deviance and criminology, the family, social welfare and social policy, and environmental sociology.

Majors may select one of three options for specialized study: I. General Sociology, II. Social Research and Data Analysis, or III. Social Welfare and Public Policy. These options are described below. The undergraduate sociology major provides excellent preparation for careers in a variety of occupations, including public relations, teaching, positions in government, social agencies, and industry; or as a foundation for graduate health administration, and counseling.

The department offers courses of study leading to the degrees of Bachelor of Arts in Sociology, Master of Arts in Sociology, and Doctor of Philosophy.

Description of Courses

For explanation see Index under "Symbols"

Sociology

Soc 101 [S] Introduction to Sociology 3 Basic principles for understanding human group relations; effects of social institutions such as families and schools on everyday life. Prereq for all courses listed below except Soc 102, 150, 198, 391.


150 [S] Marital and Sexual Life Styles 3 Traditional and alternative marriage styles; social and personal factors in mate selection; sexual life styles; development of sex roles.

198 [S] Sociology Honors 3

270 [S] Personal Identity and Social Interaction 3 Development of personal and social identities; social interaction and its effects on individual behavior; group dynamics, conformity, and influence.

320 Introduction to Social Research 3 Methods of collecting data; surveys, experiments, field observations; organization and interpretation of data; reading social research.

321 Quantitative Techniques in Sociology 4 Prereq Soc 320. Levels of measurement; measures of central tendency, dispersion and association; probability, normal curves; use of computer packages as learning tools.

330 [S] Communities 3 Social and environmental factors influencing community growth and decline; rural-urban differ-
ences; power structures; community influence on human well-being.

331 [S] Population, Resources and the Future 3 Effects of population on resource depletion, environmental deterioration, social and economic structure; zero population growth prospects; limits to growth debate.

340 [S] Social Inequality: Privilege and Poverty in America 3 Distribution of wealth, income, occupation and life chances; causes and consequences of inequality including welfare and tax systems.

341 [S] Sociology of Religion 3 Social sources and significance of religious beliefs and behavior, social organization of religious groups, and religion and social change.

342 [S] Political Sociology 3 Sociological analysis of political institutions and power structures; social and cultural basis of political behavior.

343 Sociology of Professions and Occupations 3 Relationship between work and social class, alienation, sexism, racism, poverty, disease and death.


351 [S] The Family 3 Prereq Soc 101 or Psych 101. The family system and its interaction patterns; family life cycle from marriage through death; marital success, sexuality, parenting, crises, abuse.


356 [S] Sociology of Aging 3 Age roles and role changes; problems of aging and the aged; relations between generations; death and dying.

360 Theories of Deviance 3 Sociological approaches to deviance; historical and contemporary theories and deviance issues.

361 [S] Criminology 3 Crime and society; theories of criminality, extent of crime, the criminal justice system, and prevention of crime and delinquency.

362 [S] Juvenile Delinquency 3 Sociological perspectives on delinquency; delinquent gangs and sub-cultures; delinquency causation and control; police, justice, and corrections as they affect youth.

364 [S] Law and Society 3 Prereq Crm J 101 or Soc 101. Analysis of impact of socio-cultural factors on emergence of law, concepts of justice and actual operation of the legal system.

365 Problems of Alcohol Addiction and Abuse 3 Same as Psych 365.

366 Problems of Alcohol Addiction and Abuse 3 Same as Psych 366.

371 Small Groups Analysis 3 Prereq 6 hrs Soc. Interpersonal relations in small groups: how stereotypes and social characteristics including sex, class, and race affect face-to-face behavior.

373 [S] Mass Communication and Public Opinion 3 Social history of print and broadcast media; communication and mass media; examines public opinion, propaganda, censorship, violence, conflict and change.

374 [S] Collective Behavior and Social Movements 3 Sociological basis of panics, riots, fads, and fashions; collective behavior as basis of social change and development of social movements.


384 [S] Sociology of Sex Roles 3 Biological and social causes and effects of sex role socialization; male/female relationships including discriminatory practices, prostitution, and rape.

391 Special Topics in Sociology 1-3 May be repeated for credit; cumulative maximum 6 hours.

410 Development of Social Theory 3 Prereq 6 hrs Soc. Biographical accounts and original writing of both early sociological masters and contemporary sociologists; history of U.S. sociology in social context.

420 Sociological Methods and Techniques 3 Prereq Soc 320, 321. The nature of social science research procedures; sampling, measurement, statistical research
design, and data analysis; scientific writing.

421 Quantitative Techniques in Sociology II 3 Prereq Soc 320, 321. Probability theory; inference theory; one and two sampling tests; regression and correlation analysis; log-linear models for contingency table analysis.


431 Environment and Society 3 Environmental problems, policies and controversies examined via sociological theory and research.

432 Energy and Society 3 Energy and societal evolution; energy consumption and quality of life; social impacts of energy shortages and alternative energy systems.

440 Organizations and Society 3 Problems in individual adaptation to organizations; structure of modern organizations; organizational conflict and change; interaction between organizations and their environment.

441 Education and Society 3 Education as a social institution; its relationship to socialization, social inequality, and social change.

446 Medical Sociology 3 Health care and rapidly increasing costs; relations among health care occupations; cure versus prevention; comparison with health care systems in other countries.

450 Family and Socialization 3 Prereq 6 hrs Soc or Psych. Socialization processes in the family and other social contexts; family patterns and their consequences for parent and child socialization.

451 Comparative Family Systems 3 Prereq 6 hrs Soc or Anth. Contributions of comparative family research and theory to the understanding of family structure, mate selection, marital interaction, and socialization.

461 Corrections 3 Prereq Soc 361. History, facilities, processes, and strategies for the correction of juvenile and adult offenders; prevention of crime and delinquency.

462 Human Issues in International Development 3 Same as Anth 462.

465 Juvenile Justice and Corrections 3 Same as Crm J 465.

499 Special Problems V 1-4 May be repeated for credit.

510 Theories of Social Organization 3 Major theories of social organization in historical perspective.

512 Theory Construction and Formalization 3 Testing; formalization of theoretical systems; adaptation of general models to specific problems.

514 Logic of Sociological Inquiry 3 Evaluation of issues from philosophy of science relevant to social research.

516 Development of Sociological Theory 3 Early theories of society; classic sociological theories of the 19th and early 20th centuries.

517 Seminar in Contemporary Sociological Theory 3 Recent developments in sociological theory, analysis, and appraisal of specific theoretical systems.

520 Research Methods in Sociology 3 Prereq Soc 420. Methodology of social research at the professional level.

521 Special Topics in Quantitative Techniques 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Soc 321, 421. Multiple and partial correlation and regression; factor analysis; advanced experimental design; categorical variables.

522 Advanced Sociological Methodology 3 May be repeated for credit; cumulative maximum 12 hours. Prereq Soc 421, 521. Scaling theory, sampling theory, experimental design, measurement of association, multivariate analysis, current methods and techniques.

523 Evaluative Research 3 May be repeated for credit. Prereq Soc 520, 521. Methodology of evaluation research of social programs: design, data collection, and analysis; field experience.

524 Sociology and Public Policy 3 Graduate level counterpart of Soc 424; additional requirements. Credit not granted for both Soc 424 and 524.

530 Demography 3 Prereq Soc 450. Population studies; causes, effects, and measurement of changes in fertility, mortality, and migration; population estimation and projection.

531 Human Ecology 3 Ecosystem context of human life; change viewed ecologically; sociological use and misuse of ecological concepts; issues in theory and research.

532 Environmental Sociology 3 Societal-
environmental interactions; impacts of human societies on the physical environment; environmental impacts on human behavior and social organization.

540 Complex Organizations 3 Elements of organization; methodologies for studying organizations; problems of organizational theory.

541 Sociology of Education 3 Interpretations of society as they affect roles of educational workers; sociological perspectives on the problems of education.

542 Theories of Social Stratification 3 Marx, Dahrendorf, Weber, Sorokin, Mills, Pareto; problems of stratification research; social class and social policy.

543 Social Impact Assessment 3 Sociology's contributions to environmental impact assessments; methods, contents and contexts of assessing social impacts of proposed developments.

544 Sociology of Religion 3 Role of religion in social structure, process and change; analysis of religious behavior.

545 Sociology of Community 3 Prereq Soc 330. Community stability and change: Interaction processes; decision-making; societal linkages; effects on well-being.

548 Political Sociology 3 Systematic survey of theories and the major research literature in political sociology.

550 Advanced Social Psychology 3 Same as Psych 550.

552 Practicum in Family Research V 1-4 May be repeated for credit; cumulative maximum 12 hours. Research design, measurement, data collection, analysis, and manuscript writing.

553 Social Organization and the Family 3 The family as a social institution; principles of social organization applied to family relationships; macro-level analyses of family structure.

554 Social Psychology of the Family 3 The family as an interacting group; social psychological theories and research applied to family relationships; effects of families on individuals.

555 Sex Roles in Society 3 Same as CFS 555.

556 Sociology of Aging 3 Theory and methods in social gerontology; effects of age and aging on human behavior and social interaction.

560 Problems of Deviance Theory 3 Development of theories of deviant behavior; new issues in the study of deviance.

561 Sociology of Law 3 Examination of social factors affecting the development and maintenance of legal structures and the processes of administration of justice.

566 Seminar in Deviant Behavior 2 May be repeated for credit.

567 Seminar in Crime and Delinquency 3 Contemporary theory and research in crime and delinquency.

568 Adolescent Alcohol Use and Abuse 3 Contemporary sociological theory and research in adolescent alcohol use and abuse; action programs, emerging issues.

571 Small Group Theory and Research 3 Theory and methods of small group research; types of groups, formation, and development of communication networks; socialization in group situations.

572 Socialization 3 Theories of childhood and adult socialization; personality development; symbolic interaction; learning; agents of socialization.

573 Behavioral Sociology 3 Sociological research and theory dealing with overt behavior of humans in social situations.

580 Race and Ethnic Relations 3 The nature of intergroup relations; processes and consequences of race and ethnic group contact. (a/y)

590 Seminar in Sociology 3 May be repeated for credit; cumulative maximum 9 hours.

591 The Sociology Profession 1 May be repeated for credit; cumulative maximum 2 hours. Requirements, operations, problems, and possibilities of the sociology profession.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Social Welfare and Public Policy

SW

190 Introduction to Social Work 3 The social worker in action; work with individuals, groups, communities; social work fields of practice.

390 Social Welfare and Society 3 Current social welfare programs; income maintenance, health services, corrections, public housing, child welfare; historical
development of social welfare programs.

Community Organization I: Political Processes 3 Theoretical and technical aspects of social legislation; its creation and impact; role of social worker in delivering services through government.

Community Organization II: Methods and Implementation 3 Prereq S W 393. Theory and practice in organizing community efforts to confront and deal with changing social problems.

Child Welfare 3 Social work practice in child welfare; adoption, foster homes, child protection, illegitimacy, group homes, day care, children’s institutions, dependency, delinquency.

Social Work Field Experience 15 Placement in a social agency; role of social worker; importance of knowing self; use of knowledge in helping relationships.

Social Work Theory and Methods I 3 Prereq S W 190. Social work values, ethics, skills; theoretical, and technical aspects of working with individuals, families, groups, and communities.

Social Work Theory and Methods II 3 Prereq S W 190, 493. Theoretical and technical aspects of contemporary theories of counseling; use of community resources, community change, social action.

Special Problems V 1-4 May be repeated for credit.

During the freshman and sophomore years, the student is advised to complete most or all of the graduation requirements of the College of Sciences and Arts. In addition, the following required and optional courses should be completed as indicated.

**Required Courses**
- Soc 101 Introduction
- Soc 320 Intro to Social Res
- Soc 321 Quant Tech I
- Soc 410 Dev of Social Th

**Hours**
- 3
- 3
- 4
- 3

**Recommended Courses**
- Soc 102 Social Problems
- Soc 270 Social Interaction
- Hist 110, 111, or 141, 142
- Pol S 101 American Govt
- Econ 201 Principles
- Anth 101 Introduction
- Psych 101 Intro Psych

**Hours**
- 3
- 3
- 6
- 3
- 4
- 3
- 3

**Option II. Curriculum in Social Research and Data Analysis**

Students wishing to pursue this curriculum will select courses in consultation with departmental advisers.

The student must complete the requirements specified under the first two years of the General Sociology Option, and should complete Soc 420 during the senior year. In addition the student should complete the following courses.

**Recommended Courses:** Math 201, 202; Phil 201, 380, 425; Cpt S 201, 320.

**Option III. Social Welfare and Public Policy**

This option is intended to provide students with appropriate training for employment in areas such as social welfare delivery services, public policy analysis, needs assessment, or social impact assessment. Two illustrative sequences are provided below: sequence one is in social welfare and sequence two in public policy. These sequences indicate the breadth considered desirable for employment in these two areas including: (a) general sociology, (b) research methods, (c) content specialization, and (d) field placement in a potential job setting. Other areas of content specialization can be developed by individual students with adviser approval.

**SOCIAL WELFARE**

The social welfare sequence is designed to educate students for responsible entry into the field of social work and the human services professions. Emphasis is given to the development of a generalist who can function effec-
tively in social service programs such as juvenile and adult corrections, mental health, child welfare, mental retardation, family counseling, geriatrics, community development and social action. Courses stress the development of a broad perspective on social problems and social problem solving to include the study of social policy formation and its impact.

Students must master an extensive body of knowledge from the social and behavioral sciences to gain an understanding of the complex nature of social welfare, the social policy underlying these programs, and the methods of working with individuals, families, groups, and communities. Students must also become familiar with the methods of social research and data analysis. A field placement under professional guidance enables students to integrate their knowledge and develop practical skills.

During the first two years students are encouraged to concentrate on meeting the General University Requirements. In the last two years they are heavily involved in the social welfare curriculum and related areas of study.

**Required Courses**

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<th>Course</th>
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<tr>
<td>Soc 101 Introduction</td>
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<tr>
<td>Soc 320 Intro Soc Research</td>
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<tr>
<td>Soc 321 Quant Tech I</td>
<td>4</td>
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<tr>
<td>SW 190 Intro Social Work</td>
<td>3</td>
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<td>SW 390 Soc Welfare and Society</td>
<td>3</td>
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<td>SW 393 Community Organization I</td>
<td>3</td>
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<td>SW 493 Theory and Methods I</td>
<td>3</td>
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<td>SW 494 Theory and Methods II</td>
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<tr>
<td>SW 490 Field Placement</td>
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**Recommended Courses**

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<td>Psych 101 Intro Psych</td>
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<td>Soc 351 The Family</td>
<td>3</td>
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<tr>
<td>Soc 330 Communities</td>
<td>3</td>
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<td>Soc 361 Criminology</td>
<td>3</td>
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<td>Soc 362 Juvenile Delinqu</td>
<td>3</td>
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<td>Psych 464 Exceptional Child</td>
<td>3</td>
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<td>Psych 445 Practicum</td>
<td>1-4</td>
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<td>SW 395 Child Welfare</td>
<td>3</td>
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<td>CFS 240 Child Dev and Guidance</td>
<td>3</td>
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<tr>
<td>Spe 405 Appl Interpersonal Com</td>
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**PUBLIC POLICY**

The public policy sequence is designed to provide an integrated approach to social and public policy as these relate to important social issues. Course work focuses upon those questions which the social sciences are best equipped to address: What is public policy? How is it formulated? How are policy alternatives evaluated? How are policy decisions implemented to accomplish desired outcomes?

In answering these questions emphasis will be placed on social science research findings. Students will also develop skills which enable them to assess community needs and the effectiveness of social programs. This involves understanding the nature and process of social research as these bear on areas of practical concern. This sequence also involves a field placement in which students examine the applicability of sociological methods, concepts, and research findings to policy formation and program evaluation.

During the first two years students are encouraged to concentrate on meeting the General University Requirements. In the last two years they are heavily involved in the public policy curriculum and related areas of study.

**Required Courses**

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<th>Course</th>
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<tr>
<td>Soc 101 Introduction</td>
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<td>Soc 320 Intro Soc Research</td>
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<td>Soc 321 Quant Tech I</td>
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<td>Soc 330 Communities</td>
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<td>Soc 431 Envir and Society</td>
<td>3</td>
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<tr>
<td>Soc 424 Soc and Public Policy</td>
<td>3</td>
</tr>
<tr>
<td>SW 390 Soc Welfare and Society</td>
<td>3</td>
</tr>
<tr>
<td>Pol S 440 Public Administration</td>
<td>3</td>
</tr>
<tr>
<td>SW 490 Field Placement</td>
<td>5-15</td>
</tr>
</tbody>
</table>

**Recommended Courses**

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soc 373 Mass Com Public Op</td>
<td>3</td>
</tr>
<tr>
<td>Soc 342 Political Soc</td>
<td>3</td>
</tr>
<tr>
<td>Soc 410 Dev of Social Theory</td>
<td>3</td>
</tr>
<tr>
<td>Soc 440 Organ and Society</td>
<td>3</td>
</tr>
<tr>
<td>SW 393 Community Organization I</td>
<td>3</td>
</tr>
<tr>
<td>Pol S 206 State and Local Govt</td>
<td>3</td>
</tr>
<tr>
<td>Pol S 416 Intro Policy Analysis</td>
<td>3</td>
</tr>
<tr>
<td>Econ 316 Urban and Reg Econ</td>
<td>3</td>
</tr>
<tr>
<td>Econ 340 Public Fin and Taxation</td>
<td>3</td>
</tr>
<tr>
<td>Econ 201 Contemporary Economics</td>
<td>3</td>
</tr>
</tbody>
</table>

**Soils**

R. L. Haulenbaur, Adviser. For instructional staff see Department of Agronomy and Soils.

The program offers courses of study on properties and uses of soils. The undergraduate courses provide background for work in practical soil management, in soil inventory, and in other selected areas, as well as preparation for advanced study.

The course of study leads to the degree of Bachelor of Science in Soils, Master of Science in Soils, and Doctor of Philosophy.
### Description of Courses

For explanation see Index under "Symbols"

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Prerequisites</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>201</td>
<td>Soils</td>
<td>Chem 102</td>
<td>Chemical, physical, and biological properties of soils.</td>
</tr>
<tr>
<td>301</td>
<td>Soil Management 1 Prereq Soils 201</td>
<td></td>
<td>Fertilizers, amendments, and soil reclamation; soil and water conservation; soils in land use planning and environmental quality control.</td>
</tr>
<tr>
<td>315</td>
<td>Fundamentals of Remote Sensing 1</td>
<td></td>
<td>Physical basis of remote sensing, characteristics of aerial photographs, reflectance from earth surface features.</td>
</tr>
<tr>
<td>316</td>
<td>Forestry Application of Airphoto Interpretation 1</td>
<td>Soils 315 or c/</td>
<td>Characteristics of aerial photographs, basic photogrammetry applied to forest management.</td>
</tr>
<tr>
<td>400</td>
<td>Soil Chemistry 3 Prereq Soils 201</td>
<td></td>
<td>Water quality, salt and pesticide migration, chemistry of soil use and modification, acid and alkaline soils, fertilizer reactions, agricultural pollution.</td>
</tr>
<tr>
<td>401</td>
<td>Soil Analysis 1 (0-3) Prereq Soils 400 or 402 or c/</td>
<td></td>
<td>Chemical characterization of soils for diagnostic purposes.</td>
</tr>
<tr>
<td>402</td>
<td>Soil Fertility 3 Prereq Soils 301</td>
<td></td>
<td>Plant nutrient requirements, principles of soil testing and tissue analyses, current fertilizer technology, fertilizer reactions in soils.</td>
</tr>
<tr>
<td>404</td>
<td>Soil Genesis, Morphology, and Classification 3</td>
<td>Soils 201</td>
<td>Soil profiles, soil-forming processes, and soil taxonomy. Field trips required.</td>
</tr>
<tr>
<td>406</td>
<td>Soil Inventory 3 (2-3) Prereq Soils 404</td>
<td></td>
<td>Design of mapping units and descriptive legends, inventory techniques and field practices, soil interpretations.</td>
</tr>
<tr>
<td>407</td>
<td>Soil Microbial Ecology 3 Prereq Bact 101 or 201</td>
<td>Chem 240; Soils 201</td>
<td>Basic aspects and significance of soil flora as related to soil ecology, plant growth, and environmental problems.</td>
</tr>
<tr>
<td>408</td>
<td>Soil Microbiology Lab 1 (0-3) Prereq Soils 407 or c/</td>
<td></td>
<td>Characterization of soil microbiota and microbial processes.</td>
</tr>
<tr>
<td>411</td>
<td>Physics of Soil-Water-Plant Relations 3 (2-3) Prereq Math 107; Soils 201</td>
<td></td>
<td>Water retention and transport in soil; water, structure, aeration, and temperature in relation to plant growth.</td>
</tr>
<tr>
<td>415</td>
<td>Remote Sensing Applied to Terrain Evaluation 3 (2-3) Prereq physical geology</td>
<td></td>
<td>Soil Mineralogy 3 Prereq Chem 217. Structures, properties, and identification</td>
</tr>
<tr>
<td>417</td>
<td>Introduction to Environmental Biophysics 2 Prereq Phys 102; Math 107.</td>
<td></td>
<td>Physical principles of biological environments, radiative energy transfer, turbulent transfer of momentum, heat, and water vapor in the lower atmosphere.</td>
</tr>
<tr>
<td>418</td>
<td>Environmental Biophysics Laboratory 1 (0-3) Prereq Soils 417 or c/</td>
<td></td>
<td>Experimental methods and procedures in environmental measurements; temperature, wind, radiation, and humidity measurements in biological environments.</td>
</tr>
<tr>
<td>460</td>
<td>Microbial Physiology 5 (3-6) Prereq Bact 201</td>
<td></td>
<td>Concepts of microbial physiology; growth, metabolism, regulation, variation, structural-functional relationships. Cooperative course taught at the University of Idaho. (a/y)</td>
</tr>
<tr>
<td>472</td>
<td>Remote Sensing of Environment 3 Basic remote sensing applied to inventory of</td>
<td></td>
<td>Special Problems V 1-4 May be repeated for credit.</td>
</tr>
<tr>
<td>499</td>
<td>Soil Colloidal Systems 3 Prereq Soils 400; Chem 217</td>
<td></td>
<td>Advanced Soil Chemistry 3 Prereq Soils 400; Chem 217. Chemical properties of soil colloidal systems. Joint listing with the University of Idaho. (a/y)</td>
</tr>
<tr>
<td>501</td>
<td>Advanced Soil Analysis V 1-3 May be repeated for credit; cumulative maximum 6</td>
<td></td>
<td>Advanced Soil Analysis V 1-3 May be repeated for credit; cumulative maximum 6 hours. By interview only. Soil research techniques; application of modern instrumentation to soil analysis.</td>
</tr>
<tr>
<td>504</td>
<td>Advanced Soil Genesis and Classification 3 (2-3) Prereq Soils 404. Genesis,</td>
<td></td>
<td>Fertilizer Science 3 (2-3) Prereq Soil 402. Manufacture, use, placement, and factors influencing choice of fertilizers. Greenhouse project required. Cooperative course taught at the University of Idaho. (a/y)</td>
</tr>
<tr>
<td>505</td>
<td>Soil Genesis and Classification 3 (2-3) Prereq Soils 404. Genesis, classification and interpretation of soils, including field investigation emphasizing existing interrelationships. Cooperative course taught at the University of Idaho. (a/y)</td>
<td></td>
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</tr>
</tbody>
</table>
of major clay minerals; solution equilibria and clay mineral weathering. (a/y)

Soil Organic Matter 2 Prereq Soils 400, 407. Formation, chemical properties, and significance of soil organic fraction. Cooperative course taught at the University of Idaho. (a/y)

Advanced Soil Biochemistry and Microbiology 2 May be repeated for credit; cumulative maximum 4 hours. Prereq Soils 400, 407; BC/BP 364. Biochemical and microbiological processes in soil-water environments; nutrient cycling; pesticide behavior; agricultural waste disposal; nitrogen fixation; advanced techniques.

Chemistry of Plant Nutrients 3 Prereq Soils 400; Chem 217. Chemistry of plant nutrients in soils, including uptake and utilization by plants. Cooperative course taught at the University of Idaho. (a/y)

Advanced Soil Physics 2 Prereq Soils 411. Physics of the soil-water system. (a/y)

Seminar 1 May be repeated for credit. Preparation of visual aids for presenting research information.

Advanced Topics in Soils 1 May be repeated for credit; cumulative maximum 4 hours. Prereq Soils 400, 404, 411. Analysis of current published research on soils, their uses, and management.

Advanced Remote Sensing 2 (1-3) Prereq basic remote sensing; digital computer programming. Digital image processing systems applied to satellite and other remote sensing systems. Cooperative course taught at the University of Idaho.

Advanced Aerial Photointerpretation 2 (1-3) or 3 (1-6) Prereq Soils 315, 316. Flight planning, interpretation of vegetation (disease and insect infestation), landforms, land use, pollution, temporal changes, photo mensuration multistage sampling. Cooperative course taught at the University of Idaho.

Special Projects or Independent Study Variable credit.

Master’s Research, Thesis, and/or Examination Variable credit.

Master’s Special Problems, Directed Study, and/or Examination Variable credit.

Doctoral Research, Dissertation, and/or Examination Variable credit.

General Departmental Requirements

A Bachelor of Science degree in Soils requires completion of the core requirements plus courses in one of the areas of specialization. At least 40 of the total hours required for the bachelor’s degree in this program must be in upper-division courses.

Core Requirements

The following courses are required of all soils majors. The list includes fundamental courses in soils, supporting courses in science and mathematics, and courses that fulfill General University Requirements: six hours each of Humanities, Social Sciences, and Communications; Soils 201, 301, 400, 401, 404, and 411; Chem 105, 106, and 217; Geol 102; Bio S 103; Bot 201 or Bio S 104; Bot 320; Bacc 201; Phys 101 or 201; and Math 107 or 140.

Areas of Specialization

All soils majors select an area of specialization under one of the following options:

Soil Management: This curriculum deals mainly with factors of the soil-plant environment important to agronomic plant production. Beyond the core requirements students should complete Chem 240; Ag M 344; Agron 305; Entom 340; PI P 329; Soils 402; 3 hours of Ag Ec; 2-4 hours Cpt S or Biom; 6 hours of plant production electives; and sufficient electives for a 120 hour total.

Soil Inventory: Soils as natural components of landscapes are emphasized in this curriculum. Students are trained in techniques of inventory and basics of field identification of soils and soil properties. They should complete, in addition to the core requirements, Soils 406, 415; Chem 240; Geol 306 and 310; Bio S 372; Bot 332, and 460 or 462; Ch E 174; 2-4 hours Cpt S or Biom; and sufficient electives for a 120 hour total.

General: Under this option, in consultation with an adviser, students specialize in an area other than soil management or soil inventory, e.g., soil biochemistry, soil microbiology, or land resource planning. Beyond the core requirements students should complete one course in Soils; one course in Math, Cpt S or Biom; 6 hours Chem, Phys, or Geol, or their equivalent; 11 hours of Bio S or their equivalent; and sufficient electives for a 120 hour total.
Preparation for Graduate Study

Preparation for graduate study implies the selection of courses that will benefit later work toward a Master of Science or a Doctor of Philosophy degree. Normally, preparation for an advanced degree in soils includes coursework outlined under one of the above options plus completion of Phys 102 or 202, Math 171 and, if not specified in the option, Chem 240.

Department of Speech

Professor and Department Chair, R. E. Potter; Professors, J. R. Franks, P. C. Wadeleigh, M. E. Wingate; Associate Professors, G. R. Caldwell, G. D. Chermak, C. L. Madison, C. R. Schneideman, R. G. Slabaugh; Assistant Professors, L. P. DeBruno, L. J. Farman, L. J. Harris, K. B. Kennedy; Instructors, J. E. Dengerink, P. Laikko, L. B. Larrigan, Z. A. Morgese.

The Department of Speech offers courses and major sequences in two areas: Communication Disorders and Theatre Arts and Drama. Courses are designed to provide an understanding of the various areas—their history, modes of operation, and place in a modern society—as well as a specialized education. Several courses within the department satisfy the General University Requirement in the humanities.

The Communication Disorders program provides academic course work and clinical practicum offerings which prepare professional personnel to meet the diagnostic and therapy needs of individuals of all ages evidencing a wide variety of speech, language, learning, and hearing problems. Students are also prepared to supply direct and ancillary services to such populations as the specific learning disabled, and other educational, paramedical, and medical disciplines which serve handicapped persons with communication disorders. Basically the academic and clinical training physiological and psychological processes of normal development, the fundamental communication processes, the disorders of communication, and the opportunity to demonstrate analytic and independent thought relevant to professional literature and clinical activity.

The Communication Disorders program is accredited nationally by the Education and Training Board of the American Speech-Language-Hearing Association and, on the state level, by the Office of the Superintendent of Public Instruction. Professional services, including free diagnosis and treatment programs, are available for all university students through the Communications Disorders Clinic. The Theatre Arts and Drama area offers a variety of courses and practical experiences to supply the student with the skills, critical judgment, and historical perspective necessary to attain excellence in the performance of period and contemporary plays. Students also may explore the uses of drama in educational and recreational settings. Emphasis may be placed in any of the following areas of concentration: acting/directing, technical theatre, history and criticism, and child drama. The University Theatre is the production arm of the Theatre Arts and Drama area.

The department offers courses of study leading to the degrees of Bachelor of Arts in Speech, Master of Arts in Speech, and Master of Arts in the Teaching of Speech. The Department also participates in the interdisciplinary programs leading to the degrees of Master of Arts in Child Development and the Doctor of Philosophy (American Studies).

Description of Courses

For explanation see Index under "Symbols"

General Speech Courses

Spe 160 (H) Introduction to Theatre 3 Drama as prepared and presented for the cinema, for television, and for the stage.

Spe 205 Introduction to Communication Disorders 3 (2-3) Defects of articulation, language, rhythm, and voice as they relate to public school and general populations.

Communication Disorders

Spe 118 Voice and Diction for Foreign Students 2 May be repeated for credit: cumulative maximum 4 hours. Instruction in production of the sounds and pattern of general American speech.

Spe 281 Manual Communication for the Deaf 2 Instruction and practical training in sign language for communication with the deaf.

Spe 371 Development of Speech and Language in Childhood 3 The normal development of language and speech; introduction to speech and language disorders in children and the role of the non-specialist.
Hearing and Hearing Disorders 2
Acoustic and psycho-physiologic aspects of normal hearing, and the nature and consequences of hearing disorders.

Phonetics 2
Acoustic and applied phonetics.

Clinical Methods I 3
Prereq Spe 205, 375. Organization of speech pathology programs in schools; methods of treatment for speech-handicapped children.

Anatomy and Physiology of the Speech Mechanism 4
Anatomical and physiological basis of speech production and the pathologies and aberrations that require the services of a Communication Disorders specialist.

Speech Science 2
Prereq Spe 205, 375. Scientific processes involved in and accompanying the speech act.

Introduction to Clinical Practice 2
Prereq Spe 376. Therapy methods and procedures in speech/language pathology audiology; state/federal laws affecting public school therapy.

Audiology 3 (2-3)
Prereq Spe 372. Principles and procedures in basic identification and assessment of hearing impairment; introduction to differential diagnosis of auditory pathologies.

Language and Learning Disability 3
Language and learning disabilities in children; the mentally retarded and neurologically disordered.

Stuttering 3

Clinical Practice V 1 (0-3) to 2 (0-6)
May be repeated for credit; cumulative maximum 4 hours. Prereq Spe 376, 471. Practicum in diagnosis and therapy for speech/language and hearing disorders.

Audiological Rehabilitation 3
Theories and methods involved in the audiological rehabilitation of the hearing impaired; use and care of hearing aids; counseling techniques.

Therapy for Language Delay and Disorders 3
Prereq Spe 371. Assessment and habilitation for the preschool and elementary-age child with language disorders.

Diagnosis and Appraisal of Speech Disorders 3
Prereq Spe 375, 471, 473. Principles, techniques, and materials involved in exploring the nature of speech disorders for planning a program of therapy.

Advanced Internship in Communication Disorders V 1-15
May be repeated for credit. Prereq Spe 475 or 575. Advanced practicum in diagnosis of and therapy for communication disorders.

Seminar in Speech Pathology 3
May be repeated for credit; cumulative maximum 9 hours. Exploration of ideas derived from current writings and research in speech pathology.

Hearing Aids and Advanced Rehabilitative Audiology 3
Prereq Spe 372, 472, 477. Hearing aid technology, evaluation and fitting; counseling in the rehabilitative/rehabilitative process; rehabilitative considerations for the geriatric population.

Cleft Palate 3
Prereq Spe 205, 377. Speech and voice problems associated with clefts of the lip and palate.

Aphasia 3
Prereq Spe 205, 377, 478. Speech and language disabilities associated with brain injury.

Advanced Clinical Practice V 1 (0-3) to 3 (0-9)
May be repeated for credit; cumulative maximum 6 hours. Advanced clinical practice in evaluation and treatment of speech, language, and learning disorders.

Voice Disorders 3
Prereq Spe 205, 377, 378. Functional and organic voice disorders resulting from various etiologies.

Auditory Perception 3

Seminar in Audiology 3
May be repeated for credit. Explanation of ideas derived from current writings and research in selected aspects of audiology.

Advanced Diagnosis of Communication Disorders 3
Prereq Spe 480. Rationale, professional literature, and practical application relative to differential diagnosis and current technology in assessment of communication disorders.

Developmental Psycholinguistics 3
Prereq Spe 205. The nature of children's language and theories of language and speech development.

Advanced Audiometric Procedures 3
Prereq Spe 472. Behavioral and physiological principles and procedures in audiology for the differential diagnosis of auditory pathologies; considerations for geriatric clients.

Hearing Conservation in Industry and

586 Pediatric Audiology 3 Prereq Spe 472. Auditory behavior and pathologies in children; procedures for assessment and application to others who are difficult to test.

588 Phonological Acquisition and Behavior 3 Prereq Spe 376. Current literature in articulatory development and deviancy; diagnosis and therapy. (a/y)

Theatre Arts and Drama

Spe

163 (263) Beginning Stagecraft 3 (2-3) Basic techniques of scenery construction and painting in the performing arts; practical application with University Theatre productions.

260 Beginning Acting 3 (1-6) Basic principles and techniques of acting; developing creativity through exercises for body, mind, voice.

263 (265) Stage Costuming 3 (2-3) Basic costume construction techniques, sewing skills, measurement, patterns, fabrics, draping for the stage.

264 Stage Makeup 1 (0-3) Basic techniques in the design and execution of makeup for the stage and television.

296 University Theatre Practicum I 1 (0-3) May be repeated for credit; cumulative maximum 4 hours. Supervised backstage production work: scenery, costumes, lights, box office, publicity.

360 Acting II 3 Prereq Spe 260. By interview only. Continuation of Spe 260. Use of gesture, movement, timing to develop character and sustain emotion; representative scenes used.

361 Fundamentals of Play Directing 3 (2-3) Prereq Spe 260. For juniors and seniors. Theories of directing: principles of composition, blocking, casting, organization, and rehearsal; scene rehearsals and presentation.

362 [H] Structure of Drama 3 Aristotelian analysis of four plays, a musical, and a film; fiction, character, thought and language as means to author's vision.

363 Lighting for the Theatre 3 (2-3) Design and execution of lighting for the performing arts; instruments, control systems, principles of electricity, optics and color; required practicum.

364 Creative Dramatics 3 Not open to students required to take Spe 206. Philosophy and techniques of informal drama; elementary classroom and other uses.

365 [H] Theatre History I: Beginnings to 1700 3 Development of theatre and drama from its beginning to 1700; major trends, playwrights, plays.

366 [H] Theatre History II: 1700 to 1900 3 Development of theatre and drama from approximately 1700 to 1900; major developments in theatre arts and dramatic literature.

368 Visual Communication in Theatre, Film and Television 3 Analysis of the visual aspects of theatre, film and television applying research in perceptual psychology. (a/y)

396 University Theatre Practicum II 1 (0-3) May be repeated for credit; cumulative maximum 4 hours. Prereq Spe 296. For non-majors only. Supervised backstage production work: scenery, costumes, lights, box office and publicity.

450 Advanced Techniques of Acting 3 May be repeated for credit; cumulative maximum 6 hours. Prereq Spe 360. Preparation for performance and individual character study for the advanced student of acting.

460 Evolution of Theatre Design 3 Prereq Spe 365, 366. Visual styles in theatrical productions; development of the modern stages; design approaches to period plays. (a/y)

461 Play Directing II 3 (2-3) Prereq Spe 361, 362. Not open to juniors. Continuation of Spe 361. Directors as "conductor;" tempo, pace, mood; scene rehearsals and presentation.

462 Stage Scenery and Properties Studio 2 (0-4) Prereq Spe 163. Advanced projects in stage scenery and properties; solving design and technical problems for theatrical productions.

463 Seminar in Theatre Design 3 May be repeated for credit; cumulative maximum 9 hours. Visual elements in the performing arts; appropriate for designers, directors, performers; individual drawing skills are taken into account.

464 Stage Lighting and Sound Studio 2 (0-4) Prereq Spe 363. Advanced projects in stage lighting and sound; solving design and technical problems for theatrical productions.

465 Historic Costume for the Stage 3 History of western world costume with
emphasize on contemporary stage adaptation.

466 Stage Costume Studio 2 (0-4) Prereq Spe 163. Advanced projects in stage costing; solving design and construction problems for current theatrical productions.

467 Seminar in Drama 3 May be repeated for credit; cumulative maximum 6 hours. Individualized study and discussion of drama from different eras; sources and treatment, analysis of plays as scripts.

468 Children's Theatre 3 Theories, dramatic literature and production demands of theatre for children and youth.

494 Acting: Rehearsal and Performance V 1-3 May be repeated for credit; cumulative maximum 6 hours. By interview only. Practical application of acting techniques during the production of plays.

496 University Theatre Practicum III 1 May be repeated for credit; cumulative maximum 6 hours. Prereq junior or senior theatre major. Students will perform duties involving responsibility in shops and supervision of other students in production crews.

521 Repertory Theatre 3 May be repeated for credit; cumulative maximum 9 hours. By audition only. Rehearsal and performance and related technical and management work in Summer Palace Repertory Theatre.

541 History of the Theatre 3 Major developments of all aspects of theatre arts from preliterate times to 1650. (a/y)

542 History of the Theatre 3 Major developments of all aspects of theatre arts from 1650 to 1800. (a/y)

561 Seminar in the Theory of Play Directing 3 (2-3) Prereq Spe 361. Theory of contemporary directing practice. (a/y)

565 Seminar in Drama 3 May be repeated for credit; cumulative maximum 6 hours. Seminar in various periods, movements, and phases of drama.

566 The Theory of Drama 3 The nature and structure of drama.

568 Seminar in Theatre 3 May be repeated for credit; cumulative maximum 6 hours. Research in a specific area of theatre.

Special Problems and Research

Spe 499 Special Problems V 1-4 May be repeated for credit.

501 Research Methods in Speech 3 Theory, methods, and practice of research.

504 Instructional Practicum I May be repeated for credit; cumulative maximum 4 hours. Instruction and guidance in teaching the basic course in Speech.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies

At least 45 of the total hours required for the bachelor's degree in this program must be in upper-division courses.

Area Sequences

1. Communication Disorders:

   The speech pathology program is accredited by the Education and Training Board—American Board of Examiners in Speech Pathology and Audiology, American Speech, Language, and Hearing Association.

   (a) Speech Pathology:


   (b) Audiology


   (c) For program options, see Department of Education.

2. Theatre Arts and Drama:

   (a) 13 hours of Performance: Spe 250, 260, 360, 361, and 264.

   (b) 18 hours of Dramaturgy: Spe 362, 365, 366, 467, and 6 hours of approved literature electives.
(c) 15 hours of Design/Tech: Spe 163, 263, 363, 465, and 460 or 368.
(d) 6 hours of Practicum: 2 hours of Spe 296, 2 hours of Spe 496, and 2 hours of Spe 494.

3. Speech Education Major: See listings under the Department of Education.

Preparation for Graduate Study
Students with undergraduate majors in child development, the humanities, education, the social and behavioral sciences, as well as those with undergraduate majors in speech, may be accepted for graduate study in this department.

College of Veterinary Medicine

The College of Veterinary Medicine offers courses of study leading to the degrees of Doctor of Veterinary Medicine, Bachelor of Science in Veterinary Science, Master of Science in Veterinary Science, and Doctor of Philosophy. Additional information, including requirements for admission, is contained in the general information section of this catalog.

The College of Veterinary Medicine at Washington State University is accredited by the American Veterinary Medical Association.

The following program is an outline of the minimum requirements necessary for application to professional study in the College of Veterinary Medicine. However, only a few exceptional students are accepted with this abbreviated background. The average student accepted in recent years has completed 120 hours (4 years) and maintained in excess of a "B" average in preprofessional college or university study.

Preveterinary Requirements

1. Communication Proficiency (three hours must be in written communication)  
   Hours
   6

2. Arts and Humanities
   6

3. Social Sciences
   Courses to meet the above requirements must be selected from the list under the General University Requirements for graduation section of the WSU catalog.
   45

4. Physical and Biological Sciences
   Except under unusual circumstances applicants will be expected to have completed courses as indicated in each of the following: chemistry including organic and biochemistry; mathematics (college level algebra); applied animal nutrition; physics including electricity, optics and sound; zoology or general biology.
   12

Total Hours Required 75

Bachelor of Science Degree in Veterinary Science

The Bachelor of Science degree in Veterinary Science combines credit earned in the preveterinary curriculum and a minimum of 34 credits in the professional program. This degree was designed to benefit veterinary students in obtaining employment, applying for scholarships, and qualifying for graduate-level course enrollments. Students completing a minimum of 120 semester hours should contact the Associate Dean, Student Services for complete information.

The minimum basic requirements for the degree are:

Social Sciences, Arts and Humanities  
   Hours
   (not less than 6 hours in each field) 12

Communications Proficiency
   6

Physical and Biological Sciences and Recommended Electives
   42

60 additional hours of acceptable university credit of which 34 hours must be 300-level or above courses in the professional curriculum of the College of Veterinary Medicine

Total semester hours 120

Schedule of Studies

Professional Curriculum

The professional curriculum for the Doctor of Veterinary Medicine degree is outlined below. Two areas of concentration options are offered: Practice Option and Veterinary Science Option. A minimum of 16 semester hours of option courses must be added to the core of 124 semester hours necessary for graduation. A total of 140 semester hours are required for graduation. All courses required in the professional program are upper-division courses.

First Year

First Semester

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>V An 401 Gross Anatomy</td>
<td>4</td>
</tr>
<tr>
<td>V An 405 Microanatomy</td>
<td>7</td>
</tr>
<tr>
<td>V Ph 356 Vet Prof Or</td>
<td>1</td>
</tr>
</tbody>
</table>

306
### Preparation for Graduate Study

Students meeting the requirements of the Graduate School and having the Doctor of Veterinary Medicine degree or a bachelor's degree in allied fields may take work leading to an advanced degree in the College of Veterinary Medicine. Students without the DVM degree will take courses in preclinical fields (anatomy, microbiology, pathology, physiology, parasitology, and pharmacology).

The undergraduate preparation should include two semesters of organic chemistry or one semester of organic chemistry and one semester of physiological chemistry; one year of general physics and one semester of college algebra; one semester of comparative vertebrate anatomy and one semester of physiology.

A combined degree program is available which allows simultaneous pursuit of both DVM and graduate degrees. Admission to the College of Veterinary Medicine and to the Graduate School are prerequisite for entry into the combined degree program.

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### Department of Veterinary and Comparative Anatomy, Pharmacology, and Physiology

**Professor and Acting Chair, W. M. Dickson.**

**Anatomy:** Professors, V. K. Reddy, C. S. Zamora; Associate Professor, M. H. Ratzlaff; Assistant Professors, R. H. Finnell, J. W. Newbrey, M. W. Pernol, T. L. Spurgeon.

**Pharmacology and Toxicology:** Professors, J. O. Dickinson, P. A. Klevano, L. D. Koller, R. I. Kreiger; Associate Professor, R. E. Borchard,

**Physiology:** Professors, L. K. Bustad, W. M. Dickson, K. M. Meyers; Associate Professors, K. B. Campbell, R. C. Ritter, W. S. Ritter; Assistants Professor, J. W. Harding.

#### Description of Courses

For explanation see Index under "Symbols"

**Anatomy**

V An 308 Functional Anatomy of Domestic Animals 3 (2-3) Prereq Chem 102; Bio S 104. For majors in the College of Agri-
culture. Macroscopic functional morphology of domestic animals.

350 Skeletal Preparation V 1-3 May be repeated for credit; cumulative maximum 3 hours. Technique of skeletal preparation.

401 Veterinary Anatomy 4 (1-9) Prereq admission to Vet Med or graduate student in Vet S. Detailed macroscopic functional morphology of domestic animals.

402 Veterinary Anatomy 4 (0-12) Prereq V An 401. Detailed macroscopic functional morphology of domestic animals.

405 Microscopic Anatomy 7 (3-6) Prereq admission to Vet Med or graduate student in Vet S. Microscopic functional morphology of the cell, tissue, and selected organ systems in domestic animals.

413 Advanced Anatomy 3 (1-6) May be repeated for credit; cumulative maximum 6 hours. Prereq V An 402, 406. Microscopic and gross anatomy of selected organ systems.

423 Veterinary Neuroscience 3 (2-3) Prereq V An 401; V Ph 417. Structure and function of nervous tissues; relationship of neurophysiology and neuroanatomy to clinical medicine.

499 Special Problems V 1-4 May be repeated for credit.

511 Applied Anatomy of Large Animals 2 (1-3) Prereq V An 402. Applied anatomy of large animals including surgical anatomy.


513 Advanced Neuroanatomy 3 (1-6) Advanced gross and microscopic anatomy of the nervous system and organs of special sense. (a/y)

550 Research Principles and Methods of Anatomy 1 (0-5) May be repeated for credit; cumulative maximum 3 hours. Prereq graduate student in Vet S. Exposure to research performed in the laboratory of each anatomy faculty member.

592 Seminar 1 May be repeated for credit.

600 Special Projects or Independent Study Variable credit.

700 Master’s Research, Thesis, and/or Examination Variable credit. (For masters in veterinary science only.)

800 Doctoral Research, Dissertation, and/or Examination Variable credit. (For PhD in veterinary science only.)

Pharmacology and Toxicology

V Ph

356 Professional Orientation 1 Orientation of first year professional DVM students to the profession of veterinary medicine.

523 Special Topics in Veterinary and Comparative Pharmacology 1 (0-3) Prereq V Ph 531. Practical veterinary pharmacology techniques and clinical application.

531 Veterinary and Comparative Pharmacology 4 (3-3) Prereq 2nd year in Vet Med. Introduction to pharmacology; pharmacodynamics and the pharmacology of the systems of domestic animals.

532 Veterinary and Comparative Toxicology 2 Prereq 2nd year in Vet Med; V Ph 531. Toxicology of various toxicants.

533 Veterinary and Comparative Pharmacology and Toxicology 4 (3-3) Prereq V Ph 531, 532. Continuation of V Ph 531, 532.

545 Pesticide Chemistry and Toxicology 4 (3-3) Same as Entom 545.

561 Advanced Pharmacology 3 Same as Phar 561.

562 Advanced Pharmacology 3 Same as Phar 562.

592 Seminar 1 May be repeated for credit.

600 Special Projects or Independent Study Variable credit.

700 Master’s Research, Thesis, and/or Examination Variable credit. (For masters in veterinary science only.)

800 Doctoral Research, Dissertation, and/or Examination Variable credit. (For PhD in veterinary science only.)

Physiology

V Ph

499 Special Problems V 1-4 May be repeated for credit.

517 (417) Mammalian Control Systems 5 (4-3) Cellular, neural, and endocrine control systems in physiology.

518 (418) Veterinary Physiology 5 Prereq V Ph 517. Physiology of domestic animals.

520 Techniques in Mammalian Physiology 2 (1-3) Use of anesthetics and surgery. (a/y)

521 Cardiorespiratory Systems 3 (2-3) A system and quantitative treatment of physiological processes in the heart, blood vessels, and lungs. (a/y)
526 Veterinary Physiology Laboratory 2
(0-6) Prereq admission to Vet Med. Laboratory exercises illustrating the
physiology of domestic animals.
528 Behavioral Mechanisms in Physiology
3 Examination of the physiological
transduction mechanism which enable
animals to interact behaviorally with
their environment. (a/y)
529 Neurochemistry 3 Prereq Biochem.
Basic biochemical processes in the ner-
vous system and their significance for
normal and abnormal function. (a/y)
530 Neurochemical Techniques 1 (0-3) Pre-
req c/ / in V Ph 529. Techniques of
major importance to the study of func-
tional neurochemistry. (a/y)
535 Pathophysiology of Blood 3 (2-3) Phys-
iology of erythron, hemostatic system
and effector; cells including granulo-
cytes and natolar killer cells. (a/y)
592 Seminar 1 May be repeated for credit.
600 Special Projects or Independent Study
Variable credit.
700 Master’s Research, Thesis, and/or Ex-
amination Variable credit (For masters
in veterinary science only.)
800 Doctoral Research, Dissertation, and/
or Examination Variable credit. (For
PhD in veterinary science only.)

Department of Veterinary
Clinical Medicine
and Surgery

Professor and Department Head, J. E. Alex-
ander; Professors, P. B. Anderson, P. K. Brack-
en, D. F. Brobst, G. M. Bryan, O. L. Frost,
C. C. Gay, B. D. Grant, J. W. Kramer, R. L.
Ott, G. D. Pettit, J. D. Robinette, R. D. Sande;
Associate Professors, J. F. Evermann, W. D.
Mickelsen, J. B. Miller, L. G. Paisley, N. W.
Rantanen, E. Stauker, K. K. White; Assistant
Professors, D. D. Barbee, W. M. Bayly, C. H.
Boulton, J. A. Chalman, C. R. Dhein, L. V.
Gallagher, P. R. Gavin, K. H. Haupt, J. D.
Lincoln, S. M. Parish, L. M. Paulsen, S. M.
Reed, R. L. Torbeck, L. L. Wood.

Description of Courses

For explanation see Index under "Symbols"

V MS
261 Accidents and Diseases 3 Majors in the
College of Agriculture. Common dis-
eases and injuries of farm animals.
377 Large Animal Clinic Orientation 1
(0-3) Prereq 3rd year in Vet Med. The
restraint of large animals, examination
techniques, administration of medica-
ments, and surgical dressing.
460 Laboratory Diagnosis 3 (2-3) Prereq
2nd year in Vet Med. Laboratory di-
agnostic procedures and interpretation.
461 Large Animal Medicine I 5 Prereq 3rd
year in Vet Med. Diagnosis and treat-
ment of large animal noninfectious
diseases.
462 Large Animal Medicine II 5 Prereq
VMS 461. Diagnosis and treatment of
large animal infectious diseases. Con-
tinuation of V MS 461.
463 Small Animal Medicine I 4 Prereq 3rd
year in Vet Med. Diagnosis and treat-
ment of small animal diseases.
464 Small Animal Medicine II 5 Prereq
V MS 463; Diagnosis and treatment of
small animal diseases. Continuation of
V MS 463.
471 Introduction to Surgery 1 Prereq 2nd
year in Vet Med. Wound healing and
introduction to surgical instrumentation,
techniques and organization.
472 Surgery I 4 (3-3) Prereq 3rd year in
Vet Med. Principles of surgical tech-
niques and small animal surgery.
473 Surgery II 3 (2-3) Prereq V MS 472.
Large animal surgical techniques.
477 Theriogenology 3 Prereq V MS 462.
Diagnosis, symptomatology, and treat-
ment of reproductive disorders.
478 Theriogenology Laboratory 1 (0-3) Pre-
req c/ / in V MS 477.
481 Radiology 3 Prereq 2nd year in Vet
Med. Introduction to radiography and
diagnostic radiology.
484 Veterinary Practice Management 2 Pre-
req 3rd year in Vet Med. A correlation
of the veterinary medical and business
aspects of practice management.
485 Diseases and Management of Pet and
Wild Birds 2 (1-3) Prereq junior in Vet
Med. Management and handling, diag-
osis and treatment of various disease
conditions of pet and wild birds.
489 Large Animal Preventive Medicine 3
Prereq 3rd year in Vet Med. Veterin-
arian’s role in the interrelationship be-
tween management disease and produc-
tivity, and the quality of the marketed
food or product.
499 Special Problems V 1-4 May be repeat-
ed for credit.
560  Small Animal Medicine 4 (0-12) Prereq 4th year in Vet Med. Theory and practice of small animal medicine; hospital rotation in all phases.

561  Small Animal Medicine Elective 4 (0-12) Prereq V MS 560. Theory and practice in specialized diagnostic procedures; hospital rotation.

562  Small Animal Medicine 4 (0-12) Same as V MS 560.

565  Small Animal Surgery 4 (0-12) Prereq 4th year in Vet Med. Surgical cases in clinic, ward rounds, case discussions by students, seminars by faculty, designed surgical exercises.

566  Small Animal Surgery Elective 4 (0-12) Prereq V MS 565. Clinical cases; additional designed surgical exercises.

567  Small Animal Surgery 4 (0-12) Same as V MS 565.

570  Equine Medicine and Surgery 4 (0-12) Prereq 4th year in Vet Med. Clinical surgery, treatment and care of patients; clinical rounds; exercises in surgery, lameness and diagnosis procedures.

571  Equine Medicine and Surgery Elective 4 (0-12) Prereq V MS 570. Advanced surgery and lameness, and advanced medicine; independent study; audiovisual aids.


576  Advanced Food Animal Medicine and Surgery 4 (0-12) Prereq V MS 575. Independent study; audiovisual aids. Cooperative course taught by the University of Idaho (Caldwell).

577  Advanced Theriogenology 4 (0-12) Prereq V MS 575. Reproductive herd health in cattle and swine; diagnostic techniques related to infertility.

580  Food Animal Preventive Medicine 4 (0-12) Prereq V MS 575 or 576. Preventive medicine and environmental impact on animal confinement; agribusiness, ruminant nutrition, management practice. Cooperative course taught by the University of Idaho (Caldwell).

582  Seminar in Clinical Medicine 1 May be repeated for credit.

587  Hospital Rotation 3 (0-9) May be repeated for credit; cumulative maximum 6 hours. Prereq DVM degree. Supervised practical experience in all service areas of the veterinary hospital.

589  Advanced Clinical Veterinary Medicine 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq DVM degree. Special topics.

590  Externship V 1-4 May be repeated for credit; cumulative maximum 4 hours. Prereq 4th year in Vet Med. Theory of practice of veterinary medicine in a non-university situation.

591  Advanced Clinical Diagnosis V 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq DVM degree. Advanced course in system's clinical and laboratory examination.

592  Seminar I May be repeated for credit.

593  Advanced Large Animal Surgery 3 (1-6) Prereq DVM degree. An advanced course in equine surgical techniques.

594  Advanced Small Animal Surgery 3 (2-3) May be repeated for credit; cumulative maximum 6 hours. Prereq DVM degree. Clinical experimental techniques.

595  Advanced Laboratory Diagnosis 2 (1-3) Prereq DVM degree. Advanced clinical laboratory diagnosis and interpretation.

596  Advanced Radiology 2 (1-3) Prereq DVM degree. Advanced study in the field of veterinary radiology and radiation treatment.

600  Special Projects or Independent Study Variable credit.

700  Master's Research, Thesis, and/or Examination Variable credit. (For masters in veterinary science only.)

800  Doctoral Research, Dissertation, and/or Examination Variable credit. (For PhD in veterinary science only.)

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Department of Veterinary Microbiology and Pathology


Description of Courses

For explanation see Index under "Symbols"

Veterinary Microbiology

V Mic

430 Veterinary Immunology 3 (2-3) Prereq major in Vet Med or graduate student in Vet S. Immunology for the professional veterinary student.

431 Veterinary Virology 3 (2-3) Prereq major in Vet Med or graduate student in Vet S. Virology for the professional veterinary student.

432 Veterinary Bacteriology 3 (3-6) Prereq V Mic 431. Bacteria that produce disease in animals.

433 Veterinary Medicine and Human Health 3 Prereq 2nd year in Vet Med. Prepares undergraduate veterinary students in public health, epidemiology, and food hygiene.

435 Disease Concepts for Wildlife Biologists 4 Biologic aspects of infectious diseases and environmental contaminants in wild mammalian and avian populations.

436 Diseases of Commercial Fowl 3 (1-6) Prereq V Mic 432; V Pa 446. Diagnosis, control, and treatment of diseases in domestic fowl.

499 Special Problems V 1-4 May be repeated for credit.

531 Advanced Immunology 3 Prereq V Mic 430 or Bact 412. Analysis of the immune response. (a/y)

532 Virology 4 (3-3) Prereq V Mic 431 or Bact 414 and BC/BP 364. Advanced topics in basic virology. (a/y)

533 Advanced Veterinary Diagnostic Bacteriology 2 (0-6) May be repeated for credit. Prereq V Mic 432 or Bact 310. Isolation and identification of bacterial and mycotic agents in diseased organs and tissues of animals.

534 Viral and Rickettsial Diseases of Animals 3 Prereq V Mic 431. Pathogenesis of viral and rickettsial disease. (a/y)

535 Advanced Readings in Veterinary Microbiology 1 (0-3) May be repeated for credit. Prereq senior in Vet Med or graduate student in Vet S. Supervised reading program which peruses publications of intermediate technical difficulty and advanced textbooks.

536 Diagnostic Microbiologic Conference 1 (0-3) May be repeated for credit. Prereq graduate student in Vet S. Identification of animal pathogens in clinical material.

537 Diagnosis of Viral and Rickettsial Diseases of Domestic Animals 3 (1-6) Prereq V Mic 430, 431; V Pa 446. Clinical, pathological, and laboratory diagnosis of viral and rickettsial diseases of domestic animals.

542 Diseases of Wildlife 2 Prereq junior in Vet. Management principles, epidemiology, pathology, treatment, and control of diseases in wild birds, fish, and mammals.

592 Seminar 1 May be repeated for credit.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit. (For masters in veterinary science only.)

800 Doctoral Research, Dissertation, and/or Examination Variable credit. (For PhD in veterinary science only.)

Veterinary Pathology

V Pa

444 Small Animal Pathology 3 (2-3) Prereq V Pa 446. Pathology of diseases of small pet animals.

445 General Pathology 4 (3-3) Prereq V An 406, V Ph 418. Structural and functional alterations in disease; elementary oncology.


447 Gross Pathology Conference 1 (0-3) May be repeated for credit. Prereq V Pa 445 or c/. Review of current necropsy cases; experience in performing necropsies.

449 Pathology of Large Animal Diseases 3 (2-3) Prereq V Pa 446. Diseases of cattle, horses, swine, and sheep; diagnosis at necropsy.

451 Veterinary Parasitology 5 (4-3) Prereq soph in Vet. Arthropods, protozoa, and helminths of veterinary importance; their host-parasite relationship and control.

454 Special Animal Medicine 3 Prereq junior in Vet. Handling, restraint, care, normative features, procedures and dis-
cases of unusual animals as pets or those used in food production or research.

499 Special Problems V 1-4 May be repeated for credit.

542 Advanced Diagnostic Pathology V 1 (0-3) to 4 (0-12) May be repeated for credit; cumulative maximum 8 hours. Prereq V Pa 445, 446. Necropsy laboratory for techniques and skills in performing and interpreting necropsy material.

543 Laboratory Animal Pathology 3 May be repeated for credit; cumulative maximum 6 hours. Prereq V Pa 454. (a/y)

544 Immunopathology 3 (2-3) Prereq V Mic 531; V Pa 445. The role of immune processes in the pathogenesis of disease. (a/y)

545 Mechanisms of Disease 5 Prereq V Pa 445; V Mic 450 or Bact 412. Biochemical and immunological mechanisms involved in disease processes from the comparative standpoint.

546 Advanced Reading in Veterinary Parasitology 1 May be repeated for credit. Prereq graduate or advanced undergraduate. Selective reading program under tutorial guidance for important topics in veterinary parasitology.

547 Advanced Veterinary Parasitology 3 Prereq graduate or advanced undergraduate. Mechanisms involved in host-parasite relationship important to control of parasitic infections. (a/y)

548 Seminar in Experimental Pathology 1 May be repeated for credit.

581 Advanced Services 4 (0-12) Prereq 4th year in Vet Med. Advanced study in diagnostic pathology and microbiology.

592 Seminar 1 May be repeated for credit.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit. (for masters in veterinary science only.)

800 Doctoral Research, Dissertation, and/or Examination Variable credit. (for PhD in veterinary science only.)

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**Department of Vocational Technical Education**

*Professor and Department Head, W. A. Bakamis; Professors, J. G. Cunnea, A. D. Hill; Associate Professors, M. M. Oaks, B. L. Trout; Assistant Professors, W. L. Holmes, B. J. Johnson, M. D. Kleene, R. R. Murphy, M. L. Riggers.*

The Department of Vocational Technical Education administers Agricultural Education, Home Economics Education, and Industrial Technology. The curriculum in each of the three areas is designed to prepare students for careers in education and a wide variety of occupations in government, business, and industry. Theoretical and applied laboratory methods in vocational technical education are combined with externships and internships. Technical courses are also offered in the College of Agriculture, Home Economics, Engineering, and in the Departments of Fine Arts and Business Administration.

The department offers courses of study leading to the degrees of Bachelor of Science in Agricultural Education, Bachelor of Science in Home Economics, and Bachelor of Arts in Industrial Technology. The department also offers courses leading to the Master of Science degree in Vocational Technical Education. All graduate students are required to complete a common core of courses and have the option of specializing in a designated field of interest. Additional work in related fields may be taken in other WSU Departments or through exchange courses with the University of Idaho.

**AGRICULTURAL EDUCATION**

Students who wish to qualify as teachers of Vocational Agriculture in high schools may do so by meeting the requirements for a Bachelor of Science degree in Agricultural Education. Before the end of the sophomore year, the student should certify a major in Agricultural Education. The student must have a 2.00 grade point average and meet the requirements of the Department of Education. (See Department of Education.) Minimum requirements for the Provisional Certificate and the certificate in Vocational Agriculture are met through the schedule of studies given below.

**Schedule of Studies**

At least 40 of the total hours required for this degree must be in upper-division courses, with
at least 20 hours in Agriculture. Students electing a major in Agricultural Education must complete at least 6 hours in Communications Proficiency, 6 hours in Arts and Humanities, 6 hours in Social Sciences, 3 hours in Mathematics (or show competency in mathematics), 8 hours in Biological Sciences, 8 hours in Physical Sciences, 31 hours in Education, 1 hour in safety education and a First Aid Card. At least 45 semester hours in agricultural science must be earned. These requirements will vary depending on the option selected.

A program in Agricultural Education has four options available: Production Agriculture—Mechanics, Production Agriculture—Business, Agricultural Resources—Forestry, and Horticulture. All options require a total of 120 semester hours for graduation.

**PRODUCTION AGRICULTURE—MECHANICS**

**Freshman Year**

**First Semester**

- A S 101 An Sciences 3
- Agron 101 Fld Crop Sci 3
- Chem 101 Intro Chem 4
- Engl 101 Composition 3
- Psych 102 Hum Behavior 3

**Second Semester**

- Chem 102 Chem Rel Man 4
- Hort 101 Plts & Gard 3
- Hum Elective 3
- Math 101 or Elective 3
- Spe 112 Fundamentals 3

**Sophomore Year**

**First Semester**

- Agron 201 Crop Gro Dev 2
- Bio S 103 Intro Biol 4
- Econ 201 Principles 4
- Ag 205 Human Rel 3
- Elective 3

**Second Semester**

- Ag M 201 Metals Shop 3
- A S 213 Nutrition 3
- Bio S 104 Intro Biol 4
- Ag Elective 3
- Ag M Elective 3
- Educ 300 Intro Field Exp 1

**Junior Year**

**First Semester**

- Ag M 312 Eng & Tract 3
- Educ 301 Educ Psych 4
- Soils 201 Soils 3
- Ag M Elective 3
- VTE 471 Student Organizations 2

**Second Semester**

- Ag Ec 540 Farm Mgmt 3
- Educ 402 Eval Lrn Sec 2
- Entom 340 Ag Entom 3
- Ag M 402 Meth and Mat 3
- Educ 358 Current Issues 2
- Ag M Elective 3
- Elective 3

**Senior Year**

(intercalendable semesters)

**First Semester**

- VTE 342 Methods of Ag 2
- Educ 403 Curriculum 3
- Soils 301 Management 2
- Ag Elective 2
- Elective 6

**Second Semester**

- VTE 407 Dir Tchg Ag 12
- VTE 440 Fdns VTE 3
- VTE 442 Prog Planning 2
- VTE 345 Safety 1
- Ag M 313 Sm Engine 1

**AGRICULTURAL RESOURCES—FORESTRY**

The schedule of studies is the same as in the Production option above except as follows:

**Sophomore Year**

**Second Semester**

- Ag M 201 Metals Shop 3
- Agron 101 Fld Crop 3
- Bio S 104 Intro Biol 4
- FRM 303 Conservation 3
- Ag Ec Elective 3
- Educ 300 Intro Field Exp 1

**Junior Year**

**First Semester**

- Ag M 402 Meth Mat Ag M 3
- Educ 301 Educ Psych 4
- Soils 201 Soils 3
- FRM 380 Wld Hab Mgmt 3
- VTE 471 Student Organization 2

**Second Semester**

- Educ 402 Eval Lrn Sec 2
- Entom 340 Ag Entom 3
- Educ 358 Current Iss 2
- FRM Elective 6
- Elective 3

**HORTICULTURE**

This option is the same as the Agricultural Resources option above except electives will be in horticulture; in addition, PI P 329 will be taken in the junior year.
PRODUCTION AGRICULTURE—BUSINESS
The schedule of studies is the same as in the Production option above with the following changes:

**Sophomore Year**

**Second Semester**  
Ag Ec 201 Econ Mgmt Ag 3  
Ag M 201 Metals Shop 3  
A S 213 Nutrition 3  
Bio S 104 Intro Biol 4  
Educ 300 Intro Field Exp 1

**Junior Year**

**First Semester**  
Soils 201 Soils 3  
B A 210 Business Law 3  
Educ 301 Educ Psych 4  
Ag Ec or B A Elective 3  
Agron Elective 3  
VTE 471 Student Organization 2

**Second Semester**  
Educ 402 Eval Lrn Sec 2  
Entom 340 Ag Entom 3  
Educ 358 Current Iss 2  
Ag Ec or B A Elective 6  
Ag M 402 Meth and Mat 3

The specific course requirement may be substituted with approval of the adviser. However, 45 hours in agriculture science are required for Vocational Certification. Agricultural courses numbered 101 may be substituted by courses within that department having higher course numbers.

HOME ECONOMICS EDUCATION
The course of study leads to the degree of Bachelor of Science in Home Economics. The program includes minimum requirements for both the Provisional Teaching Certificate and the Vocational Home and Family Life Education Certificate.

Home Economics Education faculty in the Department of Vocational Technical Education advise Home Economics Education undergraduate students in Home Economics.

The VTE professional courses required for Home Economics Education majors are VTE 343, 345/346, 440/441, 434.

See Home Economics Education for schedule of classes.

INDUSTRIAL TECHNOLOGY
Two types of programs lead to the degree of Bachelor of Arts in Industrial Technology. The first gives a broad and carefully planned preparation for students who intend to teach industrial technology in the public schools. It gives a prospective teacher a sequence of courses in many of the major industrial technical fields and comprehensive combinations of industrial technology and related fields. It also fulfills the requirements for the Provisional Certificate.

The second program prepares students for entrance into industrial or commercial activities such as manufacturing, construction, contracting, representing manufacturers, and the installation, maintenance, sales and service of industrial products.

**Schedule of Studies**

At least 40 of the total hours required for the bachelor’s degree in these programs must be upper-division courses.

**Industrial Technology (Teaching)**

**Freshman Year**

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<td>M E 101 Graphic Design</td>
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<td>Engl 101 Composition</td>
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<td>VTE 110 Foundations</td>
<td>2</td>
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<td>M E 210 Production Proc</td>
<td>4</td>
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<td>Ag M 201 Metals Shop</td>
<td>3</td>
</tr>
<tr>
<td>Science Elective (GUR)</td>
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<tr>
<td>VTE 222 Wood Tech</td>
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<td>VTE 322 Wood Tech</td>
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<td>Psych 101 or 102</td>
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<td>VTE 250 Metal Tech</td>
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<td>Spe 102 Pub Spkg</td>
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**Sophomore Year**

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<tr>
<td>VTE 325 Bldg Const</td>
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<td>VTE 220 Ed Design</td>
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<td>Chem 101 Intro</td>
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<td>Educ 301 Educ Psych</td>
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<td>VTE 486 Applied Lab Proc</td>
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**Junior Year**

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<td>VTE 333 Methods Tchg</td>
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<td>VTE 416 Auto Tech</td>
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<td>VTE 426 Graphics</td>
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### Department of Vocational Technical Education

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<td>Educ 358-359 Current Issues</td>
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<td>VTE 433 Lab Org &amp; Mgmt</td>
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#### Senior Year
(Interchangeable Semesters)

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<td>VTE 464 Metal Tech</td>
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<td>VTE 488 Curric Mat I Ed</td>
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#### Industrial Technology Option

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<td>Engl 101 Composition</td>
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<td>VTE 110 Foundations</td>
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<td>Hum Elective (GUR)</td>
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<td>VTE 222 Wood Tech</td>
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<td>Psych 101 or 102</td>
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<td>Ag M 201 Metals Shop</td>
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<td>VTE 250 Metal Tech</td>
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<td>Spe 102 Public Speaking</td>
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<td>Soc S Elective (GUR)</td>
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</tr>
<tr>
<td>Science Elective (GUR)</td>
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<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>VTE 220 I Ed Design</td>
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<tr>
<td>Ag M 331</td>
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<tr>
<td>Phys 101 General</td>
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<tr>
<td>VTE 322 Wood Tech</td>
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<td>Hum Elective (GUR)</td>
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<tr>
<td>Chem 101 Intro</td>
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<tr>
<td>VTE 425 Wood Tech III</td>
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<tr>
<td>Cpt S 200 or 201, 210</td>
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<tr>
<td>Econ 201 Contemp Econ</td>
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<tr>
<td>Mgt 201 Org &amp; Mgt</td>
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#### Sophomore Year

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<tbody>
<tr>
<td>VTE 325 Bldg Const</td>
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<tr>
<td>VTE 350 Metal Tech</td>
<td>3</td>
</tr>
<tr>
<td>B Law 210 Bus Law</td>
<td>3</td>
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<tr>
<td>Ag M 416 Mobile Hydr</td>
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<td>VTE 416 Auto Tech</td>
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<tr>
<td>VTE 426 Graphics</td>
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<td>Major Electives</td>
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#### Junior Year

<table>
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<tr>
<td>VTE 464 Metal Tech</td>
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<tr>
<td>VTE 333 Methods</td>
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<tr>
<td>Approved Technical Elective</td>
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<td>VTE 480 App Lab Pro</td>
<td>3</td>
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<tr>
<td>Accrg 230 Prin Accrg</td>
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<td>Psych 306 Industrial</td>
<td>3</td>
</tr>
<tr>
<td>VTE 486 Applied Lab Proc</td>
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</tbody>
</table>

### Preparation for Graduate Study

As preparation for work toward an advanced degree in Vocational Technical Education a student should complete a 30-hour major in the field and apply for a Master of Science degree in Vocational Technical Education.

### Description of Courses

For explanation see Index under "Symbols"

**VTE**

110 Foundations of Industrial Education and Technology 2 History, goals, methods, curriculum, contemporary programs, and professional organizations.

220 (272) Industrial Education Design 3 (1-6) Prereq M E 101; Ag M 201. Design fundamentals; techniques, materials, and tools employed in the fabrication of industrial products.

222 (121) Woodworking Technology I 3 (0-6) Prereq M E 101. Wood identification, design, and fabrication of wood products, basic finishing techniques and related materials.

230 (130) Electricity 3 (1-6) Electrical theory and construction practices relevant to contemporary technology and the needs of the teacher. Cooperative course taught at the University of Idaho.

250 Metal Technology I 3 (0-6) Prereq M E 210; VTE 220; Ag M 201. Design, research, planning, and construction utilizing arc, heliarc, gas welding, machine tools, bench metals, foundry, forging, and heat treatment.

322 (221) Woodworking Technology II 3 (0-6) Prereq VTE 222. Elements in nomenclature; operation of power equipment; working drawings, bill of materials, and routing procedures; use of jigs and fixtures.

325 Building Construction Technology and Practice 3 (2-3) Prereq VTE 222; M E 101.

330 (131) Electronics 3 (1-6) Prereq VTE 230. Advanced electronics concepts and device applications to electronic systems. Cooperative course taught at the University of Idaho.
333 Methods of Teaching Industrial Education 3 Prereq VTE 110.
342 Methods of Teaching Agriculture 2 For juniors and seniors. Prereq Educ 301.
343 Methods of Teaching Home Economics 2 or 3 Prereq Educ 305 or c//f; 18 hrs H E.
345 Industrial Safety and Hygiene 1 Safety and industrial hygiene principles; federal and state regulations. Required for vocational certification.
346 Industrial Safety and Hygiene 1 Same as VTE 345.
348 Metal Technology II 3 (1-4) Prereq Ag M 201; M E 210. Metal deposition and fusion fastening; oxyacetylene, tungsten inert gas (TIG), metallic inert gas (MIG); plasma arc and consumable electrode.
350 Metal Technology III 3 (0-6) Prereq Ag M 201; M E 210; VTE 250, 348. Product planning, designing, and fabrication incorporating mass production methodology; industrial organization, design setups, jigs, fixtures, fabrication, methods, cost accounting.
407 Directed Teaching, Agriculture V 8 (1-21) to 12 (1-33) May be repeated for credit. Prereq VTE 442; 342; senior standing; permission of department. Supervised teaching in public schools for agricultural education majors (full day for twelve weeks). Includes a 2-hour weekly seminar in problems of teaching.
416 Automotive Technology 3 (1-6) Prereq Ag M 331. Theory and practice related to recent automotive technology.
420 Student Evaluation Techniques 3 Application of basic statistical tools and evaluation procedures to student evaluation in the classroom; grading procedures; analysis and construction of object, subject, and performance tests. Cooperative course taught at the University of Idaho.
421 Vocational Guidance 3 Vocational guidance needs and objectives, principles and practices; organization and utilization of occupational information. Credit not granted for both VTE 421 and 521. Joint course taught with the University of Idaho.
425 Woodworking Technology III 3 (1-4) Prereq VTE 222, 322. Mass production methodology, industrial organizations, design, jig, fixture fabrication, cost accounting, marketing, product planning and fabrication.
426 Graphics Technology 3 (0-6) Prereq VTE 220. Industrial graphics; equipment setup, job production, and machine maintenance.
431 Career Education 2 Principles, organization, current practices, and program development.
433 Laboratory Organization and Management 3 (2-3) Prereq VTE 333. Planning, organizing, and management of technical laboratories and facilities; shop safety. (a/y)
434 Home Economics Education 2 Prereq VTE 343; c// in Educ 405 or 406. Organization and administration of vocational programs in home economics.
440 Principles of Vocational Education 2 or 3 Prereq 9 hrs Educ. Local, state, and national vocational technical educational legislation, policies, programs, and organizations.
441 Principles of Vocational Education 2 or 3 Same as VTE 440.
442 Program Planning in Agricultural Education 2 Prereq VTE 342. Organization and management of a total vocational agriculture program.
443 Identifying Vocational Special Needs Students 3 An orientation to the history and background of occupational special needs education; methods of assessment and evaluation. Cooperative course taught at the University of Idaho.
461 Occupational Analysis 2 Methods, techniques, and procedures in analyzing occupations and jobs into their basic elements. Cooperative course taught at the University of Idaho.
464 Metal Technology IV 3 (0-6) Prereq Ag M 201; M E 210; VTE 250, 348, 350. Advanced machining, welding, sheet metal, foundry, forging, and heat treatment.
470 Direct Work Experience 1-3 May be repeated for credit; cumulative maximum 6 hours. Job analysis and description; weekly work experience reports and analysis coordinated with problems related to the student's employment in an approved occupation.
471 Student Organizations 2 Role of student organization; organization and implementation of leadership activities. Cooperative course taught at the University of Idaho.
473 Vocational Education in Adult Education 3 Historical development, organi-
zation, instructional programs, public relations, physical plants and management. Credit not granted for both VTE 473 and 573. Joint course taught with the University of Idaho.

478 Career Development and Vocational Guidance for the Handicapped 3 Same as Educ 478.

481 Vocational Education Methods in Secondary School Education 3 Same as Educ 481.

486 Applied Industrial Laboratory Procedures V 1 (0-2) to 3 (0-6) May be repeated for credit; cumulative maximum 6 hours. Prereq VTE 222, 250, 333; Ag M 331. Introduction to applied industrial processes; construction of test apparatus; seminars.

488 (424) Curriculum Materials in Industrial Education 3 Prereq 12 hours VTE; VTE 333.

490 Instructional Practicum V 1-3 May be repeated for credit; cumulative maximum 6 hours.

497 Cooperative Vocational Education Programs 3 The role of cooperative vocational programs, organization and implementation. Credit not granted for both VTE 497 and 597. Joint course taught with the University of Idaho.

499 Special Problems V 1-4 May be repeated for credit.

501 Seminar in Vocational Education 1-3 May be repeated for credit; cumulative maximum 6 hours. Prereq 6 hrs VTE. Joint course taught with the University of Idaho.

504 Special Topics in Vocational Education 1-3 May be repeated for credit; cumulative maximum 6 hours. Joint course taught with the University of Idaho.

507 Foundations of Vocational Education 3 The interpretation of philosophical, social, and economic factors that influence vocational education. Cooperative course taught at the University of Idaho.


515 Instructional Strategies 3 Principles, concepts, and aims and application of teaching strategies.

521 Vocational Guidance 3 Graduate level counterpart of VTE 421; additional requirements. Credit not granted for both VTE 421 and 521.

531 Special Topics in Vocational Agriculture 1-3 May be repeated for credit; cumulative maximum 6 hours.

533 Special Topics in Distributive Education 1-3 May be repeated for credit; cumulative maximum 6 hours. Cooperative course taught at the University of Idaho.

534 Special Topics in Home and Family Life 1-3 May be repeated for credit; cumulative maximum 6 hours.

535 Special Topics in Industrial Education 1-3 May be repeated for credit; cumulative maximum 6 hours.

543 Administration and Supervision of Vocational Education 3 Theory and practice of administering and supervising vocational education programs. Joint course taught with the University of Idaho.

544 Modifying Vocational Programs for Students with Special Needs 3 A product oriented course aimed at developing skills of education teachers in developing courses for students with vocational special needs. Cooperative course taught at the University of Idaho.

545 Facility Planning 3 Principles and procedures in planning secondary and post-secondary vocational facilities.

555 Program Evaluation in Vocational Education 3 Principles and procedures used in program evaluation.

571 Accessing, Organizing, and Synthesizing Data 3 Latest techniques in accessing of data bases and repositories, practical exercises in the use of the computer in analyzing data for research projects. Cooperative course taught at the University of Idaho.

573 Vocational Education in Adult Education 3 Graduate level counterpart of VTE 473; additional requirements. Credit not granted for both VTE 473 and 573.

597 Cooperative Vocational Education Programs 3 Graduate level counterpart of VTE 497; additional requirements. Credit not granted for both VTE 497 and 597.

598 Internship V 1-3 May be repeated for credit; cumulative maximum 12 hours. Supervised experience in teacher education, administration, supervision or
auxiliary service in vocational education.

600 Special Projects or Independent Study Variable credit.
700 Master’s Research, Thesis, and/or Examination Variable credit.
702 Master’s Special Problems, Directed Study, and/or Examination Variable credit.

Program in Women Studies

Director, S. Armitage

The Program in Women Studies offers an interdisciplinary study of women, with an emphasis on their lives, roles, and contributions. The program is designed to achieve four major objectives.

(1) to provide students with a systematic knowledge of the multi-disciplinary literature concerning women;
(2) to enhance the qualifications of students preparing for careers in business, education, and the helping services;
(3) to facilitate the understanding of continuing social change in gender-related activities; and
(4) to further university and societal goals of sexual equality.

The program offers a minor in Women Studies. The minor requires a minimum of 16 hours of credit chosen from the list below, including: (1) a minimum of 8 hours at the 300-level and above; and (2) W St 200, Introduction to Women Studies.

Description of Courses

For explanation see Index under “Symbols”

W St
150 [S] Marital and Sexual Life Styles 3 Same as Soc 150.
200 [S] Introduction to Women Studies 3 Multidisciplinary perspectives on women and on their past, present, and potential contributions.
247 Human Development II 3 Same as CFS 247.
290 Women in the Workplace 2 Career and

life planning based on an understanding of the historical and contemporary situation of women in the workplace.

298 History of Women in American Society 3 Same as Hist 298.
301 Topics in Women Studies 2 or 3 May be repeated for credit; cumulative maximum 6 hours.
305 Women and Politics 3 Same as Pol S 305.
310 Women Artists in History 3 A historical study of women artists.
324 Psychology of Women 3 Same as Psych 324.
343 Sociology of Professions and Occupations 3 Same as Soc 343.
350 Decision Making in Families 3 Same as CFS 350.
351 [S] The Family 3 Same as Soc 351.
355 Women Writers 3 Same as Engl 355.
384 [S] Sociology of Sex Roles 3 Same as Soc 384.
398 History of Women in the American West 3 Same as Hist 398.
410 Racism and Sexism in Language 3 Same as For L 410.
450 Family and Socialization 3 Same as Soc 450.
499 Special Problems V 1-4 May be repeated for credit.

Department of Zoology


Zoology is the basic animal science. The courses offered in this department meet the needs of three groups of students; those who plan to specialize in general zoology, zoophysiology, or some other area of biological science; those who wish to study biological science for its cultural or educational value; and those who plan to enter an applied science such as medicine, pharmacy, dentistry, veterinary medicine, or wildlife biology.

There are adequate facilities for graduate study in environmental biology, development,
systematics, physiology, and wildlife biology.

Special facilities include the Vertebrate Collections of the Charles R. Conner Museum, George Hudson Biological Preserve, Electron Microscopy Center, and the Computer Center.

The department offers courses of study leading to the degrees of Bachelor of Science in Wildlife Biology, Bachelor of Science in Zoology, Master of Science in Wildlife Biology, Master of Science in Zoology, Doctor of Philosophy (Zoology) and Doctor of Philosophy (Zoophysiology).

Description of Courses

For explanation see Index under "Symbols"

Zool

135  [B] Animal Natural History 2 Identification, life history, and behavior of animals commonly found in the Pacific Northwest.

205  Evolution 2 For non-biology majors. Basic principles of Darwinian evolution. Credit not granted for both Zool 205 and 405. Not recommended for Life Sciences majors, except those in Biology Education Option.

224  Adaptive Strategies of Animals 3 Prereq Bio S 103. Animal structure, function, behavior, reproduction and life history as viewed from an adaptational perspective.

225  General Zoology Laboratory 1 (0-3) Invertebrate and vertebrate animals; structural features, adaptations, diversity and systematic relationships.

230  Renewable Resources Management 3 Prereq Bio S 104. History and concepts of natural resource management from a wildlife perspective.


310  Aquatic Ecology 3 (2-3) Prereq Zool 322. General ecology of fresh, marine, and brackish waters. (a/y)

315  Gross and Microanatomy 4 (3-3) Prereq 1 sem Bio S. Gross and microscopic anatomy of the human.


322  Invertebrate Biology 4 (3-3) Prereq Zool 224. Systematics, development and evolution of the invertebrate phyla.

324  Comparative Vertebrate Anatomy 4 (2-6) Prereq Zool 224. Evolution of vertebrates and their organ systems; correlation of structural modification with function.

328  Animal Population Dynamics 3 Prereq calculus; Bio S 104. Structure and dynamics of animal populations; theoretical and applied aspects of population ecology.


335  Fisheries Biology 3 (2-3) Prereq Bio S 104, Math 141 or 171. Identification, life history, population dynamics and management of important fish species. (a/y)

352  Principles of Zoophysiology 4 (3-3) Prereq Org Chem; Bio S 104. Function and control at the cell-tissue level.

353  Principles of Zoophysiology 4 (3-3) Prereq Org Chem; Bio S 104. Function and control at the organ-organismic level with emphasis on mammals.

390  Special Topics in Research Methods 2 (0-6) Prereq junior in Zool; Org Chem; Phys. May be repeated for credit; cumulative maximum 4 hours. Laboratory and field experience; research equipment and techniques.

393  Seminar 1 Prereq 16 hrs biology. Training in abstracting and reporting recent and classical research in zoology.


408  Introduction to Mathematical Biology 3 Prereq Math 141 or 171; 3 sem biology. Fundamental mathematical principles applied to the study of biological systems.

414  Fishery Ecology 2 (1-3) or 3 (2-3) Racial discrimination, migration, and spawning activities of salmonids; environmental stress with reference to physiology, competition, predation, and pollution. Field trip required. Cooperative course taught at the University of Idaho.

417  Parasitology 4 (3-3) Prereq Bio S 104.
Types of associations, life cycles, control, prevention, and modifications of parasites; examination of parasitic protozoa and helminths.

420 Microanatomy 4 (2-6) Prereq Zool 320. Microscopic analysis of selected cell types, tissue, and organ structure; organization, evolution, and function.


430 Biology of Amphibians and Reptiles 4 (3-3) Prereq Bio S 104. Characteristics and systematics; origins and phyletics; patterns of distribution; adaptive strategies; interactions between man and the lower vertebrates.

432 Wildlife Nutrition 3 (2-3) Prereq Org Chem. Nutritional requirements and interactions of wildlife populations. Credit not granted for both Zool 432 and 532.


438 Animal Behavior 3 (2-3) Prereq Zool 224. The biological study of animal behavior as viewed from ethological, genetic, developmental, ecological, and evolutionary perspectives.

440 Radiation Ecology 2 The fate and effect of radionuclides in the natural environment. (a.y)

448 Evolutionary Ecology of Populations 3 Prereq Zool 405; Bio S 372. Ecological and evolutionary factors influencing the life histories and the population structure and dynamics of plants and animals. Credit not granted for both Zool 448 and 548.

450 Cell Biology 3 Same as GenCB 450.

497 Instructional Practicum V 1-4 May be repeated for credit; cumulative maximum 6 hours. Academic traineeship in laboratory teaching and tutoring.

499 Special Problems V 1-4 May be repeated for credit.

501 Raptor Population Ecology 2 The natural history of North American raptorial birds; population dynamics and food habits. Cooperative course taught at the University of Idaho.

503 Workshop: Wildlife Topics 2 May be repeated for credit; cumulative maximum 10 hours. Prereq Zool 435. Selected topics in the conservation and management of wildlife. Cooperative course taught at the University of Idaho.

505 Generation, Degeneration, Regeneration in the Nervous System 2 Plasticity and specificity of neural connections of invertebrates and vertebrates. Cooperative course taught at the University of Idaho. (a/y)

506 Electron Microscope Laboratory 3 (0-9) Prereq 1 yr biology; 1 yr Org Chem; 1 yr Phys. By interview only. Techniques of transmission and scanning electron microscopy, especially those applicable to biological materials.

510 Invertebrate Ecology 3 (2-3) Prereq Zool 322. Adaptations of invertebrates to their environment. (a/y)

511 Principles of Systematic Biology 3 (2-3) Prereq Bio S 103, 104; 10 additional hrs Zool. Principles, methods, and literature of systematic biology; speciation mechanisms; concepts and problems of species and higher taxa; codes of nomenclature. (a/y)

512 Limnology 3 (2-3) Chemical, physical, and biological characteristics of inland waters. Field trip required. (a/y)

513 Advanced Fishery Management 3 Compensation as a phenomenon basic to exploitation; yield in numbers and weight; models of yield; stock recruitment functions: economic yield. Field trip required. Cooperative course taught at the University of Idaho. (a/y)

527 Radioactive Tracer Techniques 2 (1-3) Use of radioisotopes in biological research.

530 Statistical Ecology 3 Prereq 3 hrs Biom Collection and interpretation of ecological data according to biometrical procedures. (a/y)

531 Mathematical Ecology 3 Prereq course in calculus; 6 hrs Zool, Bot, or Biol. Mathematical methods in the study of population and community ecology.

532 Wildlife Nutrition 3 (2-3) Graduate level counterpart of Zool 452; additional requirements. Credit not granted for both Zool 432 and 532.

544 Big Game Management 3 Prereq Zool 435. Big game species and their populations and habitats; objective balance
of the components of habitats with population levels. Cooperative course taught at the University of Idaho.

546 Upland Game Ecology 2 Prereq Zoology 435. Ecology and management of wildlife species using forest and rangeland habitats; current management problems and procedures. Cooperative course taught at the University of Idaho. (a/y)

548 Evolutionary Ecology of Populations 3 Graduate level counterpart of Zoology 448; additional requirements. Credit not granted for both Zoology 448 and 548.

552 Comparative Physiology 4 (3-3) Prereq Zoology 322, 352 or 353; 8 additional hrs Bio S or Ph S. Mechanisms of basic functions in the important animal phyla. (a/y)

553 Comparative Neurophysiology and Endocrinology 4 (3-3) Prereq Zoology 224, 225; Zoology 352 or 353. Comparison of control mechanisms in invertebrate and vertebrate systems. (a/y)


555 General and Cellular Physiology 4 (3-3) Prereq Org Chem; Math 171; Phys 102; Bio S 104. Physicochemical mechanisms of cellular function. (a/y)

557 Advanced Vertebrate Physiology 4 (2-6) Prereq BC/BP 364; Zoology 353 or V Ph 318. Principles of vertebrate physiology illustrated through contemporary analytical and instrumental procedures. (a/y)

560 Environmental Physiology 3 Prereq Zoology 353, V Ph 420, or A S 403. Physiological modes of adaptation of vertebrates to their temporal and physical environments.

561 Laboratory in Environmental Physiology 1 (0-3) Prereq Zoology 560 or C/. Measuring physiological response to environmental variation.

573 Cellular and Molecular Aspects of Development 3 Prereq Zoology 320, BC/BP 364, or GenCB 450. Current biochemical and ultrastructural research in developmental biology. (a/y)

574 Experimental Analysis of Development 2 (0-6) Prereq Zoology 320 or 573 or C/. Experiments on sea urchin, amphibian and chicken embryos; tissue culture techniques in developmental biology. (a/y)

588 Advanced Topics in Wildlife 1-3 May be repeated for credit; cumulative maximum 10 hours. Biology and management of wildlife species.

589 Advanced Topics in Zoology I 2 May be repeated for credit; cumulative maximum in Zoology 589, 590, 591—10 hours. Recent advances in zoology.

590 Advanced Topics in Zoology II 2 May be repeated for credit; cumulative maximum in Zoology 589, 590, 591—10 hours. Recent advances in zoology.

591 Advanced Topics in Zoology III 2 May be repeated for credit; cumulative maximum in Zoology 589, 590, 591—10 hours. Recent advances in zoology.

592 Advanced Topics in Cell Biology 1-3 May be repeated for credit; cumulative maximum 10 hours. Same as GenCB 592.

593 Seminar 1 May be repeated for credit. Prereq 20 hrs Zoology. Literature and problems.

597 Teaching Practicum 1 Zoology laboratory teaching internship.

598 Colloquium 1 May be repeated for credit.

600 Special Projects or Independent Study Variable credit.

700 Master's Research, Thesis, and/or Examination Variable credit.

702 Master's Special Problems, Directed Study, and/or Examination Variable credit.

800 Doctoral Research, Dissertation, and/or Examination Variable credit.

Schedule of Studies

At least 40 of the total hours required for the bachelor's degree in these programs must be in upper-division courses. A candidate for the bachelor's degree must fulfill the graduation requirements of the College of Sciences and Arts and the general departmental requirements for graduation.

ZOLOGY OPTION

Students interested in preparing for professional or graduate work should follow this option.

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<td>Engl 201 or 301 or 402</td>
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<td>Chemistry, including Organic</td>
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<tr>
<td>Physics</td>
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<tr>
<td>Math 107, 171</td>
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Math 172 or Biom 412 or Zool 408 3-4
Cpt S 2
Foreign Language—two semesters in one language at the college level or two years in high school or the intensive summer course. 8
Bio S 103, 104 8
Bot 320 or 332, or Bact 201 3-5
GenCB 301 3
Zool 224, 225 4
Zool 320 4
Zool 310 or 330 or Bio S 372 3-4
Zool 322 or 324 4
Zool 352 or 353 or Bio S 305, 306 4
Zool 393 1
Zool 405 2
One from Zool 335, 417, 423, 428, 430, Entom 434, 448 3-4
Electives, General University and College of Sciences and Arts Requirements 30-35

TOTAL 120

CAREER-ORIENTED OPTIONS

The department also offers the bachelor's degree with a concentration in one of four career-oriented options, each designed for specific areas of the job market: biomedical sales, animal supervision, biomedical computation, and microstructure and analytical methods. The core courses listed below are required for all four options; additional requirements are specified under each option.

Core Courses—90 hours

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<th>Course</th>
<th>Hours</th>
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<tr>
<td>Arts, humanities, social sciences</td>
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<tr>
<td>Foreign Language (or 2 yrs in HIS)</td>
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<tr>
<td>Engl 101, 402</td>
<td>6</td>
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<tr>
<td>Spe 102 Public Speaking</td>
<td>3</td>
</tr>
<tr>
<td>Phys 101, 102</td>
<td>8</td>
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<td>Chem 105, 106, 107, 240</td>
<td>13</td>
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<tr>
<td>Math 107, 171</td>
<td>7</td>
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<tr>
<td>Bio S 103, 104</td>
<td>8</td>
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<tr>
<td>Zool 224, 225</td>
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<tr>
<td>Zool 390 Research Methods</td>
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<td>Zool 393 Seminar</td>
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<td>Zool 398 Summer Internship</td>
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<td>Zool 499 Senior Project</td>
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Total core 89

1. BIOMEDICAL COMPUTATION—44-45 hours

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<tr>
<td>Math 172, 220</td>
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<tr>
<td>Cpt S 150, 151, 154, 260, 330, 335, and 432 or 435</td>
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<tr>
<td>Stat 429 Probability</td>
<td>3</td>
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<tr>
<td>Biom 412 Biometry</td>
<td>3</td>
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Biol 320, 322, 324, or 315 4
Zool 310, 330, or Bio S 372 3-4
Zool 352, 353, or 450 4
Zool 408 Math Biology 3

2. MICROSTRUCTURE AND ANALYTICAL METHODS—36-37 hours

<table>
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<th>Course</th>
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<tr>
<td>Chem 217 Quant Analysis</td>
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<tr>
<td>BC/BP 364, 366</td>
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<tr>
<td>Phys 410</td>
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<tr>
<td>Zool 320, 322, or 324</td>
<td>4</td>
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<tr>
<td>Zool 420 or 450</td>
<td>4-5</td>
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<tr>
<td>Zool 506 Electron Mic Lab</td>
<td>3</td>
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<td>Zool 352 or 353</td>
<td>4</td>
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<tr>
<td>Zool 427 Radioactive Tracer Tech</td>
<td>2</td>
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<tr>
<td>Bact 201 Microbiology</td>
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<tr>
<td>GenCB 301 Genetics</td>
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3. BIOMEDICAL SALES—42-43 hours

<table>
<thead>
<tr>
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<tr>
<td>Bact 101 Bacteriology</td>
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<tr>
<td>BC/BP 364 Biochemistry</td>
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<td>Phys 410 Electronics</td>
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<td>Cpt S 150, 151</td>
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<td>QMeth 215 Statistics</td>
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<td>Mktg 360 Marketing</td>
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<td>Mktg 477 Promotion Mgr</td>
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<tr>
<td>Phar 301 or 467</td>
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<tr>
<td>V Ph 421 Veterinary Pharm</td>
<td>4</td>
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<tr>
<td>GenCB 301 Genetics</td>
<td>3</td>
</tr>
<tr>
<td>Zool 315 Gross/Micro Hum Anat</td>
<td>4</td>
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<tr>
<td>Zool 353 Vertebrate Phys</td>
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</tr>
</tbody>
</table>

4. ANIMAL SUPERVISION—40 hours

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC/BP 364, 366</td>
<td>4</td>
</tr>
<tr>
<td>Phar 301 Pharmaceutics</td>
<td>4</td>
</tr>
<tr>
<td>V Ph 421 Veterinary Pharm</td>
<td>4</td>
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<tr>
<td>Zool 324 Comp Vertebrate Anat</td>
<td>4</td>
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<tr>
<td>Zool 353 Vertebrate Phys</td>
<td>3</td>
</tr>
<tr>
<td>Zool 432 Wildlife Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>Zool 417 Parasitology</td>
<td>3</td>
</tr>
<tr>
<td>Zool 438 Animal Behavior</td>
<td>3</td>
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<tr>
<td>Bact 101 Bacteriology</td>
<td>4</td>
</tr>
<tr>
<td>VMS 261 Accidents and Diseases</td>
<td>3</td>
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<tr>
<td>A S 366 or GenCB 301</td>
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</tr>
</tbody>
</table>

WILDLIFE BIOLOGY OPTION

<table>
<thead>
<tr>
<th>Course</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ag Ec 201</td>
<td>3</td>
</tr>
<tr>
<td>BC/BP 364</td>
<td>3</td>
</tr>
<tr>
<td>Biom 310 or 412</td>
<td>3</td>
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<tr>
<td>Bio S 103, 104</td>
<td>8</td>
</tr>
<tr>
<td>Bot 332, 462</td>
<td>7</td>
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<tr>
<td>Chem 105, 106, 107, 240</td>
<td>13</td>
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<tr>
<td>Cpt S 150 plus 151, 152, 153, or 154</td>
<td>4</td>
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<tr>
<td>Engl 201, 301, or 402</td>
<td>3</td>
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<tr>
<td>Entom 343</td>
<td>3</td>
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<tr>
<td>GenCB 301</td>
<td>3</td>
</tr>
<tr>
<td>Math 107, 171, or 140, 141</td>
<td>7-8</td>
</tr>
<tr>
<td>V Mic 435</td>
<td>3</td>
</tr>
</tbody>
</table>
Zool 224, 230, 324, 328, 353, 432, 435, 436, 438, and 423 or 428  34

Two courses from two different areas
from Phys 101, 102; Geol 102; Soils 201; Ch E 174  6-8

Electives, General University and College of Science and Arts Requirements  27-30

TOTAL  130

The core requirements plus electives meet U.S. Civil Service requirements for wildlife biology, wildlife refuge management, general biology, and zoology.

Through judicious use of electives, the student can also meet additional Civil Service requirements for fish biology, range conservation, and soil science.

**Minor in Zoology**
Requires a minimum of 16 hours to include Zool 224, 225 and 320 or 322 or 324; 8 additional hours of zoology, 6 of which must be upper-division. Not more than 2 hours of Zool 499 may be included in the 16 hours.

**Minor in Wildlife Biology**
Requires a minimum of 24 hours to include Zool 230, 328, 432, 435, 436, and 7 additional hours of Zoology and/or Botany.
Alphabetical Listing
for 1983-85 Catalog

A
Academic Calendar 2
Academic Complaints 29
Academic Deficiency 30
Academic Regulations 23
Accounting and Business Law 108
Accreditation 7
Activities Center 9
Administrative Officers 5
Admission 19
Advance Payment 21
Credit by Examination 22
Foreign Student 20
Former Student Returning 21
Freshmen 19
Graduate 55
Major, Selection of 21
Limited Enrollment 20
Persons Age 60 and Over 42
Reentry Advisory Program 11
Transfer Student 20
Adult and Continuing Education 69
Advertising 139
Advisory Program 21
Aerospace Studies 70
Aging 71
Agricultural Communications 142, 203
Agricultural Economics 71
Agricultural Education 312
Agricultural Engineering 75
Agricultural Mechanization 78
Agriculture and Home Economics, College of 46
Agriculture, General 202
Agronomy 80
American Studies 83
Animal Sciences 84
Anthropology 87
Architecture 92
Architectural Studies 96
Construction Management 96
Art 184
Asian American Studies 97
Asian Studies 150
Assistantships 58
Astronomy 98
Auditing 23

Board and Room 37, 43
Board of Regents 4
Botany 106
Broadcasting 140
Business Administration 108
Business, Departments of 108
Business and Economics, College of 49
Business Law 108

C
Calendar 2
Campus 7
Career Services and Placement Center 11
Certificates 35, 155
Certification of Major 25
Chemical Engineering 115
Chemical Physics 119
Chemistry 120
Chicano Studies 125
Child and Family Studies 126
Chinese 191
Cinema 140
Civil and Environmental Engineering 129
Classical Studies 205
Classics 191
Classification of Students 25
Clothing, Interior Design and Textiles 135
Clubs 8
Colleges
Agriculture and Home Economics 46
Business and Economics 49
Education 51
Engineering 53
Pharmacy 62
Sciences and Arts 63
Veterinary Medicine 65
Communication Proficiency, GURs 32
Communications Disorders Clinic 10
Communications 139
Comparative American Cultures 143
Computer Science 144
Computing Service Center 16
Concerts 12
Construction Management 96
Continuing University Studies 8
Correspondence Courses 8
Counseling Services 11
Courses
Numbering System 25
Prerequisites 24
Repeat 28
Courses and Curricula 69
Credentials, Administrators 156
Credit 23
By Examination 22
Repeat for 28
<table>
<thead>
<tr>
<th>J</th>
<th>Pharmacy, College of 62, 265</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japanese 194</td>
<td>Philosophy 268</td>
</tr>
<tr>
<td>Joint Center for Graduate Study 59</td>
<td>Physical Education 269</td>
</tr>
<tr>
<td>Journalism 140</td>
<td>Physical Metallurgy 238</td>
</tr>
<tr>
<td>L</td>
<td>Physical Science, GURs 32</td>
</tr>
<tr>
<td>Landscape Architecture 222</td>
<td>Physically Impaired Student Services 10, 40</td>
</tr>
<tr>
<td>Liberal Arts 206</td>
<td>Physics 277</td>
</tr>
<tr>
<td>Libraries 13</td>
<td>Placement Center 11</td>
</tr>
<tr>
<td>Library Science 163</td>
<td>Planetarium 15</td>
</tr>
<tr>
<td>Linguistics 206</td>
<td>Plant Pathology 280</td>
</tr>
<tr>
<td>Literary Studies 236</td>
<td>Political Science 282</td>
</tr>
<tr>
<td>Living Facilities 43</td>
<td>Predental Curriculum 289</td>
</tr>
<tr>
<td>Loans 40</td>
<td>Prelaw 287</td>
</tr>
<tr>
<td>M</td>
<td>Premajor 21</td>
</tr>
<tr>
<td>Major</td>
<td>Premedical Curriculum 289</td>
</tr>
<tr>
<td>Certification of 25</td>
<td>Prerequisites 25</td>
</tr>
<tr>
<td>Selection of 21</td>
<td>Preveterinary Medicine 306</td>
</tr>
<tr>
<td>Management and Administrative Systems 108</td>
<td>Psychology 290</td>
</tr>
<tr>
<td>Marketing 111</td>
<td>Public Relations 141</td>
</tr>
<tr>
<td>Married Student Housing 44</td>
<td>Pure and Applied Mathematics 240</td>
</tr>
<tr>
<td>Materials Science and Engineering 236</td>
<td>Q</td>
</tr>
<tr>
<td>Mathematics 240</td>
<td>Quantitative Methods 112</td>
</tr>
<tr>
<td>Statistics 243</td>
<td>R</td>
</tr>
<tr>
<td>Mechanical Engineering 245</td>
<td>Radio-Television Services 14</td>
</tr>
<tr>
<td>Medical Sciences 249</td>
<td>Range Management 196</td>
</tr>
<tr>
<td>Metallurgy 238</td>
<td>Reading Center 156</td>
</tr>
<tr>
<td>Military Science 250</td>
<td>Real Estate 113</td>
</tr>
<tr>
<td>Minor, Departmental 26</td>
<td>Records, Student Access to 30</td>
</tr>
<tr>
<td>Museums 15</td>
<td>Recreation and Leisure Studies 269</td>
</tr>
<tr>
<td>Music 252</td>
<td>Recreational Facilities 9</td>
</tr>
<tr>
<td>Concerts 12</td>
<td>Re-entry Advisory Program 11</td>
</tr>
<tr>
<td>Performance Groups 12</td>
<td>Refund Policy 40</td>
</tr>
<tr>
<td>N</td>
<td>Regional Planning 180</td>
</tr>
<tr>
<td>Native American Studies 258</td>
<td>Registration 23</td>
</tr>
<tr>
<td>Naval Science 259</td>
<td>Fees 37</td>
</tr>
<tr>
<td>Nonresidents 39</td>
<td>Regulations, General 23</td>
</tr>
<tr>
<td>Nuclear Radiation Center 14</td>
<td>Religious Studies 206</td>
</tr>
<tr>
<td>Numbering System of Courses 24</td>
<td>Repetition of Courses 28</td>
</tr>
<tr>
<td>Nursing 60, 260</td>
<td>Residence Halls 43</td>
</tr>
<tr>
<td>Spokane Center 60, 260</td>
<td>Resident Status 39</td>
</tr>
<tr>
<td>Nutrition 263</td>
<td>Retention 19</td>
</tr>
<tr>
<td>O</td>
<td>Richland, Joint Center for Graduate Study 59</td>
</tr>
<tr>
<td>Observatory 15</td>
<td>ROTC 70, 250</td>
</tr>
<tr>
<td>OCUS 8</td>
<td>Russian 194</td>
</tr>
<tr>
<td>Office of Programs for Women 11</td>
<td>S</td>
</tr>
<tr>
<td>Officers of the University 5</td>
<td>Scholarships 40</td>
</tr>
<tr>
<td>P</td>
<td>Scholastic Societies 8</td>
</tr>
<tr>
<td>Pass-Fail 28</td>
<td>Sciences, GURs 32</td>
</tr>
<tr>
<td>Pest Management 202</td>
<td>Sciences and Arts, College of 63</td>
</tr>
<tr>
<td>Pharmacology/Toxicology 264</td>
<td>Graduation Requirements 32</td>
</tr>
<tr>
<td></td>
<td>Science Supportive Services 10</td>
</tr>
<tr>
<td></td>
<td>Semester Hours 23</td>
</tr>
<tr>
<td></td>
<td>Social Sciences, GURs 32</td>
</tr>
</tbody>
</table>
Social Research Center 15
Social Studies 219
Social Work 297
Sociology 294
Soils 299
Spanish 194
Speech 302
  Communications Disorders 10, 305
  Theatre Arts 12, 305
Speech Communication 141
Statistics 243
Student
  Classification of 25
  Counseling Services 11
  Government 9
  Health Service 10
  Housing 43
  Identification Card 23
  Loans 40
  Publications 9
  Records, Access to 30
  Union Building 9
Study Abroad Program 12
Summer Session 7
Swedish 195
Symbols 69

T
Teaching Certificates 155
Teaching Majors and Minors 164
Theatre 12
Transcripts 27
Transfer Student Admission 20
  Also see department
Tuition 37

V
Veterans Benefits 41
Veterinary and Comparative Anatomy,
  Pharmacology and Physiology 307
Veterinary Clinical Medicine and
  Surgery 309
Veterinary Medicine, College of 65, 306
Veterinary Microbiology and Pathology 310
Veterinary Science 306
Vocational Technical Education 312

W
WSU Foundation 40
Wildland Recreation 201
Wildlife Biology 322
Withdrawal from the University 23
Women Studies 318

Z
Zoology 318